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MISSION STATEMENT

New York City College of Technology is a baccalaureate and associate degree-granting institution committed to providing broad access to high quality technological and professional education for a diverse urban population. City Tech's distinctive emphasis on applied skills and place-based learning built upon a vibrant general education foundation equips students with both problem-solving skills and an understanding of the social contexts of technology that make its graduates competitive. A multi-disciplinary approach and creative collaboration are hallmarks of the academic programs. As a community City Tech nurtures an atmosphere of inclusion, respect, and open-mindedness in which all members can flourish.

EDUCATION GOALS

As a result of a City Tech education, students will:

- Develop knowledge from a range of disciplinary perspectives, and hone the ability to deepen and continue learning.
- Acquire and use the tools needed for communication, inquiry, analysis, and productive work.
- Work productively within and across disciplines.
- Understand and apply values, ethics, and diverse perspectives in personal, professional, civic, and cultural/global domains.

Accreditation

New York City College of Technology is fully accredited by the Board of Regents of the University of the State of New York, the Middle States Commission on Higher Education, (3624 Market Street, Philadelphia, PA 19104, 267-284-5000), the Council of Standards for Human Services Education (CSHSE) and the Accreditation Commission for Programs in Hospitality Administration (ACPHA). In addition, programs are accredited by the Commission on Dental Accreditation of the American Dental Association (ADA), Commission of the American Bar Association's Standing Committee on Legal Assistants (ABA), Joint Review Committee on Education in Radiologic Technology (JRCERT), the Accreditation Commission for Education in Nursing (ACEN), the Engineering Technology Accreditation Commission of the Accreditation Board for Engineering Technology (ETAC/ABET), the Commission on Opticianry Accreditation and the National Council for Accreditation of Teacher Education (NCATE).

NOTA BENE

This issue of the catalog is published for academic years 2017-2018. Students should read the Schedule of Classes each term for the College calendar, changes in College requirements, new course offerings and other announcements.

Students are advised to consult regularly with College and department counselors concerning their programs of study. Changes after the publication date of this catalog will be found in the online version, <http://www.citytech.cuny.edu/academics/academic-catalog.aspx>, which should be regarded as the legal document of record.

The City University of New York reserves the right, because of changing conditions, to make modifications of any nature in the academic programs and requirements of the University and its constituent colleges without advance notice. Tuition and fees set forth in this publication are similarly subject to change by the Board of Trustees of The City University of New York. The City University regrets any inconvenience this may cause.

The college reserves the right to deny admission to any student if in its judgment, the presence of that student on campus poses an undue risk to the safety or security of the college or the college community. That judgment will be based on an individualized determination taking into account any information the college has about the crime committed by the student and the particular circumstances of the college, including the presence of a child care center, summer camp, public school or public school students on the campus. In addition, the college may consider factors such as the amount of time since the crime was committed, the amount of jail time served by the student, the number of years the student was on probation or parole, whether the student has satisfied probation or parole requirements at the time of the student's application, whether the student has completed drug, alcohol, sex offender or other treatment, and what work or educational experience the student has had after the conviction. Finally, if the student is known to have been assisted by a CUNY-sponsored or other re-entry program or initiative, the college will consult with a counselor or representative from said program.

Table of Contents

Click on a topic to jump to the page

- » *Mission Statement*
- » *Education Goals*
- » *Accreditation*
- » *This is City Tech*
- » *The City Tech Foundation*
- » *The Alumni Association*
- » *Admissions*
- » *CUNY Testing and Placement*
- » *Tuition and Fees*
- » *Financial Aid*
- » *Scholarships*
- » *Registration, Grades and Records*
- » *Degree Requirements*
- » *General Education/Core Curriculum and Pathways*
- » *Academic Standards, Policies and Procedures*
- » *Listing of Academic Programs*
- » *Academic Services and Special Programs*
 - » *Accelerated Study in Associate Programs (ASAP)*
 - » *Atrium Learning Center*
 - » *The CUE Initiative*
 - » *Theatreworks*
 - » *Grace Gallery*
 - » *The Ursula C. Schwerin Library*
- » *Division of Continuing Education*
- » *Collaborative Precollege Programs*
 - » *Office of Collaborative Precollege Programs*
 - » *Brooklyn Educational Opportunity Center (SUNY Brooklyn EOC/BEOC)*
- » *Office of Student Affairs*
- » *Special Programs*
 - » *The CUNY EDGE Program*
 - » *The SEEK Program*
 - » *The Center for Student Accessibility*
- » *Counseling and Student Services*
 - » *Counseling Services Center*
 - » *Information Desk*
 - » *The New Student Center*
 - » *Office of Student Recruitment*
 - » *Our Children's Center*
 - » *Student Wellness Center*
 - » *Veteran Services Counseling*
- » *Student Life and Development*
 - » *Office of Student Life and Development*
 - » *Athletics, Intramurals and Recreation*
- » *Important Policies and Procedures*
 - » *General Information*
 - » *Student Information*
 - » *Student Disciplinary*
- » *Campus Services and Facilities*

DEPARTMENTS AND PROGRAMS

» **Library**

» **SCHOOL OF ARTS AND SCIENCES**

» **African American Studies**

» **Biological Sciences**

Biomedical Informatics / BS

» **Chemistry**

Chemical Technology / AS

Applied Chemistry / BS

» **English**

Professional and Technical Writing / BS

Writing, Literature, Developmental Reading and Writing,
English as a Second Language

» **Humanities**

Art History, Music Theory/Appreciation, Study of Languages
(American Sign Language, Arabic, Chinese, French and Spanish),
Latin American Studies, Performing Arts, Speech and Theatre

» **Interdisciplinary Courses**

» **Liberal Arts and Sciences Programs**

Liberal Arts / AA

Liberal Arts and Sciences / AS

» **Mathematics**

Computer Science / AS

Applied Mathematics / BS

Mathematics Education / BS

» **Physics**

Applied Computational Physics / BS

» **Social Science**

Anthropology, Economics, Geography, Government,
History, Philosophy, Psychology, Sociology

» **SCHOOL OF PROFESSIONAL STUDIES**

» **Business**

Accounting / AAS

Marketing Management and Sales / AAS

Business and Technology of Fashion / AS

Business and Technology of Fashion / BS

» **Career and Technology Teacher Education**

Career and Technical Teacher Education / BS in Ed

Technology Teacher Education / BS in Ed

Click on a topic to jump to the page

» **Dental Hygiene**

Dental Hygiene / AAS

» **Health Services Administration**

Health Services Administration / BS

» **Hospitality Management**

Hospitality Management / AAS

Hospitality Management / BTech

» **Human Services**

Human Services / AAS

Human Services / BS

» **Law and Paralegal Studies**

Legal Assistant Studies / AAS

Legal Assistant Studies / BS

» **Nursing**

Nursing / AAS

Nursing / BS

» **Radiologic Technology and Medical Imaging**

Radiologic Technology / AAS

Radiological Science / BS

» **Restorative Dentistry**

Dental Laboratory Technology / AAS

» **Vision Care Technology**

Ophthalmic Dispensing / AAS

» **SCHOOL OF TECHNOLOGY AND DESIGN**

» **Architectural Technology**

Architectural Technology / AAS

Architectural Technology / BTech

» **Communication Design**

(formerly Advertising Design and Graphic Arts)

Communication Design / AAS

Communication Design / BTech

» **Computer Engineering Technology**

Electromechanical Engineering Technology / AAS

Engineering Technology / BTech

» **Computer Systems Technology**

Computer Information Systems / AAS

Microcomputer Business Systems / AAS

Computer Systems / BTech

» **Construction Management and Civil Engineering Technology**

Civil Engineering Technology / AAS

Construction Management Technology / AAS

Construction Engineering Technology / BTech

Construction Management / Certificate

» **Electrical and Telecommunications Engineering Technology**

Electrical Engineering Technology / AAS

Electrical Technology / BTech

Telecommunications Engineering Technology / AAS

Telecommunications Engineering Technology / BTech

» **Entertainment Technology**

Emerging Media Technology / BTech

Entertainment Technology / BTech

» **Environmental Control Technology**

Environmental Control Technology / AAS

Facilities Management / BTech

» **Mechanical Engineering Technology**

Mechanical Engineering Technology / BTech

Mechanical Engineering Technology / AAS

Industrial Design Technology / AAS

» *Administration*

» *Division of Continuing Education*

» *Faculty*

» *Emeriti Faculty*

» *College Laboratory Technicians*

» *Advisory Commissions*

» *Participating Agencies*

» *Clinical Associates*

» *Information on Certificate Programs Offered at
New York City College of Technology*

This is City Tech

Since its founding in 1946 as the New York State Institute of Applied Arts and Sciences, New York City College of Technology has served the citizens of New York and beyond. Offering a host of new and innovative programs, City Tech remains a pioneering force in higher education, preparing its students for tomorrow's careers and for a lifetime of growth and change.

Known informally as City Tech, we are the college of technology of The City University of New York. We enroll more than 17,000 students in 66 baccalaureate, associate and certificate programs in the technologies of art and design, business, computer systems, engineering, entertainment, health care, hospitality, human services, the law-related professions, career and technology teacher education, and the liberal arts and sciences. [Click here](#) for a full list of programs.

- The College also reaches about 15,000 students annually through its Division of Continuing Education and External Partnerships. City Tech programs are designed to anticipate emerging employment trends in the city, state, and nation, and the College has been identified by the Center for an Urban Future as a "leading engine of workforce development" within New York. Current Continuing Education offerings can be found at <http://www.citytech.cuny.edu/continuinged/>
- City Tech is located at the foot of the Brooklyn Bridge, adjacent to the Metro Tech Center academic and commercial complex. The campus is a two-minute walk from bus and subway lines serving the Downtown Brooklyn area.
- City Tech offers a distinctive combination: specialized technical instruction and a strong general education in the liberal arts and sciences. This curriculum helps students prepare for challenging, high-level professional opportunities, not merely for technical jobs. It also prepares students to be lifelong learners.
- Many City Tech programs are unique within CUNY and some are offered nowhere else in the New York City area; among them are the degree programs in Restorative Dentistry and in Entertainment Technology. Graduates of one of our newest programs, a Bachelor of Science in Professional and Technical Writing, will meet an urgent need for writers with an understanding of technology. Our connections with business and industry allow us to anticipate the needs of the future rather than to chase after them.
- City Tech's caring, committed faculty work side by side with students, fostering a strong sense of community. More of the teaching space of the College is devoted to specialized labs than to general purpose classrooms, a rare arrangement but one that allows the College to provide students with both theory and hands-on experience.
- Many faculty members have a professional background outside of academia, providing students with the benefit of extensive real-world experience. Their close ties to industry often lead to student internships and permanent employment.
- City Tech offers a diverse, multicultural learning environment. Students and faculty members come from more than 120 countries and speak more than 80 languages.
- The College is an active partner in the renaissance of Downtown Brooklyn and, especially, the emerging Brooklyn Tech Triangle, which looks to City Tech for the highly skilled workforce it requires. A strong program of internships and professional preparation serves students well in creating excellent career paths.
- Students find it easy to reinforce academic skills and gain career experience through business and community assistance programs and research opportunities at prestigious national science laboratories.

- A City Tech degree is a passport to success! The College has produced more than 90,000 graduates; many have remained in the greater New York area and contribute to its economic and professional vitality. Many alumni are nationally known in their fields, and more than 1,000 graduates are or have been corporate CEOs or business owners.
- Innovative programs in the Division of Continuing Education and External Partnerships help meet students' specific training and retraining needs and provide businesses with employees who have strong technical and management skills. For example, the unique Academy for Construction Education and Safety addresses an urgent New York City need for construction workers and managers with the skills to prevent avoidable accidents and meet mandated safety standards in construction.

The College frequently asks, "Where can technology take you?" The answer is clear: to an ideal mix of specialized skills and broad general education that will give you an edge in an increasingly competitive world, to a rewarding career, to the fulfillment that comes from knowing that you are pursuing your dreams.

The City Tech Foundation

Jewel Escobar, Executive Director
Suite 600
16 Court Street
Brooklyn, NY 11201
Phone: 718.260.5025
email: jescobar@citytech.cuny.edu

The City Tech Foundation is a 501(c)(3) not-for-profit corporation chartered in 1981 under the laws of the State of New York. It is charged with the solicitation and acceptance of gifts to the College in support of the college's educational mission and programs. In addition to raising in excess of one million dollars per year for a variety of student scholarships and other financial assistance programs, the foundation has secured a million dollars more in recent years in donated equipment to enhance both the educational and operational activities of the College. It has also helped to acquire resources to outfit the College's engineering and computer laboratories, learning centers and library, and has provided special incentives to attract and retain top-flight faculty. It maintains a special student revolving loan fund to help cover the cost of textbooks and other educational essentials so that no student's education need suffer for want of basic learning tools. The foundation also channels scholarship aid from private philanthropic and corporate supporters.

The Alumni Association

Jessica Malavez, Director
Suite 600
16 Court Street
Brooklyn, NY 11201
Phone: 718.260.5006
Fax: 718.254.8553
Website: www.citytech.cuny.edu/alumni

Graduates and former students as well as current students are welcome and encouraged to become involved in The City Tech Alumni Association. The association sponsors career development and other workshops and seminars for both graduates and current students.

Admissions

The Office of Admissions
Alexis Chaconis, Director
New York City College of Technology
Namm Hall, room N/G 17
300 Jay Street
Brooklyn, NY 11201
Phone: 718.260.5250
email: admissions@citytech.cuny.edu

INFORMATION

For pre-admission counseling, application materials, or information about programs, contact the Office of Admissions or visit the website at www.citytech.cuny.edu/admissions.

Information about all programs at the City University of New York is available from the CUNY website at cuny.edu or by calling or writing:

City University (CUNY)
Office of Admissions Services
Welcome Center
217 E. 42 Street
Between 2nd and 3rd Avenues
New York City, N.Y. 10017
212.997.2869

APPLYING FOR ADMISSION

Application to all campuses of The City University of New York is done electronically through the University Application Processing Center (UAPC) at <http://www.cuny.edu/admissions/apply.html>

To apply for degree admission to New York City College of Technology, file a formal application prior to the semester in which you plan to register. There is a non-refundable fee of \$65 for freshmen or \$70 for transfers. Before you complete the application, it is important to select your intended major area. You will apply directly to a specific college curriculum and session (day or evening). The application has room for several choices. Indicate your choice of curriculum. You will find descriptions of the various majors and programs elsewhere in this catalog. See the table of contents and index. Admission to the College is granted only for the semester of acceptance. If you do not register for the semester of acceptance, you must file

an application for reactivation of your application before you can register for the following semester. If more than a semester has elapsed between the time you first applied and the semester in which you plan to register, you must reapply through the City Tech admissions office. If you are currently attending or have attended another college, re-apply through UAPC as a transfer student, regardless of the number of credits you have completed.

FRESHMAN STUDENTS

File a freshman application if you are:

- A high school senior
- A student who has earned an equivalency diploma or passed the General Educational Development examination (original scores, not a copy, must be submitted)
- An applicant to the SEEK program
- A foreign applicant whose only previous secondary education has been in the United States and who never attended college
- A student who never attended college.

Applications received by UAPC before February 15 for September admission and before September 15 for February admission will be processed first. Applications received after those deadlines will be processed on a space-available basis. All students are responsible for submitting directly to the college their most recent NYS regents, SAT and ACT scores. These scores must be submitted prior to the first day of classes.

TRANSFER STUDENTS

Admission to City Tech as a transfer student is based upon the student's high school and college academic record. Students without an associate degree will be considered for transfer admission based on the number of credits completed, the cumulative GPA, and competency in English and Mathematics. Students who have earned a CUNY associate degree (AA, AS, or AAS) are guaranteed admission to the College although not necessarily to the program they are

requesting. If you transfer to CUNY with an AA or AS degree, you are guaranteed at least 60 credits toward a baccalaureate degree and required to complete only the difference between the 60 credits granted and the total credits normally required for the degree; however, each department with a professional degree may determine the proper level of placement in its professional course sequence and the extent to which previous coursework can apply. Applications received by UAPC before February 15 for September admission and before September 15 for February admission will be processed first. Applications received after those deadlines will be processed on a space-available basis.

APPLYING TO BACCALAUREATE PROGRAMS

The College offers baccalaureate degrees in a number of areas: the bachelor of technology in architectural technology, communication design, computer systems, computer engineering technology, construction management, electrical engineering, emerging media technology, entertainment technology, facilities management, graphic arts production management, hospitality management, mechanical engineering and telecommunications engineering technology; the bachelor of science in applied mathematics, biomedical informatics, health services administration, human services, legal assistant studies math education, nursing, radiological science, technical writing; the bachelor of science in education in career and technical teacher education and technology teacher education.

Freshman Applicants into a Baccalaureate Degree

The College has established the following minimal standards for admission of freshmen into baccalaureate programs.

Students applying for admission to a baccalaureate program will be evaluated for admission according to a formula that considers preparation in high school English and Mathematics and high school average. Each college of The City University will use

such a formula to identify students who currently have the ability to do baccalaureate-level work. Additionally, all students must have demonstrated competency in reading, writing and mathematics in order to enroll in baccalaureate degree programs (refer to CUNY Testing Information, [click here](#)).

For admissions and advisement purposes, freshman applicants who graduated from high school within the previous academic year will also be required to provide the University with scores for the SAT examination. The SAT requirement does not apply to students who completed their secondary instruction outside the United States, who are classified as ESOL students or who graduated from high school more than one year before their application to the College.

Applicants who do not meet these criteria may be eligible for admission into the corresponding associate degree program. However, please note that some baccalaureate degrees do not have an associate degree program. Students whose credentials fall below the minimum criteria for these programs should enroll in an associate degree program that corresponds to their interests and then may later be eligible to transfer to the baccalaureate of their choice after meeting CUNY requirements in reading, writing and mathematics and a minimum grade point average of 2.0.

Transfer Applicants into a Baccalaureate Degree

Students who have earned a CUNY AA or AS degrees will be granted at least 60 transfer credits. However, where prior college work in the selected curriculum does not fully prepare students for baccalaureate-level work, students may need to complete portions of the associate degree curriculum as part of the baccalaureate degree program. Some departments impose a higher standard than a 2.0 GPA for transfer into their baccalaureate programs.

Students without an associate degree and those students transferring from a non-CUNY college will be considered for admission based on the number of credits completed and their cumulative GPA.

Additional admissions criteria

- Some departments impose additional admissions requirements or criteria. Please consult the appropriate section of the catalog or the website for the department that you wish to enter, or call or email the department.
- All transfer students must demonstrate proficiency in reading, writing and mathematics in order to take baccalaureate-level courses (refer to CUNY Testing Information, [click here](#)).

Right to Appeal Admission Decision

A student denied admission to a City Tech program has the right to appeal. The appeal must be submitted in writing to the Office of Admissions and will be forwarded by Admissions to the appeals committee. All students filing appeals will be notified in writing of the outcome within thirty (30) days of submission of the appeal.

INTERNATIONAL STUDENTS

City Tech is approved by the Department of Homeland Security for attendance by non-immigrant international students. If you expect to be classified F-1 (student visa), you must be a full-time, matriculated student.

International students must apply online at <https://portal.cuny.edu/cms/id/cuny/documents/informationpage/006373.htm>. The College provides additional information for international students on its website at <http://www.citytech.cuny.edu/international/>.

You are considered an international student if you have a temporary visa, regardless of whether your educational credentials are from U.S. or foreign schools.

The Test of English as a Foreign Language (TOEFL) is an examination required of all applicants who are on temporary visas and whose native language is not English. The TOEFL score is not used for ESOL placement.

APPLICANTS EDUCATED OUTSIDE OF THE UNITED STATES

If you have received part or all of your education outside of the United States, even if you are currently attending high school in the United States, please send photocopies

of secondary school transcripts with your application and request that all official transcripts from all postsecondary schools attended be sent directly from the institutions issuing them to UAPC. Any documents written in a language other than English must be accompanied by an official translation.

Mail all documents to:

UAPC
(University Application Processing Center) PO
Box 350136
Brooklyn, New York 11235-0001

DIRECT ON-THE-SPOT ADMISSIONS

If you currently hold a U.S. high school diploma, have received a state General Equivalency Diploma by virtue of satisfactory scores on the GED examinations or currently attend or previously attended a post-secondary institution within the U.S., it may be possible for you to apply for preliminary acceptance to City Tech. For further information on On-The-Spot Admissions, call the admissions office, 718.260.5250.

FORMER STUDENTS OF NEW YORK CITY COLLEGE OF TECHNOLOGY

If you previously attended City Tech but have not been in attendance for the prior semester or longer, you must apply to the Office of the Registrar at New York City College of Technology for readmission. A \$20 fee is required and is included on the next semester bill. Readmission applications should be filed by December 1 for the spring semester and by June 15 for the fall semester. Thereafter, readmission will be on the basis of space availability.

Students who were on academic probation when they stopped attending must have their application for readmission approved by the department to which they are applying.

Students who have not attended City Tech for at least five years must resubmit proof of a high school diploma. It may also be necessary to submit documents proving New York State residency to be eligible for some financial aid programs and the in-state tuition rate.

NON-DEGREE STUDENTS

If you wish to enroll in one or more courses for enrichment purposes only, it may be possible for you to apply as a non-degree student. Because not all departments allow registration on a non-degree basis, it is advisable to meet with an admissions counselor to discuss your eligibility for non-degree status.

Non-degree students must apply in person at the Office of Admission, room NG 17. The application is available online at <http://www.citytech.cuny.edu/admissions/index.aspx#how-to-apply>. Your application must be accompanied by your high school diploma or transcript, or your college transcript or your college diploma and a \$65 non-refundable application fee (money order).

SENIOR CITIZENS

If you are 60 years of age or older and meet the CUNY requirements for demonstrating New York state residency, you may audit courses tuition-free on a space-available basis. As an auditor, you will receive neither grades nor academic credit. Upon registration, you must pay a \$65 fee at the Office of the Bursar. If you wish to receive academic credit, you must pay the appropriate tuition for the courses. In either case, you must apply according to the procedures outlined above. To take advantage of the Senior Citizen option, you must provide proof of age, i.e., birth certificate, driver's license or Medicare card, to the Office of Admissions prior to registration.

SUMMER STUDENTS

City Tech offers an extensive summer program; however, not all courses listed in the catalog are available during the summer session. Students attending other colleges who wish to attend City Tech during the summer are eligible to enroll as permit or non-degree students. They should contact the admissions office for information and applications.

STUDY ABROAD PROGRAMS

Study abroad programs offered through The City University of New York enable students to explore the traditions and modern realities of the world while viewing their homeland from another perspective. All programs offer a full course of study for students with a 2.5 GPA and in most cases students can receive credit towards their degree. No previous language study is required for most programs. Financial aid may apply and special financial assistance is often available. Students interested in the Study Abroad Program should contact Ms Alexis Chaconis, Director of Admissions Services at achaconis@citytech.cuny.edu.

The **IMMUNIZATION REQUIREMENTS** section can be found in the Important Policies and Procedures section.

The **UNIVERSITY POLICY ON THE SUBMISSION OF FRAUDULENT DOCUMENTS IN SUPPORT OF AN APPLICATION FOR ADMISSION** section can also be found in the Important Policies and Procedures section.

TUITION DEPOSIT

Each college of The City University of New York is required to receive from each admitted student a non-refundable tuition deposit of \$100 before the student will be permitted to register. Veterans, Special Programs students (including SEEK) and students whose Free Application for Federal Student Aid (FAFSA) shows an effective family contribution (EFC) of \$3,000 or less will be exempt from the deposit requirement.

CUNY Testing and Placement

Teresa Parker, Director
General Building, room G 207
300 Jay Street
Brooklyn, New York 11201
Phone: 718.260.5171
email: testingoffice@citytech.cuny.edu

CUNY Testing and Placement Information

The City University of New York requires that students demonstrate an appropriate level of proficiency in general academic skills when enrolling.

REQUIREMENTS FOR STUDENTS ENROLLING AT CUNY

In order to be admitted to a baccalaureate program at CUNY, students must demonstrate skills proficiency in reading, writing, and mathematics. This can be done in one of several ways:

- **By achieving a score of 75 or higher on New York State Regents Exam** in English Language Arts. In Mathematics,
 - or a score of 75 or higher on New York State Regents Exam (Math A or B, or Sequential II or III),
 - or a score of 80 or above in Integrated Algebra or Geometry or Algebra 2/ Trigonometry and successful completion of Algebra 2/Trigonometry or a higher level high school math course (see Table 1 for details)
 - Or Common Core Regents: A score of 70 or above in Algebra 1 or Geometry or a score of 65 or above in Algebra 2/Trigonometry.
- **By achieving a score of 480 or above on the SAT Verbal/Critical Reading and Evidence-Based R/W section** (March 2016) and 530 or above on the SAT Math section with an exam date of March 2016 or thereafter.
- Admissions requirement for math may also be met by one of the following:
 1. **CUNY Transfer** – Document successful completion of a 3 or more credit college level math course earning a passing grade.
Non-CUNY Transfer – Document successful completion of a 3 or more credit college level math course earning a grade of C or better (if learning outcomes are deemed appropriate).
 2. Document successful completion of elementary algebra at a CUNY college or other regionally or New York State accredited institution – a passing grade within CUNY or a grade of C or higher from non-CUNY courses (if learning outcomes are deemed appropriate).
 3. COMPASS test scores: M1-45, M2-40 or higher. Proficiency is met with an M2 score of 40.
 4. Accuplacer: M5 score of 57 or higher
- **Effective fall 2014**, the following groups of current and former students will also be deemed to have met the minimum proficiency requirements in mathematics:
 - a. CUNY associate degree holders.
 - b. Students who were proficient based on the standard in place at the time of their admission
 - c. Students who have met the COMPASS Elementary Algebra (Math 2) cut score of 40 or above, irrespective of Pre-algebra (Math 1) score.
- **Transfer students**-Admissions requirement for reading and writing may be met by a grade of C or better in freshman composition, its equivalent or a higher-level English course. Students with foreign credits may be required by the College to take the CAT (CUNY Assessment Test) to determine placement in language skills courses and/or math.
- Students with a bachelor's degree or higher are exempt from the testing requirement. However, these students may be required by the College to take the tests in order to determine placement in math or language-skills courses.
- By achieving passing scores on the CUNY Assessment Tests, students without the appropriate Regents or SAT scores or transfer credits in English or mathematics may meet the admissions criteria in three skills areas: reading, writing and mathematics.

Students who score below the University-designated level on any of these tests and who are not exempted by Regents or SAT scores or transfer credit, must enroll in an appropriate program of remediation in that area. Students whose first language is other than English may be advised to take English as a Second Language rather than courses in developmental reading and writing.

In addition to being required for admission to a bachelor's program, demonstrated proficiency in reading, writing, and mathematics is required for acceptance into some associate degree programs and for eligibility to take many college courses. Placement results are provided when students come to the College to meet with an academic advisor and register for courses. The advisor can provide more detailed answers to questions about the results of the tests. New York City College of Technology requires that all students enrolled in associate degree programs demonstrate proficiency in reading, writing and mathematics prior to the completion of 12 credits.

Students who achieve a score of 75 or above on the NY State Regents Exam in English Language Arts or a score of 480 or above on the SAT Verbal/Critical Reading or Evidence-Based R/W section are exempt from the CUNY Reading and Writing Tests. Likewise, students who achieve a score of 75 or above on the NY State Mathematics A or B Regents Exam, the Sequential II or III Exam; 80 or above on either Integrated Algebra, Geometry or Algebra 2/Trigonometry Exams*; or a score of 500 or above on the SAT Mathematics Test (raised to 530 or above for test dates on or after March 2016) are exempt from the pre-algebra and algebra parts of the CUNY Mathematics Test. However, the College reserves the right to test entering students with the CUNY Mathematics Test for placement into appropriate levels of mathematics and mathematics-related courses.

CUNY Website

Online resources, including practice materials for the CUNY Assessment Tests, are available at the CUNY Testing site: <http://www.citytech.cuny.edu/testing/>

COLLEGE PLACEMENT POLICY

In addition to the requirements described above, entering freshmen admitted to associate degree programs at New York City College of Technology must satisfy the following in order to enroll in College courses:

1. Exemption from the CUNY Assessment Tests (See above) or
2. Placement based upon scores and the availability of seats

Students will receive a letter upon admission to the College describing this policy and outlining opportunities to prepare for the CUNY Assessment Tests. Students who do not meet the above criteria can establish eligibility for college course work by successfully completing an appropriate remedial program in the College's First Year Summer Program, at the Brooklyn Educational Opportunity Center (BEOC), or at a community college.

Students who do not meet the above criteria may, under exceptional circumstances, appeal for permission to enroll in college courses. The appeal will be decided by a Placement Appeals Committee consisting of the Director of Admissions, a faculty member from the student's major department designated by the department chairperson, and a faculty member designated by the Dean of the School of Liberal Arts and Sciences. This deferred enrollment policy does not apply to ESOL or SEEK students. This policy took effect in Fall 2007. Information on the educational progress made by students who do not meet these criteria will be collected by the College, provided to the Committee on Students, and reported by the Committee to the College Council annually.

Note: Special Arrangements for Testing Accommodations based on disabilities will be granted to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Students who wish to request such accommodations should contact the College's Testing Office or The Center for Student Accessibility.

TABLE 1
EXEMPTION CRITERIA FOR CUNY ASSESSMENT TESTS

Test	Exemption Criteria
Math	<p>≥ 500 on the Math portion of the SAT ≥ 530 on the Math portion of the SAT for test dates on or after March 2016 (≥ 21 on the ACT)</p> <p>≥ 75 or higher on the NYS Math A or Sequential II or III Regents Exams (see p. 11) or Common Core Regents.*</p> <p>Transfers only – A three or more credit Math course with a passing grade within CUNY or a grade of C or higher from an accredited college or university</p> <p>Successful completion of a college elementary algebra course</p> <p>Passing grade in CUNY, or C or higher, for non-CUNY courses</p>
Reading	<p>≥ 480 SAT Verbal/Critical Reading score/EBRW (03/16) ≥ 20 ACT English</p> <p>≥ 75 or higher on the NYS English Regents Exam.</p> <p>Transfers only – A three or more credit Freshman Composition or equivalent course with a grade of C or higher from an accredited college or university</p>
Writing	<p>≥ 480 on the Verbal/Critical Reading portion of the SAT/EBRW (03/16) (≥ 20 on the ACT)</p> <p>≥ 75 or higher on the NYS English Regents Exam.</p> <p>Transfers only – A three or more credit Freshman Composition or equivalent course with a grade of C or higher from an accredited college or university</p>

TABLE 2
DEFINITIONS OF SKILLS PROFICIENCY AND LOWER-LEVEL REMEDIATION ON CUNY ASSESSMENT TESTS

Test	Exemption Criteria and Proficiency Score	Lower-Level Remediation on CUNY Assessment Tests
Math	≥ 57 Algebra	Accuplacer score 39 and below
Writing	≥ 56	less than 46 on CATW Exam
Reading	≥ 55	Accuplacer 45 and below

Tuition and Fees

The College reserves the right to change tuition, fees and charges after publication of the catalog, bulletin and any registration material issued by the College, to reflect changes made by the Board of Trustees of The City University of New York. These changes may be made without prior notice and at any time.

In the event of an increase in the fees or tuition charges, payments already made to the College will be treated as partial payment and notification will be sent to the student of the additional amount due and the time and method of payment. In the event of an overpayment, the appropriate amount will be refunded.

All tuition and related fees are due at the point of registration. This includes any and all financial aid awards to be used as tuition funding.

NEW YORK STATE RESIDENCY FOR TUITION PURPOSES

Students may qualify for the resident tuition rate if they have continuously maintained their residence in the state of New York for a period of twelve consecutive months before the first day of classes. Students who are undocumented or out-of-status aliens and those who are not residents of New York State may be eligible for the lower tuition rate, if they meet certain conditions.

To make it possible for veterans who were not New York State residents prior to their military service to attend CUNY and live in New York for the required period to establish New York State residency, a new CUNY policy has been enacted. Under this new policy, veterans will be charged in-state tuition for the first eighteen months of their attendance at CUNY. This should give veterans more than enough time to establish residency under CUNY's guidelines, which require proof of residency in New York for one year and an intent to reside in New York State permanently. If the veteran does not establish residency after 18 months, he/she will no longer be entitled to pay the resident tuition rate.

******IMPORTANT NOTE:** A residency form with all the required documentation must be submitted to the Office of Scholarships and Residency Services (Namm G-09) on or before the last day of the semester in question. The College will not review any residency determination unless the request for the review is made in writing, and all the required documentation is submitted (including completed CUNY Residency Form). Students requesting residency status for tuition purposes are expected to be aware of the requirements necessary to qualify for the in-state residency. The College will not make residency determinations retroactively and will not issue refunds to students even in cases where they would have qualified for the resident rate if they had submitted timely documentation.

If you have any questions about residency, please visit <http://www.cuny.edu/about/administration/offices/la/tuition-fee-manual.html#4> or contact the Office of Scholarships and Residency Services, Namm Hall, room N/G 09, 718.260.5054.

RESIDENT STUDENTS

(These new rates are effective for Fall 2017)

Full-time Matriculated.....	\$3,265/semester
Part-time Matriculated	\$285/credit
Non-degree.....	\$415/credit
Senior Citizen Fee.....	\$65/semester or session

ALL NON-RESIDENT STUDENTS

(These new rates are effective for the Fall 2015)

Full-time or Part-time Matriculated.....	\$580/credit
All Non-degree.....	\$865/credit

Tuition Rates for Undocumented and Out-of-Status Aliens

All CUNY colleges charge students who are undocumented or out-of-status aliens the non-resident tuition rate. This change is being made to comply with Federal law, specifically the Illegal Immigration Reform and Immigrant Responsibility Act, which requires public colleges and universities to charge undocumented or out-of-status aliens the same rate of tuition as that charged out-of-state U.S. citizens and residents.

REFUND POLICY

(Tuition and Accelerated Study Fee)

The official date of the student's withdrawal is the date on which the program change or withdrawal forms are filed with the College, not the last date of attendance in class. The official withdrawal date serves as the basis for computing any refund granted the student. No portion of the student activity fee, special

fees or penalty fees is refundable, except in cases where the student's registration or courses are canceled by the College.

City University of New York Refund Policy

All other students are subject to the following refund schedule as approved by the Board of Trustees of The City University of New York:

Withdrawal before the scheduled opening date of the session:

- Fall and Spring, 100%
- Summer Session, 100%

Withdrawal within one week after the scheduled opening date of the session:

- Fall and Spring, 75%
- Summer Session, 50%

Withdrawal during the second week after the scheduled opening date of the session:

- Fall and Spring, 50%
- Summer Session, 25%

Withdrawal during the third week after the scheduled opening date of the session:

- Fall and Spring, 25%
- Summer Session, none

Withdrawal after completion of the third week of the session:

- Fall and Spring, none
- Summer Session, none

CONFIDENTIALITY OF STUDENT FINANCIAL RECORDS

Consistent with recent Federal Trade Commission guidelines, the College carefully preserves the confidentiality of all student financial information. Appropriate safeguards are in place to protect the security of information held in digital form. Where breaches in security beyond the control of the College may occur, the College acknowledges its responsibility to promptly notify those whose confidentiality may have been compromised.

MILITARY AND PEACE CORPS REFUND POLICY

The following principles govern refunds to students withdrawing for military or Peace Corps service.

- Military service must be documented with a copy of induction or military orders. Peace Corps service must be documented.

- In order to obtain a grade, a student must attend approximately eleven (11) weeks of the semester (five weeks for summer session). No refund will be made to a student who has been assigned a grade regardless of whether the grade is passing or failing.

In instances where students who have enlisted in the armed services or Peace Corps do not attend for a sufficient time to qualify for a grade but continue in attendance to within two weeks of induction, refund of tuition and all fees, except application fee, will be made as follows:

- Withdrawal before beginning of the fifth calendar week of the semester (third calendar week for summer session) after scheduled opening date of session is 100%; withdrawal thereafter is 50%.

NON-INSTRUCTIONAL FEES

Full-Time Students

(12 or more credits and/or remedial contact hours) per semester

Student Activity Fee	\$59.20
Technology Fee	\$125.00
University Student Senate Fee	\$1.45
Consolidated Service Fee	\$15.00
Total Fees	\$200.65

Part-Time Students

(Fewer than 12 credits and/or remedial contact hours) per semester

Student Activity Fee	\$27.35
Technology Fee.....	\$62.50
University Student Senate Fee	\$1.45
Consolidated Service Fee	\$15.00
Total Fees	\$106.30

A full listing of the components of the student activity fee can be found at <http://www.citytech.cuny.edu/admissions/tuition-non-instructional.aspx>.

All Students

(Including Non-Degree and Senior Citizens)

Consolidated Service Fee\$15.00
Student activity fees (other than NYPIRG), University student senate fee and the consolidated service fee or any part thereof are not refundable at any time.

The \$4.00 NYPIRG fee, which is included in the student activity fee, may be refunded only by written request to NYPIRG. You may pick up the appropriate form at the NYPIRG office in the General Building, room G 516.

TECHNOLOGY FEE

The Trustees of The City University of New York have established a technology fee, currently \$125.00 per semester for full-time students and \$62.50 per semester for part-time students, including the summer. Revenue from this fee will be retained by the individual colleges to improve computer services for their students and faculty.

PENALTY FEES

Late Registration Fee\$25
Charge for registration after the close of the official registration period. Under exceptional circumstances, the College may extend the official registration period.

Program Change Fee\$18
Each of the following is considered to be a program change: adding a course or courses, dropping and adding a course or courses, changing from one section of a course to another section of the same course.
The program change fee is waived when the College assumes responsibility for the change.

Non-Payment Service Fee\$15
Students who are delinquent in paying tuition and fees will be required to pay this fee in addition to all outstanding bills to regain the privileges of good fiscal standing with the College which include the right to attend classes and access to one's student records. If the student is required to pay a readmission fee, the non-payment service fee shall be in addition, if appropriate.

Return Check Fee\$20
Checks returned unpaid to the College by a financial institution, no matter the amount or reason for the return, will automatically incur a \$20.00 reprocessing fee in addition to the original obligation. The Business Office will attempt to notify the student or former student who submitted the returned check to provide information on making payment. The Bursar's Office will no longer accept checks in payment of tuition or fees, even if the student or former student wishes to use someone else's check.

If the financial institution supplies a letter to the College admitting error on its part, the student will have his/her check writing privileges restored.

Miscellaneous Charges

In addition to those charges listed above, there are other charges for overdue library books, replacement charges for keys and locks and breakage charges for repair or replacement of any College laboratory equipment damaged or lost.

Outstanding Balances

Outstanding semester balances may be paid in cash, check or money order. The use of a personal check for a previous semester balance will delay the clearance of the student's record for ten (10) business days.

A student who fails to pay tuition or other obligations will be denied access to his/her records and will be prevented from registering in the future. The account will be turned over to the College's collection agency for appropriate action.

The student will be responsible for all collection costs, including agency fees, attorney fees and court costs, in addition to whatever amount you owe the College. Please note that non-payment or a default judgment against your account may be reported to credit bureaus and reflected in your credit report.

Financial Aid

New York City College of Technology (NYCCT) participates in all federal and state financial aid programs. Financial aid is available to students in the form of grants, loans and work-study. Grants provide funds that do not have to be repaid. Loans must be repaid. Federal Work-Study consists of part-time employment, either on campus or in an outside agency.

Full-time students are best positioned to capitalize on the maximum awards. For financial aid purposes, a student is considered to be full-time if he or she is registered for a minimum of 12 credits/units or the equivalent or equated credits/units within the semester. A student is considered part-time if he or she is registered for fewer than 12 credits/units or equated credits/units during a semester.

Applying for Federal and New York State Financial Aid

Students should complete three financial aid applications. The first application is the Free Application for Federal Student Aid (FAFSA), which can be found online at www.fafsa.gov. To begin, students should apply for a federal student aid identification (FSID) at www.studentaid.ed.gov, which allows students to apply, make corrections and access their federal financial aid information easily. Parents of dependent students should also apply for a PIN. **The college code for City Tech is 002696 and should be indicated on the FAFSA.**

The FAFSA is an application for Federal Pell Grant, Federal Work-Study, Federal Perkins Loan and Federal Supplemental Educational Opportunity (FSEOG) Grants. Students applying for Federal Direct Loans must complete both the FAFSA and the Direct Loan Processing Form. If a student does not wish to file online, he or she may file the paper FAFSA by going to www.fafsa.gov/options.htm. The paper FAFSA must be completed, signed and mailed to the processor. This process will take approximately 2 to 3 weeks.

The second financial aid application is for the New York State Tuition Assistance Program (TAP). Students can apply for TAP through the link for New York State residents on the FAFSA on the web Submission Confirmation Page. They will be asked to establish a PIN for TAP which allows them to apply for TAP,

keep track of application information and make changes. **The TAP college code for City Tech is 1405.** Students who file the TAP application are considered for New York State financial assistance programs (TAP, Aid for Part-time Study {APTS}, Part-time TAP {PTAP}). Those who use a paper FAFSA to apply for federal aid may still choose to complete the TAP application on the web at www.hesc.ny.gov. Approximately 3-4 business days after submitting the FAFSA, the student will receive an email message to go to www.hesc.ny.gov to complete the TAP web-based application. Students who choose not to apply online will receive an Express TAP Application (ETA) in the mail.

The third application is the CUNY Supplement Form. Students should log into the CUNY Portal to complete the CUNY Financial Aid Supplement online. It is used to calculate Aid for Part-time Study (APTS), and Federal Perkins Loan. Students who do not wish to receive APTS or a Federal Perkins Loan do not have to complete the CUNY Supplement Form.

When the FAFSA is processed, students receive a Student Aid Report (SAR) from the U.S. Department of Education via email or by mail if the student did not provide an email address. The SAR displays the information submitted on the FAFSA including the Expected Family Contribution (EFC). See the section on "Financial Need and Expected Family Contribution (EFC)" below. Students should review the SAR to make sure the financial and biographic information are correct and make corrections as soon as possible online. Alternatively, students can come to the financial aid office with supporting documentation to make changes. Students should check their CUNYfirst account "Student Services Center" to-do list for a complete list of requested documents. Students also receive an email from the New York State Higher Education Services Corporation regarding eligibility for TAP. An award letter is sent to part-time students acknowledging eligibility for APTS after certification from the financial aid office. An award letter from the financial aid office includes all awards that they are eligible for during the award year.

In Cases of Unusual Circumstances

If a student is required to provide parental data on the FAFSA, but cannot because of extreme circumstances that have caused involuntary separation from his/her parents, the student should see a financial aid counselor and ask about dependency reclassification. The student must follow the process given on the "Dependency Reclassification Appeal Form." In addition, if the student or the student's family has experienced a change in situation from the prior year, such as loss of employment, separation of parents or some other hardship, the student should see a financial aid counselor to review the federal financial aid application and the family's current finances. This process of review may lead to an income adjustment that more closely reflects the current circumstance. The student must complete the FAFSA first, using the income for the year as requested on the application and inquire about an income reduction. The student must follow the guidance given on the "Income Adjustment Request Form." Both the "Dependency Reclassification Appeal Form" and the "Income Adjustment Request Form" are located on the financial aid website at <http://www.citytech.cuny.edu/financial-aid/forms.aspx>.

Applying for Aid Is an Annual Process

Students must file for financial aid annually starting in October for the upcoming academic year (summer, fall and spring terms).

Students may also go to the financial aid application review site/web lab, located in Namm Hall, room G 08A, if they need assistance in completing their applications. Please call 718.260.5700 or go to the City Tech financial aid website located at <http://www.citytech.cuny.edu/financial-aid/> to check office hours.

Financial Need and Expected Family Contribution (EFC)

Financial aid eligibility is based on financial need (except for unsubsidized Federal Direct Loan and PLUS Loan). When students apply for federal student aid, the information reported on the FAFSA is used in a formula established by the U.S. Congress that

calculates the Expected Family Contribution (EFC). The EFC is the amount the student and parents (if the student is dependent) are expected to contribute toward the student's education. If the EFC is within a certain range, students are eligible for a Federal Pell Grant.

The EFC is used to determine financial need. When CUNY receives a student's FAFSA information from the Department of Education, CUNY develops the student's budget or cost of attendance. The budget is based on whether the student lives with the parents or away from home and if the student will attend college for one full academic year (9 months) or one semester (4.5 months).

The EFC is subtracted from the Cost of Attendance (COA). The remainder is financial need. The "financial need" equals the COA minus the EFC. The student may not receive financial aid in excess of his financial need. In other words, the student's financial need is the maximum amount of financial aid, including Federal Subsidized Direct Loan the student may receive for an academic year. Besides determining the amount the student can receive from the Pell Grant, the federal EFC is also used to determine eligibility for Federal Supplemental Educational Opportunity Grant (FSEOG), Federal Work-Study (FWS) and the Federal Perkins loan.

SAR Submission Policy

All students' correct and complete FAFSA information (SAR) must be processed by the U.S. Department of Education and received by the school before the last day of enrollment to be eligible for federal financial aid. If a student is advised that his/her FAFSA information is subject to verification, the student must submit all requested documents to the financial aid office and the information must be processed and finalized with the U.S. Department of Education within 120 days of the student's last day of attendance. Failure to submit the required documentation may result in loss of Federal Financial Aid. The Office of Financial Aid will notify students of any changes to EFC or Cost of Attendance via email at their official City Tech email addresses.

The Cost of Attendance (Student's Budget)

The cost of attendance or budget is an estimate of the amount of money it will cost a student to attend college for an academic year set each year by the University. It includes tuition, fees, books, transportation, housing and food expenses.

Student Resources

Students should consider the resources that they will have from earnings and savings, the amount their parents can contribute and any benefits that will be received, such as Social Security, veteran's benefits, or unemployment that can be used at the beginning of the semester. Savings from summer employment can help meet the initial costs of enrollment; however, students will need additional money for books, supplies, and transportation. If financial aid exceeds tuition charges, students may qualify for an early partial disbursement of the Pell Grant in the form of a book advance payment.

Study Abroad

Students who enroll in an overseas program of study approved by the College are eligible to receive federal financial aid and, in some cases, state aid. The coursework for which they enroll must be applicable to their degrees.

Permit-Out Students and Financial Aid Payments

Students who wish to take courses at other CUNY or non-CUNY colleges need to be aware of how financial aid payments will be made.

Permit-Out (Colleges within CUNY)

Students who are on permit-out at another CUNY college (the Host College) pay their tuition and fee charges at City Tech, the Home College and may be paid financial aid at City Tech upon submission of proof of registration (which must have official registrar's stamp) from the host college. At the end of the semester, students must also submit their official transcripts to the Financial Aid Office, Namm Hall, room G 13. A negative service indicator will be placed on the records of students who do not submit an official transcript two weeks after the end of the semester.

Permit-Out (Non-CUNY Colleges)

The Non-CUNY Permit Form requires approval/signature of a financial aid counselor or staff member. A consortium

agreement must be completed in order to receive financial aid for classes taken at non-CUNY institutions.

Federal Student Eligibility

To receive aid from any of the federal student aid programs, a student must meet all of the following conditions:

- demonstrate financial need, except for Direct Unsubsidized and PLUS Loans,
- have a high school diploma or equivalent or have been home schooled,
- be enrolled or accepted for enrollment as a student working toward a degree or certificate in an eligible program,
- be a U.S. citizen or eligible non-citizen,
- have a valid Social Security number (unless student is from the Republic of the Marshall Islands, the Federated States of Micronesia or the Republic of Palau),
- meet satisfactory academic progress standards,
- certify that federal student aid will be used only for educational purposes,
- certify that the student is not in default on a federal student loan and that he or she does not owe money on a federal student grant,
- be in compliance with Selective Service registration regulations (males only)
- meet enrollment status requirements,
- resolve any drug conviction issue
- not receive more than twelve semesters of full-time Federal Pell Grant payments; such students are ineligible for additional Federal Pell Grant and Federal SEOG.
- meet all admissions and academic advisement requirements

The Higher Education Act of 1965 as amended (HEA) suspends aid eligibility for a student who has been convicted under federal or state law of the sale or possession of drugs, if the offense occurred during a period of enrollment for which the student was receiving federal student aid (grants, loans, and/or work-study). If the student has lost federal student aid eligibility due to a drug conviction, he or she can regain eligibility

by passing two unannounced drug tests conducted by a drug rehabilitation program that complies with criteria established by the U.S. Department of Education.

Students subject to involuntary civil commitment after completing a period of incarceration for a forcible or non-forcible sexual offense are ineligible to receive Federal Pell Grants.

Students ineligible for federal aid should still complete the FAFSA to see if they may be eligible for non-federal aid from states and private institutions. When students regain eligibility during the award year, they should notify their financial aid administrators immediately. Students convicted of a drug-related offense after submission of the FAFSA may lose eligibility for federal student aid, and might be liable for returning any financial aid received during the period of ineligibility.

Referral of Fraud Cases

Any student, employee, or other individual suspected of misreporting information or altering documents to fraudulently obtain federal funds will be reported, with all evidence gathered, to the Office of Inspector General.

Federal Satisfactory Academic Progress Standard (SAP)

Students must be making satisfactory academic progress towards completing their degree in order to remain eligible for federal financial aid at City Tech.

There are three components to City Tech's satisfactory academic progress standard:

1. Minimum GPA – Students must achieve at least the GPA required to meet the College's minimum retention standard listed below; students enrolled in a program of more than two years must have a GPA of at least a 2.0 or equivalent or must have an academic standing consistent with the College's graduation requirements.

While students are enrolled at City Tech, their academic performance is continually evaluated. Evaluation is based on cumulative Grade Point Average (GPA). Students who do not meet the College's minimum retention standard below, may run the risk of academic probation or dismissal.

Minimum Retention Standard

Credits or Units Attempted	Minimum GPA
.5 – 12	1.50
13 – 24	1.75
25 – upward	2.00

2. Maximum Time-frame – Students may not attempt more than 150% of the credits/units normally required for completion of their degree. Students pursuing a two-year degree program (requiring 60 credits or units) fail to meet academic progress if they attempt 90 or more credits/units. Students pursuing a four year degree program (requiring 120 credits or units) fail to meet academic progress if they attempt more than 180 credits/units.

3. Pace of Progression – For students pursuing an associate or baccalaureate degree, accumulated or earned credits must be equal to or greater than a certain percentage of the total credits attempted according to the following tables:

Associate Degrees (Two-Year Programs)

Attempted Credits	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
Earned Credits	0	0	2	4	6	13	19	23	27	33	39	44	49	55	61

Baccalaureate Degrees (Four-Year Programs)

Attempted Credits	15	30	45	60	75	90	105	120	135	150	165	180
Earned Credits	0	5	16	27	42	50	63	72	84	95	108	117

All students (whether aid recipients or not) will be measured against each of the three SAP components at the end of the spring term to determine eligibility for federal financial aid for the upcoming award year.

Financial Aid Suspension

Students who fall below the College's GPA standard, exceed the maximum time frame, or fail to meet the pace of progression standard, will be placed on financial aid suspension and lose their eligibility to receive federal financial aid. Such students will remain ineligible for federal financial aid until they take actions that meet the appropriate academic progress standard.

Right to Appeal

Students who have been placed on federal financial aid suspension may appeal to the Committee on Financial Aid Standing to regain their eligibility to receive federal student aid. Students may appeal any component of the satisfactory academic progress standard they have not been able to meet including not meeting the minimum GPA and exceeding the maximum time frame for program completion.

An appeal must be based upon mitigating circumstances resulting from events such as, personal illness or injury, illness or death of a family member, loss of employment, or changes in the academic program. The appeal must include an explanation of why the student failed to make satisfactory academic progress and what has changed in the student's situation to allow him to meet the appropriate academic progress standard in future evaluation. The student must also submit proof and documentation of mitigating circumstances.

The Committee on Financial Aid Standing will determine whether the documentation shows that a student experienced mitigating circumstances. If the Committee on Financial Aid Standing determines that the student has a reasonable chance of regaining academic eligibility, the Committee will grant the appeal.

Financial Aid Probation

As part of granting an appeal, the Committee determines whether the student is able to regain academic eligibility in one semester, or needs more than one semester to regain eligibility. If the College determines that a student should regain his or her academic standing in one semester, the student's financial aid will be reinstated for the semester (probationary semester), and the College will evaluate the student's academic progress at the end of the probationary semester to determine if the student has regained his academic standing. If the student meets the academic requirements, he or she will continue to receive federal financial aid. If a student fails to meet the academic requirements at the end of the probationary semester, his financial aid will be suspended.

If the College determines that the student needs more than one semester to regain academic eligibility, the College will develop an academic plan with the student and reinstate the student's financial aid for the probationary semester (initial semester). At the end of the initial probationary semester, the College will review the student's academic progress to determine if he or she has fulfilled the requirements of his academic plan. If the student meets the requirements of the academic plan, he or she will continue to receive federal financial aid on a monitored, semester-by-semester basis until the next scheduled academic progress evaluation.

There is no limit on the number of times a student may go through the financial aid appeals procedure. Although a student may file only one appeal per payment period (semester), additional appeals to extend financial aid probation to subsequent semesters are allowed. As in the original appeal, the student would indicate the mitigating circumstances, the reasons why satisfactory academic progress was not achieved, and what has changed that will ensure the student will be able to meet satisfactory academic progress at the next evaluation. If a student fails to meet the conditions of an approved academic plan, he or she may submit an additional appeal to modify or adjust the plan for the subsequent payment period(s) documenting any unusual circumstances that prevented him or her from meeting the goals established by the original plan. The Committee on Financial Aid Standing may approve or decline the subsequent appeal or may create an updated plan based on the information submitted.

Re-establishing Eligibility

Other than having eligibility restored through filing a successful appeal, students on financial aid suspension may regain eligibility only by taking action that brings them back into compliance with the appropriate progress standard. The mere passage of time is insufficient to restore federal financial aid eligibility to students who have lost eligibility due to not meeting the satisfactory academic progress standard. Therefore, students may

not re-establish eligibility solely by leaving City Tech for at least one year because this action alone does not bring students into compliance for federal financial aid academic progress standards.

Students who choose to remain enrolled without receiving federal financial aid may request a review of their academic record after any term in which they were on financial aid suspension to determine if they re-attained the appropriate standard. Students on financial aid suspension at the beginning of the academic year for not meeting one or more components of the College's satisfactory academic progress standard, but who meet them at some point later in the academic year, may regain federal financial aid.

Determining Attempted Credits and Accumulated Credits and Applying Credits to SAP

Attempted credits pertain to the courses and credits that must be included in the quantitative measure of progress to calculate pace of progression and maximum time frame. The accumulation of attempted credits usually reflects the semester course enrollment maintained in a student's permanent record at City Tech and will usually reflect a student's enrollment as of the Form A date (last day of "drop period"). Accumulated credits should reflect credits that the student has earned towards the completion of the degree program in which the student is enrolled. In measuring satisfactory academic progress, certain types of courses, situations, and procedures may affect a student's GPA and pace of progression and are treated in the following way:

1. Remedial Courses – Since remedial courses and the remedial component of developmental and compensatory courses do not carry degree credit, the non-credit component of these courses is not included in the total cumulative attempted credits or accumulated credits for determining pace of progression. However, the credit-bearing portion of compensatory or developmental courses is included in cumulative earned and/or attempted credit totals for determining pace.

2. Withdrawals – Since the Form A date usually reflects a student's course load for the term, classes that are dropped during the program adjustment period are not included as cumulative attempted credits. Withdrawals which are recorded on a student's permanent record are included as cumulative attempted credits and have an adverse affect on a student's ability to meet the pace of progression standard.

NOTE: Retroactive "non-punitive" administrative withdrawal activity may require students to repay any assistance received as a result of enrollment at the time of receipt of assistance funds.

3. Incomplete Grades – Courses with incomplete grades are included as attempted credits. However, these courses cannot be used as credits accumulated toward the degree. If a student later receives a letter grade above an F in an incomplete course, that course can then be included in the accumulated credits that determine eligibility for the term and subsequent terms within the academic year.

4. Repeated Courses – Successfully completed courses can generally be accepted toward degree requirements once. However, each time a student attempts a course, even if that course is part of a forgiveness or amnesty policy whereby credits attempted and grades earned in prior semesters are excluded from the GPA, it must be included as part of the cumulative attempted credit record for the measuring of pace of progression. Therefore, repeated courses, regardless of the prior grade, may make it more difficult to meet the pace of progression standard.

Note: revised regulations allow students to receive federal financial aid for one repeat of a previously passed course as long as students are again receiving credit for the course. Should students subsequently fail the course, any additional attempt of that course cannot be included in students' enrollment status for federal financial aid. There is no regulatory limit on the number of times students may be paid to retake a failed course unless they have also previously passed the course.

5. Transfer of Credit – Transfer students have their status initialized for measuring satisfactory academic progress by counting the transfer credits accepted toward the degree as both credits attempted and credits earned.

Treatment of Non-Standard Situations

1. Readmitted Students – Upon readmission after any period of non-re-enrollment, students' academic progress standing is re-evaluated as it was at the end of the last semester of attendance at City Tech. If students take action during the period of non-re-enrollment at City Tech to improve academic progress, such as successfully completing transferrable courses at another institution, it is factored into the academic assessment. If students do not take any action to meet the academic standard, or if it was not sufficient to meet the academic progress standard, they will remain on financial aid suspension and must file a successful appeal to re-establish eligibility.

2. Second Degree Students – Students enrolling for a second baccalaureate or associate degree have their pace of progression status initialized for purposes of satisfactory academic progress measurement by using the number of credits determined to be acceptable toward the degree as both the students' cumulative attempted credits and cumulative earned credits. Students who completed 4-year degrees are not eligible to receive a Federal Pell Grant or a Federal Supplemental Educational Opportunity Grant (FSEOG).

3. Change of Major – Students who change their major within the same degree or certificate program have their academic progress standard (maximum time frame) initialized as the number of credits accepted, number of credits earned, and the number of credits attempted toward the new degree.

Change of Degree

For students changing objectives and pursuing different degrees or certificates, academic progress (maximum time frame) is evaluated based on the time frame established for the new degree or certificate.

Discretionary Fund Appeal for Lost TAP

Students who have lost TAP funding because of a documentable college advisement and/or administrative error have the option to appeal to the Discretionary Fund Appeals Committee to request funds lost as a result of the error. The Discretionary Fund Appeals

Committee members are appointed by the Vice President of Enrollment and Student Affairs and this committee will review all appeals. An appeal must be based upon circumstances resulting from the error and the appeal must include supporting documentation. The student must follow the directions provided on the "Discretionary Fund Appeals Form," which is located in the New Student Center or on the financial aid website at <http://www.citytech.cuny.edu/nsc/resources.aspx>. If the Discretionary Fund Appeals Committee determines that the student has a valid claim, the Committee will grant the appeal. Please note, all decisions made by the committee are final.

TYPES OF FEDERAL FINANCIAL AID PROGRAMS

Federal PELL Grant

A Federal Pell Grant is a financial aid award that does not have to be repaid. Pell Grants are awarded only to undergraduate students who have not earned a bachelor's or professional degree. For many students, a Pell Grant provides a foundation of financial aid to which other aid may be added.

Effective July 1, 2012, eligibility for the Pell Grant is limited to 12 semesters of full-time payments or its equivalent. Students can track their remaining Pell Grant eligibility on www.nslds.ed.gov (National Student Loan Data System) on www.studentaid.ed.gov or through their Student Aid Report (SAR).

Awards for the academic year will depend on program funding. To be eligible, students must continue to make satisfactory academic progress and must not owe any repayment on prior Federal Pell Grants, received more than twelve semesters of full-time Pell payments, or be in default of any Federal student loans.

Disbursement information is published each academic year in the "Financial Aid Payment Calendar," available at the Financial Aid Office and online. Students are paid by check, the CUNY Scholar Support Prepaid card, or by direct deposit.

To qualify for any federal financial aid payments, students must actually begin attending classes. Before disbursing Pell

awards, enrollment status is verified. The credits for any course that a student never attended (WN grade) are not counted in calculating the enrollment status. Classes dropped after the financial aid certification date (between the 8th and 21st day of classes; WD grade) may still be counted toward student enrollment status and financial aid eligibility.

Summer Pell awards are funded from the remaining funds of the prior academic year or from funds awarded for the upcoming academic year. For more information, visit our website or download the Summer Session Information Guide, published each year, or pick up a copy at the Financial Aid Office, Namm Building, room N/G 13.

Federal Campus-Based Programs

Federal Supplemental Educational Opportunity Grant (FSEOG) Program, Federal Work Study (FWS) Program and the Federal Perkins Loan Program are considered campus-based programs, because they are administered by the University. The amount of aid students receive depends on financial need, the amount of other aid received and the availability of funds. To qualify for these programs, students must be enrolled at least half-time and be making satisfactory academic progress.

Below is a brief description of these programs:

Federal Supplemental Educational Opportunity Grants (FSEOG)

FSEOG is for undergraduates with exceptional need who have not earned a bachelor's or professional degree. As with other grants, FSEOG does not have to be paid back.

Federal Work-Study Program

The Federal Work-Study (FWS) Program provides an opportunity for students to be placed in a part-time job that will accommodate their academic schedule during the school year. FWS is awarded to students with high need. Applicants must have a FWS award and must be enrolled at least half-time (6 real or equated credits). The Financial Aid Office arranges jobs on and off campus, with public or private nonprofit agencies, for up to 20 hours a week and hosts orientation and placement sessions throughout the year. At these sessions, the work-study

program is explained and students receive help with the job selection process. Students must stop working when they have earned their total award.

Federal Perkins Loan

Loans are available to students who are maintaining satisfactory academic progress and are enrolled at least half-time (6 credits) in an approved post-secondary institution. Students must complete the FAFSA to apply. To qualify, they must complete an "entrance interview" online at <http://www.heartlandecsi.com/> for each academic year for which they are receiving the Perkins loan. Generally, only continuing students with 28 or more cumulative credits and a minimum Grade Point Average (GPA) of 2.0 are awarded Perkins Loans.

The current interest rate of 5% is not charged while students are enrolled for at least half-time study. Once students graduate, stop attending the College, or cease to be at least half-time, they must complete an "exit interview" online at <http://www.heartlandecsi.com/>. Repayment begins nine months later, at which time interest will be charged, and students are responsible for repaying the principal and the interest that accrues during the period of repayment. The period of repayment may extend over of ten years or may be shorter or can be extended during periods of hardship. For example, students can apply for a postponement or deferment of payment for a given period of time due to loss of a job. Students can also qualify for cancellation of all or part of the loan repayment for service in fields such as teaching, law enforcement and nursing.

Student's obligation to repay may be partially or totally discharged in the event of death, total and permanent disability, school closures or bankruptcy.

If students fail to make a scheduled payment when due or fail to apply for a postponement, deferment or cancellation in a timely manner, or do not comply with the terms and conditions of any loan, the College can declare the loan in default. When a loan goes into default, the student is no longer eligible for additional federal financial aid until the default is cleared and the loan is

rehabilitated. Students may rehabilitate a defaulted Perkins loan by requesting rehabilitation and by making voluntary, on-time monthly payments, as determined by the school, each month for nine consecutive months. For more information on the Perkins Loan, go to www.studentaid.ed.gov

William D. Ford Federal Direct Loan Interest Rates on Subsidized Loans and Unsubsidized Loans

The interest rate on unpaid balances of Direct Subsidized loans are based on the period of time when the loans were first disbursed.

The interest rate of Direct Subsidized loans is variable and may change on July 1st of each year, but will never exceed 8.25%.

The interest rates for Subsidized Loans and Unsubsidized Loans first disbursed on or after July 1, 2014 and before July 1, 2015 is 4.66%.

The interest rates for Subsidized Loans and Unsubsidized Loans first disbursed on or after July 1, 2013 and before July 1, 2014 is 3.86%.

For current Direct Loan interest rates, please visit <http://www.direct.ed.gov/calc.html>.

Direct Subsidized Loan and Direct Unsubsidized Loan Processing Fees:

For Direct Loans first disbursed on or after December 1, 2013 and before October 1, 2014 the processing fee is 1.072%.

For Direct Loans first disbursed on or after October 1, 2014 and before October 1, 2015, the processing fee is 1.073%. There is also a new limit on eligibility for Direct Subsidized Loans for new borrowers on or after July 1, 2013: A new borrower on or after July 1, 2013 will not be eligible for new Direct Subsidized Loans if the period during which the borrower has received such loans exceeds 150 percent of the published length of the borrower's educational program. The law also provides that a borrower reaching the 150 percent limit becomes ineligible for interest subsidy benefits on all Direct Subsidized loans first disbursed to that borrower on or after July 1, 2013.

For more information please go to www.studentloans.gov.

The Federal Direct Student Loan Program, established by the Student Loan Reform Act of 1993, provides low-interest loans for students

and parents. Under the Direct Loan Program, the federal government makes loans directly to students and parents through the College.

There are three kinds of Direct Loans available through NYCCT:

1. William D. Ford Federal Direct "Subsidized"

Loan is awarded on the basis of financial need – see "Financial Need and Expected Family Contribution (EFC)" section. For students who qualify for a Subsidized Loan, the federal government pays the interest on the loan while students are in school and during the six-month grace period after graduation or falling below half-time enrollment, on loans made prior to July 1, 2012. However, new Direct Subsidized loans made from July 1, 2012 to July 30, 2014 are not eligible for subsidized interest benefits during the six-month grace period after graduation or falling below half-time enrollment. Interest accrues during the grace period and is capitalized if unpaid by the borrower.

2. William D. Ford Federal Direct

"Unsubsidized" Loan is not awarded on the basis of need. If students qualify for an unsubsidized loan, they will be charged interest from the time the loan is disbursed until it is paid in full. Students can choose to pay the interest or allow it to accumulate. If students allow the interest to accumulate, it will be capitalized, that is, the interest will be added to the principal amount of the loan and will increase the amount that has to be repaid. If the interest is paid as it accumulates, students will have less to repay in the long run.

3. William D. Ford Federal Direct Parent Loan for Undergraduate Students (PLUS) is a loan that parents of dependent students can borrow to pay for their education.

NOTE: If your parents don't qualify for a PLUS Loan, you might be able to get additional funds up to the amount listed as an independent undergraduate student.

William D. Ford Federal Subsidized and Unsubsidized Loans

How to apply for a Direct Loan

In order to be considered for a Federal Direct Subsidized or Unsubsidized loan, students must first file the FAFSA and resolve

all problems relating to it. They must also complete the "William D. Ford Federal Direct Loans Processing Form" for the appropriate academic year. Additionally, all first time Direct Loan applicants or students who have not completed a loan entrance counseling session online, must do so before the actual loan can be processed. If a student completed an online session for another college, he or she must add New York City College of Technology to his or her school list and bring a copy of the confirmation page to the Financial Aid Office. To access the loan entrance counseling session, go to www.studentloans.gov.

How to apply for Alternative Private Loans
The certification for Alternative Loans is handled in the following manner:

1. All students must file and resolve all problems with the Free Application for Federal Student Aid (FAFSA), for the academic year for which they are applying for the loan.
2. Students must be enrolled in a program of study for at least 6 credits or equated credits.
3. If eligible, students should apply for loans through the William D. Ford Direct Loan Program.
4. Students must choose their lender and apply by using the lender's website and completing the Self-Certification Form.
5. The lender will notify the student of the results of their credit check and, if approved, will notify the school of their loan request and approved credit.
6. In determining loan amounts, no amount can exceed the cost of attendance minus other aid for the loan period. (The amount may be different from the amount the lender approved)
7. The Financial Aid Office will then certify the loan and communicate with the lender directly. If the loan is not certified, we will notify the student/student's lender of the reason(s).
8. The loan will be disbursed in two equal payments per semester. Summer disbursements will be paid when the student has completed 6 credits.

Borrowing Limits

Matriculated students enrolled in an eligible program of study with at least 6 credits may receive a Direct Loan. They must also meet other general eligibility requirements (see "Federal Student Eligibility" section).

The maximum amount that may be borrowed under the Direct Loan Program by a dependent undergraduate student for loans first distributed on or after July 1, 2008 is:

- \$5,500 for a first-year student (completed 0-29.9 credits) enrolled in a program of study that is at least a full academic year. (with a maximum of \$3,500 in subsidized loans).
- \$6,500 if that student has completed the first year of study (completed 30-59.9 credits) and the remainder of the student's program is at least a full academic year. (with a maximum of \$4,500 in subsidized loans).
- \$7,500 per year if the student is enrolled in a four-year program, has completed two years of study (completed 60 or more credits) and the remainder of the student's program is at least a full academic year. (with a maximum of \$5,500 in subsidized loans).

The maximum amount that may be borrowed under the Direct Loan Program by an independent undergraduate student is:

- \$9,500 if the student is a first-year student (completed 0-29.9 credits) enrolled in a program of study that is at least a full academic year. (with a maximum of \$3,500 in subsidized loans).
- \$10,500 if the student has completed the first year of study (completed 30-59.9 credits) and the remainder of the student's program is at least a full academic year. (with a maximum of \$4,500 in subsidized loans).
- \$12,500 per year if the student is enrolled in a four-year program, has completed two years of study (60 credits or more) and the remainder of the student's program is at least a full academic year. (with a maximum of \$5,500 in subsidized loans).

For periods of undergraduate study that are less than an academic year, the amount a student can borrow will be less than those listed above.

The total debt a student can have outstanding from all Direct Loans and Federal Family Education Loan (FFEL) Program Loans combined is:

- \$31,000 as a dependent undergraduate student. No more than \$23,000 of this amount can be in subsidized loans.
- \$57,500, as an independent undergraduate student. No more than \$23,000 of this amount can be in subsidized loans.

To view Direct Loan information including servicer information, and total loan amounts borrowed, visit <https://studentaid.ed.gov/sa/>.

William D. Ford Federal Direct Parent Loan for Undergraduate Students (PLUS)

For parent borrowers, the Direct Loan Program offers the William D. Ford Federal Direct PLUS. These loans enable parents with good credit histories to borrow to pay the educational expenses of each child who is a dependent undergraduate student enrolled at least half-time. To apply, parent must complete the "William D. Ford Federal Plus Processing Form" for the appropriate academic year. CUNY requires that students complete the FAFSA if their parents wish to apply for a PLUS.

To be eligible to receive a Direct PLUS, parents are generally required to pass a credit check. If they do not pass the credit check, they may still be able to receive a loan if someone, such as a relative or friend, is able to pass the credit check, agrees to cosign the loan and promises to repay it if the parents should fail to do so. Parents may also qualify for a loan even if they do not pass the credit check if they can demonstrate that there are extenuating circumstances. Students and their parents must also meet other general eligibility requirements for federal student financial aid.

The yearly limit on Direct PLUS is equal to the cost of attendance minus any other financial aid for which a student is eligible. For example, if a student's cost of attendance is \$6,000 and the student is eligible for \$4,000 in other financial aid, the student's parents could borrow up to, but no more than, \$2,000. The interest rate for Direct Parent PLUS Loans disbursed on or after July 1, 2014 and before July 1, 2015 is a fixed rate of 7.21%. Interest

begins accruing once the loan is disbursed and repayment begins approximately 60 days after the loan is fully disbursed. Deferment is available until 6 months after the student is no longer enrolled at least half time; however, the interest continues to accrue. (Parents must request the deferment of payments)

For loans disbursed on or after December 1, 2013 and before October 1, 2014, parents will pay a fee of 4.288 percent of the loan, deducted proportionally each time a payment is made. For loans disbursed on or after October 1, 2014 and before October 1, 2015, parents will pay a fee of up to 4.292 percent of the loan, deducted proportionally each time a loan payment is made. A portion of this fee goes to the federal government to help reduce the cost of the loans. Also, if parents do not make their loan payments as scheduled, they may be charged late fees and collection costs. There is no cumulative loan limit for PLUS. The repayment term for PLUS is 10 years. Deferment and forbearance options are available when parents are having difficulty in repaying their loan

Direct Consolidation Loans

A Direct Consolidation Loan is designed to help student borrowers to simplify loan repayment. Even though students may have several different federal student loans they will need to make only one payment per month for all the loans they consolidate. Students may even consolidate just one loan into a Direct Consolidation Loan to get benefits such as flexible repayment options.

Most federal student loans or PLUS can be consolidated. The Direct Loan Servicing Center provides students with a complete listing of eligible loans. The toll-free telephone number for the Direct Loan Servicing Center's Consolidation Department is 800.557.7392. For more information, go to the website at www.studentloans.gov.

Exit Counseling and Repaying Your Loans

Students may borrow and not begin repayment as long as they remain enrolled at least half-time. Repayment begins six months after they cease to be at least half-time students. Payment of the principal is further deferred during study under a graduate

fellowship program approved by the U.S. Commissioner of Education, during up to three years as a full-time Peace Corps or VISTA or similar national program volunteer.

Upon leaving school, or enrolling in less than 6 credits per semester, federal regulations require that students participate in an exit counseling session at www.studentloans.gov. This exit counseling session is designed to provide information regarding rights and responsibilities with regard to loan repayment, which include but are not limited to grace period, loan terms and conditions, where to send payment, payment options, conditions to defer repayment and what happens when the loan goes into default. To get an idea of what the repayment schedule might be, students can get customized estimates by using the online repayment calculators at Direct Loans on the web at www.studentloans.gov. They can also go to the National Student Loan Data System website at www.nslds.ed.gov or to <https://studentaid.ed.gov/sa/> for information on all U.S. Department of Education loans and grants.

When Students Cannot Pay the Loan

When students are having difficulty in repaying a loan, they can apply for forbearance (a temporary suspension or reduction of payments), or a deferment (delaying the repayment entirely). Deferments are granted when students are enrolled at least half-time in an approved post-secondary program or graduate fellowship program, are in rehabilitation training, are unemployed (3-year limit), or are experiencing economic hardship (3-year limit). A Federal Student Loan Ombudsman Office is available for assistance with loan problems at 1.877.557.2575 or by writing to: Ombudsman, Student Financial Assistance, U.S. Department of Education, Fourth Floor, 830 First Street, NE, Washington, DC 20202-5144.

Loan Default and Regaining Eligibility for Federal Aid

When a student does not make loan payments and has not applied for forbearance or a deferment in a timely manner, the loan goes into default. If the loan is in default, the student cannot receive federal Title IV aid, i.e., Pell Grant, loans, FWS and SEOG, until he or

she participates in one of the programs below to repay the loan:

1. **Loan Rehabilitation Program:** The student can repair damaged credit by making 12 agreed-upon, voluntary, consecutive, on-time monthly payments to HESC/Loan Servicer.
2. **Renewed Eligibility for Financial Aid Program (REFA) or Renewed Eligibility for Title IV Aid (RETA):** These programs help the student regain eligibility for all Title IV student financial aid programs. Before filing, however, the student must make 6 agreed-upon, voluntary, consecutive, on-time monthly payments to HESC/Loan Servicer, and must continue monthly payments to continue eligibility.

To find out more, the student can email defaulthelp@hesc.org or call 1.800.666.0991.

Loan Cancellation/ Forgiveness/Discharge

Under certain circumstances, a student loan, or a portion of the loan, may be canceled, forgiven, or discharged in cases such as death, total or partial disability and false certification. Students can call 1.800.666.0991 for information.

Total Withdrawals and the Return of Federal Title IV Funds

Federal regulation requires a school to calculate the amount of federal aid earned if a student begins the semester and then totally withdrawals. During the first 60% of the term, students earn Title IV funds in proportion to the time they were enrolled. If students received more aid than they earned, the unearned portion must be returned to the Department of Education. If students received less aid than the amount earned, they may be eligible for a post withdrawal disbursement.

The portion of aid students are entitled to receive is based on a percentage calculated by comparing the total number of days in the semester to the number of days completed before withdrawal. For example, students completing 20% of the semester earn 20% of the Title IV aid. Any student in that situation who had already received 100% of the Title IV aid must return the unearned 80%.

The amount to be returned is also considered an "overpayment" and must be

returned within 45 days to the Department of Education. The college returns overpayments on students' behalf; therefore, those students owe money to the college. An negative service indicator (hold) is placed on accounts until the outstanding balance is resolved. Students who remain enrolled beyond the 60% point of the term are considered to have earned all their aid and do not have to return any Title IV funds. Students who stop attending all of their courses are considered unofficially withdrawn and are only eligible for 50% of their federal aid. The College will contact students within 30 days from the College's determination date to either offer post-withdrawal disbursements or to notify the student of overpayments.

NEW YORK STATE FINANCIAL AID PROGRAMS

Tuition Assistance Program (TAP)

This grant is awarded to New York State residents who are enrolled full-time in a degree-granting program and meet the income criteria. To be eligible for a TAP award a student must:

1. be matriculated in an approved program of study and be in good academic standing. A matriculated student is one who has registered for courses and other academic activities that are recognized as contributing toward fulfilling the requirements for a specific degree or New York State recognized Certificate of at least 24 credits.
2. declare a degree major no later than 21 days from the start of the semester concerned. For the specific deadline please refer to the academic calendar at www.citytech.cuny.edu/registrar/academic-calendar.aspx. This also includes the progression from associate to baccalaureate;
 - upon completion of 30 credits, if enrolled in a two-year program (associate degree);
 - upon completion of 60 credits, if enrolled in a four-year program (baccalaureate degree)
3. be enrolled for at least twelve (12) credit hours per semester, made up of remedial and non-remedial courses that are creditable towards the degree.

This definition excludes courses not directly creditable toward the student's

degree, including AAA 1010. Please note the accelerated rate of credit accrual for subsequent payments beyond the minimum twelve credits. This is shown in the charts at the end of this section.

4. be a U.S. citizen or eligible non-citizen
5. have graduated from a high school in the U.S., or earned a GED, or passed a federally approved Ability to Benefit test as defined by the Commissioner of the State Education Department.
6. not be in default on a student loan.
7. meet income eligibility limitations.

Additionally, after receiving their first state award, students will continue to be eligible for further payments if they meet both PROGRAM PURSUIT and ACADEMIC PROGRESS requirements as outlined under NYS Academic Progress Standards.

Income Limits

Awards are made to dependent students and students who are married or have tax dependents if their NYS taxable income is \$80,000 or less; to independent students who are married and have no tax dependents and the NYS taxable income is \$40,000 or less, and to single independent students with no dependents if their NYS taxable income is \$10,000 or less.

Associate level students may receive full-time TAP awards for up to six semesters, SEEK associate level students for eight semesters, baccalaureate level students for eight semesters, and SEEK baccalaureate level students for ten semesters.

A student with a disability that prevents attendance on a full-time basis (12 credits) may be eligible to receive TAP while attending on a part-time basis (3-11 credits).

Part-Time TAP

Part-time students at approved schools in New York State who were first-time, full-time freshmen in the 2006-07 Academic Year may be eligible for Part-Time TAP beginning in 2007-08. To apply, the student must complete the FAFSA and TAP applications. To be eligible for Part-Time TAP, a student must:

- be a first-time freshman in the 2006-07 Academic Year, or thereafter.
- have earned 12 credits or more in each of

the two consecutive preceding semesters, for a minimum total of 24 credits earned.

- maintain a minimum of a "C" average (2.0 on a 4.0-point scale).
- be a U.S. citizen or eligible non-citizen; be a legal resident of NYS; be registered for 6-11 credits per semester; not be in default of a student loan and meet income eligibility limitations of TAP.

CUNY Student Tuition Assistance (CUSTA)

Students who are otherwise eligible for a maximum TAP award but whose award is reduced because they have received four semesters of payment may be eligible for a CUSTA award of up to \$100 per semester.

Aid for Part-time Study (APTS)

This award provides assistance to full-time and have not exhausted their TAP eligibility. In order to be eligible, a student must be a New York State resident and enrolled in at least six contributory credits, of which three must be non-remedial.

New York City Council Merit Scholarships

This award is a scholarship fund for high achieving students attending the City University of New York who have graduated from public and private high schools within the city. The award is funded at the level of \$800 per academic year (\$400 per academic semester).

To be eligible, students must meet the following criteria:

- Graduate from a New York City high school
- Enroll within a year of student graduation from high school as a first-time freshman
- Have a College Admissions Average (CAA) of 80 or above

For conditions of continued eligibility, students must:

1. Maintain continuous full-time enrollment within CUNY system.
2. Be limited to a maximum of six semesters of eligibility if enrolled in an associate degree program, and eight semesters if enrolled in a bachelor degree program, respectively
3. Enroll with a full-time course load per semester (12 credit/unit hours).

-
4. Earn a minimum cumulative grade point average (GPA) of a "B" or 3.00.

Reinstatement and/or leave of absence appeals can only be based on extreme extenuating circumstances, as considered by the chief college academic administrator and approved by the Chancellor/Vice Chancellor with designated authority.

NYS Academic Progress Standard Tuition Assistance Program (TAP) Eligibility Requirements:

Good academic standing for undergraduates:

- Education law requires a student whose first award year is in 2010-11 and thereafter to meet new standards of satisfactory academic progress (SAP). Those meeting the definition of "remedial student" are not subject to the new academic standards, but remain on the 2006 SAP chart. For purposes of determining whether students shall be considered remedial, the following definition has been enacted:

"Remedial student" is defined as a student:

- (a) whose scores on a recognized college placement exam or nationally recognized standardized exam indicated the need for remediation for at least two semesters, as certified by the college and approved by the State Education Department (SED); or
- (b) who was enrolled in at least six semester hours of non-credit remedial courses, as approved by the SED, in the first term he or she received a TAP award; or
- (c) who is or was enrolled in an opportunity program (HEOP, EOP, SEEK CD).

Students may continue to receive TAP if they meet both program pursuit and academic progress requirements as outlined on the following page.

Important Notes on New York State Financial Aid Eligibility

- New York State financial aid will pay for a repeated course only when a student received a prior failing grade, or if the major requires a higher grade than the student received in a particular course to satisfy degree requirements.
- Students cannot receive TAP if they are enrolled in only remedial courses. For the first TAP payment, a student must be full-

time and must carry at least twelve (12) contributory credits, of which three (3) must be non-remedial. For the second through the final TAP payment, the student must be full-time and carry at least six (6) non-remedial credits, but must have accrued considerably more credits to qualify for the next payment. See chart on following page.

- The appeal process is an option for students who become ineligible for New York State financial aid because they do not meet the "C" average (2.0) requirement for TAP payments five through ten (see Academic Progress Chart above), or because they have not met some other requirement for good academic standing as outlined above.
- The appeal is filed by completing a TAP/APTS Waiver Application for the semester the student is not in compliance with academic regulations. The waiver application form with supporting documentation is then submitted to the Office of Student Affairs in the Namm Building, room 322, for consideration by the Committee on Financial Aid Standing. Regulations allow a student to receive more than one waiver when it specifically relates to the "C" average requirement, and another one-time waiver, specifically addressing the good academic standing requirement. If the waiver is approved, the student will regain TAP eligibility for the semester for which the waiver is granted.
- The TAP/APTS Waiver Application is available at the Financial Aid Office, Namm Hall, room N/G 13.

Discretionary Fund Appeal for Lost TAP

Students who have lost TAP funding because of a documentable college advisement and/or administrative error have the option to appeal to the Discretionary Fund Appeals Committee to request funds lost as a result of the error. The Discretionary Fund Appeals Committee consists of the Director of the New Student Center and three professional advisors (including a transfer specialist); this committee will review all appeals. An appeal must be based upon circumstances resulting from the error and the appeal must include supporting documentation. The student

must follow the directions provided on the "Discretionary Fund Appeals Form," which is located in the New Student Center or on the financial aid website at <http://www.citytech.cuny.edu/nsc/resources.aspx>. If the Discretionary Fund Appeals Committee determines that the student has a valid claim, the Committee will grant the appeal.

Veteran Financial Aid Information

For information regarding Veterans Administration educational benefits for veterans, reservists and eligible dependents, please go to www.citytech.cuny.edu/veterans

Students Rights and Responsibilities

As a financial aid recipient, a student has certain rights and responsibilities. To learn more, students can download a copy of the financial aid information guide, Student Financial Aid Recipient Rights & Responsibilities, from the financial aid website at www.citytech.cuny.edu/financial-aid/ or request a copy at the financial aid office.

**PROGRAM PURSUIT CHART
FOR ALL STUDENTS**

Minimum Credits/ for TAP Payment Number:	To be eligible Equated Credits completed with grades A, B, C, D, F, S or R prior semester must be:
1	0
2	6
3	6
4	9
5	9
6	12
*7	12
*8	12
**9	12
**10	12

ACADEMIC PROGRESS CHART

For undergraduate students receiving
New York State aid prior to the
2006-2007 academic year

To be eligible for TAP Payment Number:	Minimum cumulative credits earned to date must be:	Minimum cumulative grade point average to date must be:
1	0	0
2	0	0
3	6	1.00
4	18	1.20
5	31	2.00
6	45	2.00
*7	60	2.00
*8	75	2.00
**9	90	2.00
**10	105	2.00

**ACADEMIC PROGRESS CHART
2006 STANDARDS**

(Applicable to all students receiving aid in 2007-08
through and including 2009-10 and SEEK and Remedial
students first receiving aid in 2007-08 and thereafter)

For students enrolled in Baccalaureate Degree Programs:		
To be eligible for TAP Payment Number:	Minimum cumulative credits earned to date must be:	Minimum cumulative grade point average to date must be:
1	0	0
2	3	1.1
3	9	1.2
4	21	1.3
5	33	2.0
6	45	2.0
*7	60	2.0
*8	75	2.0
**9	90	2.0
**10	105	2.0

**For students enrolled in
Associate Degree and Certificate Programs:**

To be eligible for TAP Payment Number:	Minimum cumulative credits earned to date must be:	Minimum cumulative grade point average to date must be:
1	0	0
2	3	.5
3	9	.75
4	18	1.3
5	30	2.0
6	45	2.0
*7	60	2.0
*8	75	2.0

**Must be enrolled in a four-year program unless in
the SEEK program or APTS recipient.*

***Must be a SEEK student enrolled in a four-year
program.*

ACADEMIC PROGRESS CHART

(Applicable to Non-remedial students first
receiving aid in 2010-11 and thereafter)

For students enrolled in Baccalaureate Degree Programs:		
To be eligible for TAP Payment Number:	Minimum cumulative credits earned to date must be:	Minimum cumulative grade point average to date must be:
1	0	0
2	6	1.5
3	15	1.8
4	27	1.8
5	39	2.0
6	51	2.0
*7	66	2.0
*8	81	2.0
**9	96	2.0
**10	111	2.0

**Must be enrolled in a four-year program unless in
the SEEK program or APTS recipient.*

***Must be a SEEK student enrolled in a four-year
program.*

**For students enrolled in
Associate Degree and Certificate Programs:**

To be eligible for TAP Payment Number:	Minimum cumulative credits earned to date must be:	Minimum cumulative grade point average to date must be:
1	0	0
2	6	1.3
3	15	1.5
4	27	1.8
5	39	2.0
6	51	2.0

**Must be enrolled in a four-year program unless in
the SEEK program or APTS recipient.*

***Must be a SEEK student enrolled in a four-year
program.*

Scholarships

Olliver Davis, Director
Namm Hall, room N/G 09
300 Jay Street
Brooklyn, New York 11201
Phone: 718.260.5054
email: odavis@citytech.cuny.edu

The Office of Scholarships and Residency Services assists City Tech students in locating and securing sources to fund their education. Students can apply for a number of scholarships directly through this office. In addition, staff can provide students with information about many other funding sources and can assist in computer-based searches.

In seeking funding, two things are paramount: to carefully read all descriptions and to start your search for funding early. Some prestigious, competitive scholarships may require extensive preparation before applying. Whether the scholarship you seek is big or small, local or national, specialized or general, the Office of Scholarships Services is available to assist you at each step along the way. Here are a number of the scholarships for which City Tech students may apply:

Benjamin H. Namm Scholarship:

A very limited number of grants are available to continuing students with a GPA of 2.3 or higher to assist those requiring additional financial help. Students must have applied for all relevant state and federal financial aid.

Award: Number and size of awards dependent upon funding.

Benjamin Namm Distinguished Scholars:

This scholarship is open to a freshman or a transfer student enrolled in a baccalaureate program.

Award: Up to \$1,000 per semester. Award can be used for tuition, related educational expenses, and is renewable, dependent upon academic progress and available funding.

Martin and Sharon Jaffe Scholarship:

This scholarship provides financial support to matriculated, full-time undergraduate students enrolled at City Tech. The award is offered during the fall semester and only one student is selected for the academic year.
Award: up to \$750 per semester for tuition and fees.

Patricia Sloane:

Provides support to a student enrolled in their first baccalaureate program.
Award up to \$1000 a year for educational expenses and is not renewable.

City Tech Tuition Supplement Grant:

Applicants must be NYS residents enrolled in an associate degree program. They must be in academic good standing, have completed/attempted fewer than 68 credits and have a remaining balance due for tuition only. Students must be pursuing a minimum of 6 credits. The award may be adjusted, if other funds become available. Requests for mitigating circumstances may be reviewed if a student falls below the requirements or when other funding is denied or withdrawn without the prior knowledge of the student.
Award: Up to \$35 per credit (6-11) to a maximum of \$420 (full-time) per semester.

Presidential Scholarship:

The NYCCT Foundation funds up to two Presidential Scholars in each fall freshmen baccalaureate class. Applicants must have a high school GPA of 90 or higher and combined SAT of at least 1080.
Award: Dependent upon need, up to \$2,000 per semester, and is renewable, dependent upon academic progress.

The Schiavone Construction Company Scholarship:

Open to transfers and freshmen with a high school average of 87 or higher. Must be fully CUNY certified and matriculated.
Award: up to \$1750 annually toward college tuition after all other financial aid is applied. Award can also be used for related educational expenses. Renewable, dependent upon academic progress and available funding.

Siki Ma Memorial Scholarship:

This scholarship is open to students who are enrolled in programs within the School of Professional Studies and the School of Technology and Design. Special consideration given to students in the Vision Care Technology Program with Chinese language skills and service to Chinese communities.
Award: up to \$2,000 per year for a full-time student. The scholarship can be used for tuition or related educational expenses.

University Student Senate Collegiate Merit Award:

Available to CUNY internal transfers and continuing students with 24-96 credits completed and a 3.5 GPA. Up to three awards per year. Recognizes good character, academic achievement and community service.
Award: \$1,000 per academic year.

Belle Zeller Scholarship:

This scholarship honors a founding member of the Professional Staff Congress, Dr. Belle Zeller. The scholarship is awarded to CUNY's undergraduate and graduate students who exemplify Dr. Zeller's qualities of scholarship, leadership and community service. Awards are renewable for up to three years provided recipients continue to meet the conditions of active full-time registration, attendance and grade point average.
Award: will be equal to CUNY's yearly tuition amount at senior colleges.

CityTech NSF Technology Scholarship:

This program will support low-income students for 4 years as they work to earn baccalaureate degrees in computer systems (CST), computer engineering technology (CET), electrical engineering/telecommunications engineering technology (EET).

Joyce Trowers Scholarship:

Provides financial support to Caribbean-American undergraduate continuing or transfer students majoring in applied mathematics.

May Lindenberg Scholarship:

Provides financial support to City Tech students enrolled in an associate or bachelor's degree program with serious consideration given to applicants pursuing a degree beyond the associate level.

The above list is far from complete and is subject to change. Please consult our web page: <http://www.citytech.cuny.edu/scholarships/> for more information and other scholarships and grants. The Office of Scholarships and Residency Services has the facilities that students may use to conduct internet searches for scholarships and grants. Visit Namm Hall, room N/G 09, call 718.260.5054 or address email questions to scholarshipsvcs@citytech.cuny.edu.

Registration, Grades and Records

Registration

Registrar's Office

Tasha Y. Rhodes, Registrar
Namm Hall, room N/G 15
300 Jay Street
Brooklyn, New York 11201
Phone: 718.260.5800
email: trhodes@citytech.cuny.edu

New Student Center

Angela Kavanagh, Director
Namm Hall, room N 104
300 Jay Street
Brooklyn, New York 11201
Phone: 718.260.5013
Website: <http://www.citytech.cuny.edu/nsc/>

new students

New students are advised and registered in the New Student Center.

Continuing Students

• **Web-based Registration.** Continuing students who are EAR (early advisement and registration) eligible are permitted to register during our early registration period. These students are proficient in at least two of the three skills areas required by CUNY and are not on academic probation may register online using CUNYfirst. Early registration begins in November for the spring semester and in April for the summer and fall semesters. Students who are not eligible for early registration should consult with their academic advisor.

Registration for non-EAR eligible students will take place at a later date once end of term processing is complete. Students will be notified of the late registration date via email. There is an 18-credit limit during early registration.

- **Late In-person Registration.** In-person registration occurs three times during the year:
 - January-spring classes
 - June-summer session and registration for fall
 - August-fall classes

Students should refer to the [academic calendar](#) for the late in-person registration dates. Some classes will already be filled by the time of late in-person registration.

All students are encouraged to monitor progress toward graduation by viewing their DegreeWorks Audit available on the CUNY Portal www.cuny.edu. DegreeWorks Audit is an easily accessible and user-friendly advisement tool. It compares your academic achievement to your major requirements found in the college catalog. It supplements but does not replace in-person advice from a faculty academic advisor from your major department. DegreeWorks is available on the web 24/7. More details on DegreeWorks can be found at <http://www.citytech.cuny.edu/registrar/faqs.aspx>

IMPOUNDS MUST BE CLEARED

Impounds represent debts owed to the College by students. All impounds (financial, library, etc.) must be cleared before registration. Students who have impounds will not be permitted to register, receive final grades or transcripts, etc.

PROGRAM CHANGES

Students may add or drop courses without academic penalty until the end of the program change period, noted on the academic calendar. To add or drop a course, students should first consult with their advisor, either through the New Student Center for new students or a faculty advisor for continuing students. To see a faculty advisor, start with the department advisement room and obtain a Program Change Form and authorization to change your schedule. Students must log on to CUNYfirst in order to complete the add or drop procedure. Be aware that if add/drop actions alter the number of credits for which you are registered, it may change your financial aid eligibility and the amount you must pay. If there is a change in your bill, you should make the adjustments at the bursar's office. Program

change fees are applied to changes conducted in person or online.

DROPPING COURSES AFTER THE PROGRAM CHANGE PERIOD

If you drop a course before the end of the change period, the course will not be noted on your record. If you withdraw from a course after the program change period, the grade for the course will be noted on your record as a "W" (withdrawal) grade. Dropping a course may affect your financial aid. Financial aid recipients should consult a financial aid counselor before dropping a course. Refer to the academic calendar and the sections on grades and financial aid for more details.

COURSES ON PERMIT

You are permitted to take courses at other accredited institutions while in attendance at NYCCT if you meet these requirements:

1. You may not be on academic probation;
2. During the fall or spring semester, if you are attending another institution, you must register for at least one course at NYCCT.

During the summer session, if you wish to take courses on permit at another accredited institution, you may do so without registering for courses at NYCCT at the same time.

All permit courses must be approved in the student's major department.

Taking Courses at CUNY Colleges

NYCCT students must apply for a permit to another CUNY college through CUNYfirst.

Students taking courses at other campuses within CUNY must pay tuition at this College.

Courses taken on permit at other CUNY colleges will be included on the NYCCT transcript with the grades earned. The grades will be calculated in the cumulative GPA. This applies to passing as well as to failing grades.

Taking Courses at Accredited Institutions outside of CUNY

Students wishing to take courses at an institution outside the CUNY system must request approval by submitting a form available in the Registrar's Office, room N/G 15. A permit is issued only for the courses that are creditable towards a NYCCT degree. Payment is made to the College where the course is taken.

ACADEMIC CREDIT LIMIT

The College has an academic policy limiting the credit load of students for the fall and spring semesters. The policy for students who are not on academic probation is:

1. The maximum course load for students who have not demonstrated proficiency in reading, writing and mathematics is 15 credits/equated credits. No exceptions to this maximum are permitted.
2. The maximum course load for students who have demonstrated proficiency in reading, writing and mathematics is 18 credits/equated credits. Exceptions to this policy will require a written approval from the dean and chairperson of the program in which the student is enrolled. SEEK students require similar approval from the director of SEEK. Students will not be considered for "excess credits" (for more than those spelled out above) unless they:
 - (i) are enrolled in a program which requires more than 18 credits a term; or
 - (ii) have completed 15 credits and have a cumulative index of at least 3.0.

Students who register for more than 18 credits in a semester will be required to pay an "accelerated study" fee. Students who are on academic probation should refer to the policy on Academic Probation and Dismissal.

Grades

The following procedures and policies apply to both degree and non-degree students.

Grading Procedures

- Any student record sent from another CUNY College must include a grade for each course for which a student has been officially registered and in attendance through the third academic week of the semester.
- No grade, including "W" (withdrawal), will be recorded during the first program adjustment period which is commonly considered the drop-and-add period. A withdrawal after the program adjustment period and before two thirds of the semester has elapsed will be assigned the grade of "W".

Students should consult with their advisor and with the Office of Financial Aid prior to withdrawing to determine what effect it may have on their degree completion and financial aid. Withdrawals can be made online in CUNYfirst or in-person at the Office of the Registrar.

No withdrawals from remedial courses will be permitted except in cases of administrative adjustment or, in exceptional circumstances, an approved leave of absence. Students seeking to withdraw from a remedial course must obtain the appropriate form at the registrar's office and must secure all necessary signatures. All courses or credits for which the student is officially registered at the program adjustment period of each semester (after the drop-and-add period) shall be considered attempted credits. In addition, in some departments, faculty establish special grading policies to ensure that students achieve minimum competency in their major in order to meet graduation, licensure and internship requirements.

Incomplete Grades

The grade of "I" (Incomplete) may be given by the instructor only when there is a reasonable expectation that a student can successfully complete the requirements of the course. This grade indicates that coursework or other requirements have not been fully met. This grade is a privilege and not a right. To be eligible for a grade of "I," students must complete an "incomplete grade" form with the instructor of the course. An "I" grade must be removed within one month after the beginning of the following semester, or the grade of "F" will be recorded and the student will be required to repeat the course to receive credit. Students who receive an "I" grade during the summer session are expected to remove the grade within one month after the beginning of the following fall semester.

12-Credit Policy

Remedial work must take precedence over all other work; therefore, developmental courses must be completed before the student may progress beyond 12 credits. Non-degree students are not subject to this policy.

Repeating Courses and Policy on "F" or "D" Grades

Following CUNY policy, when an undergraduate student receives the grade of "D," "F" or an administrative failing grade and the student subsequently retakes the same course at the same college and receives a grade of "C" or better, the initial grade will no longer be computed into the cumulative grade point average. However, the initial grade will remain on the transcript. The number of credits that can be deleted from the grade point average under this policy shall be limited to 16 for the duration of the student's undergraduate enrollment in institutions of The City University of New York. It is the responsibility of the student to petition the registrar if the student does not wish the failing grade to be deleted from the cumulative grade point average. The chart on the following page lists a detailed explanation of the repeat codes:

Repeat Code	Description
Average	Average, Exclude credits and include GPA
Excluded	Excluded from credits and GPA
Included	Include credits and GPA
Repeat	Repeat with permission. For students that are repeating a course that they earned a grade of "C" or better.
REXC	Exceeded the 16 credit limit. Excluded from credits and GPA

The F/D policy does not supersede the policy on repeating courses, which follows:

You may repeat only those courses in which you received a grade of "D," "F," "WA," "WF" or "WU" regardless of the requirements of your curriculum. You may not repeat a credit-bearing course within the major more than once without written permission from the chairperson of your major department or her or his designee. If the course is not offered by your major department, approval by the chairperson of the department offering the course is also required. You may not repeat courses which are a prerequisite to or the equivalent of a prerequisite to more advanced work you have completed (e.g., if you have taken CHEM 1210, you may not repeat for credit CHEM 1110). Similarly, after successfully completing a course that has prerequisites, you will not receive credit for a course that is comparable to the prerequisite you have already successfully completed or for which you have received a waiver. Students are strongly advised to consult with the Financial Aid Office in advance about the effect of repeating a course(s) on eligibility for financial assistance. Repetition of a course in which the student has received a passing grade will not count toward full-time status for financial aid purposes unless a grade higher than that previously received is explicitly required in that specific course for progression in the student's curriculum.

Forgiveness Clause

Former City Tech students who are readmitted to the College after an absence of at least ten years

and who have not attended any other colleges during this period, may have their cumulative QPA calculated without unsuccessful grades ("F," "WU" or "WF") received ten years prior to readmission. Please note that the same rule designates that the College may choose not to count for degree purposes courses taken more than ten years earlier if these courses no longer represent the competencies currently required for the degree. This determination will be made by the registrar and the academic department.

Appealing a Final Grade

A student who wishes to appeal a final grade must file an official grade appeal form. The deadline for filing an appeal is a calendar year from the date the course began; however, students are encouraged to file the appeal as soon as possible. Sample reasons for an appeal might include suspicion that a grade miscalculation has occurred or that the final grade is inconsistent with the instructor's stated grading policy.

Note: WU/WF grade appeals must be filed with the course and standards committee.

All appeals must follow these steps:

1. The student must first make an effort to resolve the matter with the course instructor. The instructor must provide the student with a clear explanation of how the assigned grade was determined.
2. If the issue cannot be resolved with the instructor, the student shall then make an appointment with the chairperson/program coordinator within a maximum of three weeks after speaking with the instructor. The chairperson/coordinator will consult with the instructor to discuss the grade within one week. The chairperson/coordinator does not have the authority to change the grade. In the case that the instructor is also the chairperson/coordinator the student should appeal to the Dean. The Dean does not have the authority to change the grade.
3. If the issue is not resolved with the chairperson/coordinator then the student has the right, within three weeks of meeting with the chairperson/coordinator, to appeal to the departmental final grade appeals committee. The chairperson/coordinator

should inform students of the fact that there is a three week deadline for appealing to the departmental committee. At this time the student must complete the appropriate official grade appeal form available from the Office of the Registrar and submit it to the registrar. Students should completely fill out the form stating the reasons for appealing a grade and attaching all supporting documentation, which should include as much graded work as possible. Incomplete forms will not be considered. For the appeal to proceed the student should also submit in writing an explanation of the steps they have taken to resolve the grade dispute and the instructor's reason for denying the request for a change of grade.

4. Both the student and instructor must provide all supporting documentation and may be asked to appear before the committee. Faculty members can make sure the documentation process is begun by always turning in the folders with attendance, grades, and the nature and weight of each grade recorded at the end of each semester. Moreover, whenever possible the committee should contact the faculty member whose grade is being challenged and ask him/her to provide an explanation of his/her decision to not change the grade. The efforts made to contact the faculty member whose grade is being appealed should be documented and should include the times and dates of the attempts as well as say whether the attempts were made via email, postal mail, home phone, and/or cell phone. The committee however is not required to consult with the student if the documentation provided by the student allows them to render a decision. Once the committee is convened, a decision must be made within three weeks. This policy does not affect the "F/D" and "I" policies that are currently in place.
5. If the majority of the committee recommends that a grade change is in order, then that decision is final and may not be appealed in any manner. If there is no majority, then the original final grade remains unchanged and may not be

appealed. The results of the appeal will be provided to the registrar and they will send a formal letter to the student. The appeals committee will also provide the results of the appeal to the chair and the instructor whose grade is being challenged.

6. In the case of an "F" or in the case where the grade does not meet the prerequisite requirement for a course that the student wants to register for in the new semester, and if the grade appeal has been filed by the student before the beginning of the new semester, then the departmental grade appeals committee should resolve the appeal before the semester begins.

7. If the instructor and/or chairperson/ coordinator are not available to comply with this process, then the student can also appeal directly through the registrar.

(Updated March 2014)

Grade Point Average

At the end of each semester, students may view their final semester grades, grade point average (GPA) and cumulative grade point average (total GPA for all semesters you have been in attendance at the College). The possible grades you might receive are:

Letter Grade	Numerical Grade Range	Quality Points (QPA)
A	93-100	4.0
A-	90-92.9	3.7
B+	87-89.9	3.3
B	83-86.9	3.0
B-	80-82.9	2.7
C+	77-79.9	2.3
C	70-76.9	2.0
D	60-69.9	1.0
F	59.9 and below	0.0
WU	Unofficial Withdrawal (attended at least once)	0.0
WF	Withdrew Failing	0.0

The following grades do not have quality points and are not computed in your GPA:

W	Official Withdrawal (no penalty. Will print on transcript.)
WA	Administrative Withdrawal (no penalty)
WN	Unofficial Withdrawal (never attended – no academic penalty. Will print on transcript.)
WD	Withdraw Drop (non-punitive grade assigned to a student when a class is dropped after the financial aid certification date but before the withdrawal period. Will not print on transcript.)
S	Satisfactory/Passing (used in developmental courses)
R	Repeat (used in developmental courses)
I	Incomplete (if work is not completed in specified time period, "I" grade will change to "F." Quality points assigned to new grade only)
Y	Course requires more than one semester and therefore the grade is not yet determined
Z	No grade submitted by instructor

The following grades are not computed in the cumulative GPA but will always appear on the transcript:

* Grades with an asterisk (*) appended are not computed in the cumulative GPA, as they represent courses not applicable to the student's current major.

Grades with a pound sign (#) appended are not computed in the cumulative GPA, as they represent grades replaced by successful repetition of the course. For students entering in the fall 2013 and thereafter please refer to the repeat rule chart to determine how your grades are computed in your cumulative GPA.

Semester Averages

To determine your semester average, multiply the quality point value of each grade by the credit value of each course. The resulting figure will be the honor point value for each course. If a course is assigned the grade of "F," "WU," include the credits in the total number of credits taken that semester. Their point

value is zero (0). Add the number of honor points earned during a semester and add the number of credits attempted. (Do not include "W" courses.) Divide the honor point total by the semester credit total. The resulting figure constitutes your semester average (GPA).

For example, if you registered for five courses during a semester and received an "A," a "B+," a "B-," a "C" and a "W," your computations will appear as follows:

Grade	Quality Points	Credits	Honors Points
A	4.0	3	12.0
B+	3.3	3	9.9
B-	2.7	3	8.1
C	2.0	3	6.0
W	0.0	0	0.0
Total	12	12	36
36 honor points divided by 12 credits equals 3.0 average.			

Cumulative Average

Your cumulative average is your grade point average (CUM GPA) from the time of your admission into the College to the present. It is computed by exactly the same method used to compute the semester index, except where modified by the D/F grade policy or by the application of the asterisk or pound sign to a grade, as described above.

ATTENDANCE AND LATENESS

Attendance and class participation are essential and excessive absences may affect the final grade. Courses with laboratory, clinical or field work may have specific attendance policies.

WITHDRAWAL

Each withdrawal can affect a student's financial aid status. If a student fails to officially withdraw from a course and simply stops attending, the student will receive a "WU" grade. If the student never attended the course, the student will receive a grade

of "WN". Further information on grades and financial aid eligibility can be obtained from the Financial Aid Office.

Students who officially withdraw during the CUNY refund period will have no grade recorded. Students who officially withdraw after the CUNY refund period but prior to the end of the designated withdrawal period (see academic calendar for specific dates) will have a grade of "W" (withdrew) recorded. After that period and continuing until the beginning of the last week of classes, a grade of "WF" (withdrew-failing) will be recorded.

Students who officially withdraw before the first day of the semester (or session for summer) will have 100% of their tuition refunded. Students who withdraw after that period will receive only a portion or no refund of their tuition (see section on tuition/fees and academic calendar for details).

The withdrawal policy is as follows:

Withdrawal from a Course

To withdraw from an individual course, the student must:

1. discuss intent with instructor;
2. discuss intent with academic advisor or with a counseling faculty member;
3. consult with the Financial Aid Office; and
4. withdraw from the class online in CUNYfirst or submit a completed Program Change form to the Office of the Registrar.

Withdrawal from a Developmental or ESOL course

To withdraw from a developmental or ESOL course a student must:

1. complete the form for this withdrawal, available at the registrar's office;
2. obtain a letter from the departmental advisor or a counselor stating any extraordinary circumstances which preclude the student's continuation in the course, with a copy of the letter sent to the departmental office, and further
3. also withdraw from any credit-bearing course having that developmental or ESOL course as a corequisite, and further;

4. bring materials mentioned above to the chair of the mathematics department for developmental mathematics courses, or the chair of the English department for developmental English courses, reading courses and ESOL courses.

5. return the completed Program Change form to the Office of the Registrar for processing.

Please note: Students withdrawing from remedial courses may not withdraw from classes online using CUNYfirst.

Withdrawal from the College

Official withdrawal from the College better protects the rights and privileges of the student than unofficial withdrawal, i.e., simply stopping attending. To withdraw officially, you must:

1. obtain a complete withdrawal form from your major department;
2. notify all of your instructors of your withdrawal;
3. obtain a withdrawal clearance/leave of absence form at the counseling center and follow the procedure outlined on the form. The withdrawal clearance procedure must be completed in person. Only in extenuating circumstances, such as personal illness, can your withdrawal be completed by mail. A withdrawal clearance which is completed by mail must be accompanied by medical or other documentation;
4. file the completed withdrawal clearance/leave of absence form and the complete withdrawal form at the registrar's office.

The date on which your withdrawal clearance/leave of absence and your complete withdrawal form are accepted and completed at the registrar's office will be considered your date of final attendance. Refunds under the policies stated in this catalog will be determined from that date. (See section on tuition and fees for details.) Where withdrawal has significant impact on the student's financial obligation to the College, additional administrative clearance may be required. If you wish to be readmitted to the College after you have withdrawn, you must file an application for readmission with the

NYCCT registrar's office prior to the semester in which you plan to return to the College. Please contact the registrar's office about deadlines for readmission.

Unofficial Withdrawal

Students who simply stop attending will receive a grade of "WU" (unofficial withdrawal – attended at least once). Students who register for a course and never attend the course will receive a grade of "WN" (unofficial withdrawal – never attended). The "WU" grade counts as an "F" in the computation of the GPA. This grade will have negative consequences for the student and should be carefully avoided.

Every withdrawal (official or unofficial) can affect a student's financial aid status. Further information can be obtained from the financial aid office.

Leave of Absence

A leave of absence is official permission to be absent from the College for one or two semesters. It allows you to be governed by the same "Statement of Requirements" in effect at the time of your leaving. A leave of absence is granted on the basis of medical (physical, psychological), financial, educational, parental, military or other personal reasons. Pick up a leave of absence/complete withdrawal form at the counseling center. After you complete it, bring it to the registrar's office along with all supporting documents. You may apply for a leave of absence at any time before the first day of the semester for which you are requesting a leave. You will not be granted a leave of absence more than once during any five-year period. To apply for an exception to these rules, you must submit a formal, written request to the registrar's office and have it reviewed by a panel consisting of the registrar, VP for enrollment and student affairs, and the chairperson of your department or someone designated in his/her place.

Records

Change of Curriculum

Students who wish to change their major must submit a change of curriculum form to the Office of the Registrar. Changes of curriculum for a current semester must be approved and submitted to the Registrar's office by the deadline as indicated on the academic calendar; after this date all curriculum changes will be applied to the following semester. For the specific deadline, please refer to the academic calendar. The academic calendar can be found at www.citytech.cuny.edu/registrar/academic-calendar.aspx. Eligibility for a curriculum change is dependent upon your academic standing and the availability of space in the curriculum to which you intend to transfer. If you meet, the transfer criteria stated in this catalog, such as prerequisite courses and CUNY requirements, and consult with a counselor/advisor, you may file the change of curriculum form with the Registrar's Office during the designated filing period.

SEEK students must consult with their SEEK advisor before making changes in curriculum.

Students who want to change from an associate degree to a bachelor degree program must have a GPA of 2.0 or higher and be CUNY certified in reading, writing, and mathematics.

Where it is the best academic decision, students may "opt in" to the most recent catalog's degree requirements by filling out a [change of catalog year form](#) and submitting it to their faculty advisor for approval. This is a one-way change; students may not later revert to their initial catalog year.

Pathways

The Pathways Initiative and the new City Tech General Education guidelines apply to students who begin at City Tech in the fall of 2013 or thereafter, and to those who return after more than one semester of absence. The new City Tech General Education guidelines will allow students to comply with the Pathways Initiative in the way most consistent with the demands of their majors. The new framework consists of a "Required Core" and a "Flexible Core". Degree requirements and the list of courses which satisfy each required area can be accessed by [clicking the links here](#). For more detailed information regarding pathways please refer to

the following link: <http://www.citytech.cuny.edu/pathways/about-pathways.aspx>.

Where it is the correct academic decision, continuing students can "opt in" to the new requirements. Please see the instructions on the "Opt In" form. The form requires the approval of an advisor in the student's major to be certain that it is the correct academic decision. Cases will be decided individually, based on major and requirements. In some cases, students returning after an absence of more than one semester may consider it preferable to remain with the graduation requirements in place at the time they first enrolled. To request permission to do so, please click on the "Opt Out" form and follow all instructions. Cases will be decided individually, based on major and requirements. For transfer students, this new system provides greater flexibility in meeting requirements and will let students feel more confident that they will receive credit for the work they have completed when they transfer between CUNY colleges. Use the "Transfer Appeal Form" if you feel that you have not received the full transfer credit to which you are entitled. If this appeal does not resolve the issue, you can appeal directly to CUNY by [clicking here](#).

Change of Address

Students should complete a change of address form in the registrar's office as soon as they have a new address to assure that they will continue to receive College mailings. Students can update their billing and mailing address online using CUNYfirst.

Please note students may not update their permanent address online using CUNYfirst.

All address changes for permanent address must be done in person at the registrar's office.

Change of Name

If you have changed your name and would like the College's records to indicate such, you must submit official documents (e.g., marriage license, court papers, etc.) to the Registrar's office.

Transcript of Records

A transcript is your official record of the courses you attempted at City Tech and the grades you received. There is a \$7.00 fee for each transcript. Transcripts forwarded to other colleges within

The City University of New York will be sent without charge. There are three ways you can obtain a copy of your transcript:

1. Online using Robo-Registrar. There is an additional \$2.00 service fee to use this service. This fee also applies to other colleges within CUNY.
2. By mail
3. Submit the transcript request form in person

The link below will provide online access to the transcript request form, and to obtain more information regarding requesting your transcript online. <http://www.citytech.cuny.edu/registrar/transcript-requests.aspx>.

Reproduction of Records Fee

The fee for reproducing a record other than your transcript will vary depending on the length and nature of the record. You may expect a fee of \$1.00 per side of a page. Consult the registrar's office for details.

Access to Records by College Personnel

Your individual academic records will be available to appropriate counselors, academic advisors, department chairpersons, deans, vice presidents and the Committee on Course and Standards. All other records are unavailable to everyone except you and the person who creates the record or who uses it for the purpose for which it was intended. In the case of legal proceedings, where a student's record is the subject of a subpoena, the College will make a reasonable effort to notify the student prior to the production of the record.

The **FREEDOM OF INFORMATION LAW** section can be found in the **IMPORTANT POLICIES AND PROCEDURE** section

Withholding of Student Records

The Board of Trustees policy with respect to the withholding of student records as amended on February 22, 1993: Students who are delinquent and/or in default in any of their financial accounts with the College, the University or an appropriate state or federal agency for which the University acts as either a disbursing or certifying agent, and students who have not completed exit interviews as required by the Federal Perkins Loan Program, the Federal Educational Loan Program, the

William D. Ford Federal Direct Loan Program and the Nursing Student Loan Program, will not be permitted to complete registration. Additionally, students will not be issued a copy of their grades, a transcript of academic record, certificate, or degree, nor will they receive funds under the federal campus based student assistance programs or the Federal Pell Grant Program unless the designated officer, in exceptional hardship cases and consistent with federal and state regulations, waives, in writing, the application of this regulation.

Review of Records

The Review of Records Appeal Committee (RORAC) reviews appeals submitted by students who have outstanding tuition charges and have encountered an unforeseen circumstance beyond their control. Students have one calendar year from the beginning of the semester in dispute to appeal outstanding tuition charges.

Review of Record Appeals must be submitted to the Office of the Registrar. All appeals require the completion of the Review of Record Appeal form, and the student must also provide supporting documentation. The outcome of the appeal will depend upon the nature of the circumstances and the supporting documentation provided. Appeals are reviewed by the committee on a monthly basis with the exception of June, August, September, January, and February (peak periods). Non-attendance appeals may require more time to review. The RORAC will send all appeal communications from the registrar@citytech.cuny.edu email address. All correspondence will be sent to your City Tech email address unless you are not a current student at the college. All committee decisions are final.

Fresh Start Program

Students who are dismissed from City Tech for failure to meet the academic standards of the college may appeal for readmission through the Fresh Start Program if they fulfill the following criteria:

- Graduated with an Associate's Degree after their dismissal from City Tech.

Additional criteria

- Must be readmitted into a Baccalaureate program

Students are not eligible to apply for Fresh Start after they have been transferred/registered for the returning semester. Students will not be retroactively placed into the Fresh Start program.

To apply, go to the Registrar's office in room NG-15 and submit a readmission form with the Fresh Start Box checked. At the time of submission, students will be required to pay the readmission fee. Students who graduate from a CUNY school do not need to submit an official transcript. Students who graduate from a non-CUNY school will be required to submit an official copy of their transcript that reflects the Associate Degree.

Once the registrar's office has received all appropriate documentation your record will be updated to pound out all of the failing grades from your original academic record at City Tech. All coursework that was successfully completed will now count as transfer credit.

If you receive financial aid, this may have an adverse impact on your Satisfactory Academic Progress (SAP) for Federal Title IV Funding. For more information, please contact Student Affairs in Namm 300 or at 718.260.4999.

Degree Requirements

DEGREES OFFERED

Associate Degrees

The College offers three degrees at the associate level: the associate in arts, the associate in science and the associate in applied science. The associate in arts is intended as a transfer degree for students who plan to continue their studies toward a bachelor's degree and who do not plan to major in math or the sciences. The associate in science is offered in arts and sciences, and in computer science. As with the associate in arts, these degrees are intended for students who plan to pursue baccalaureate studies in math, science, or health. The balance of the associate degrees offered at the College are classified as associate in applied science, and are intended for career preparation. Requirements for each of these degrees are listed on the appropriate pages of this catalog. (see chart by [clicking here](#)).

Baccalaureate Degrees

The College offers three baccalaureate degrees: the bachelor of science, the bachelor of science in education and the bachelor of technology. The requirements for each of these degrees may be found in the second half of the catalog. In addition, City Tech students are eligible to participate in the CUNY BA program, a multidisciplinary program that allows the student to take advantage of the offerings at the several CUNY campuses. It is described below.

CUNY Baccalaureate for Unique and Interdisciplinary Studies.

All units of CUNY participate in a university-wide bachelor's program which allows students, in consultation with their faculty advisors, to design majors that, while academically valid, differ from CUNY prescribed majors. Such programs will commonly combine coursework at more than one CUNY college.

If you are a matriculated City Tech student with demonstrated competence in reading, writing and mathematics, and you have completed more than 15 credits with

at least a 2.5 grade point average, you may apply to this program. If admitted, you will work with two faculty members to plan an individualized course of study.

The program requires 120 credits consisting of both lower- and upper-level courses. The program allows students to take advantage of offerings at all CUNY colleges. You may also earn up to 30 credits for relevant non-classroom work. Although the program has been developed primarily for liberal arts areas, you may also take up to 60 credits in technical or business subjects. Further information can be obtained by contacting Prof. Aaron Barlow, at 718.260.5082.

CUNY REQUIREMENTS

Proficiency in Reading, Writing and Mathematics

The Board of Trustees of The City University of New York stipulate that proficiency in reading, writing and mathematics are required for admission into any college baccalaureate program and as prerequisites for credit-bearing courses in English and mathematics. Refer to CUNY Testing Information ([click here](#)), for more detailed information. Students who have not demonstrated competency in one or more areas at the point of admission to the College will be assigned appropriate developmental and college English as a second language (ESOL) courses in preparation for college level coursework. Students must complete all required developmental and ESOL courses before they may progress beyond 12 credits of credit-bearing coursework.

Students who have not yet completed all required developmental and ESOL courses must enroll in the remaining required courses each semester until all developmental and ESOL requirements are met. Any exceptions must be approved by the Office of the Provost, via the Associate Provost.

COLLEGE REQUIREMENTS

For All Associate and Baccalaureate Degrees

- Fulfill the degree requirements listed in the catalog for the academic year in which the student was admitted to the College. Exception: Students who withdrew from the College in good standing and were readmitted must meet the degree requirements in effect at the time of their readmission. However, students who received an approved leave of absence and were absent for no more than two semesters, are eligible for consideration under the degree requirements in effect at the time of leaving. Students may also petition in writing to the Office of the Provost, Namm Hall, room N 320 for reinstatement of their original degree requirements.
- Complete the required number of credits. Generally, the associate degree requires a minimum of 60 credits, although some majors require more than the 60 minimum. A minimum of 34 credits must be completed in residence, at least 17 of which must be in the major department.

Generally, the baccalaureate degree requires a minimum of 120 credits, although some baccalaureate majors require more than the 120 minimum. A minimum of 34 post-associate degree credits must be completed in residence, at least 17 of which must be from among those listed as "Required Courses in the Major" in the catalog description of degree requirements.
- Complete all degree requirements within ten years of the date of matriculation. Exception: dental hygiene and nursing students must complete degree requirements within five years of matriculation. To request to have the ten-year rule waived to receive credit for a course taken ten or more years ago, either at NYCCT or another accredited college, petition the Committee on Course and Standards to waive the rule. The waiver form may be obtained from the Registrar's

Office which will forward it to the Committee on Course and Standards.

- Be in attendance at New York City College of Technology during the semester in which you complete the degree requirements. If one of the last courses is taken at another college (see courses on permit, [click here](#)), students are subject to the following regulations: (a) secure a permit from the registrar's office; (b) take no more than two courses on permit to complete your degree requirements; (c) you must take the last course within two years of the last date of attendance at New York City College of Technology.
- Confer with your department advisor to determine course distribution, corequisites (courses that must be taken along with another course) and prerequisites (courses that must be taken before you can take a more advanced one). A prerequisite must be completed successfully before registering for the next higher-level course that requires it; a corequisite must be taken concurrently with the course that requires it.
- Complete the core curriculum program (general education requirements) for the degree. [Click here](#) for the core curricula for the associate and the baccalaureate degrees. In some cases, your departmental requirements may narrow the choices available to satisfy the core curriculum program.

General Education/Core Curriculum and Pathways

Most colleges require that students be broadly educated beyond the boundaries of the major. This broad liberal education is essential in fostering open minds and cultivating social responsibility, as well as deepening students' background of general knowledge. At City Tech, the commitment to liberal education is expressed in our core curriculum, the set of liberal arts and sciences courses required of all students in degree-granting programs. The core curriculum at City Tech is designed to help students develop a broad knowledge base, crucial skills and aptitudes, and an awareness of ethical

and aesthetic values that are applicable to their Academic, professional and personal lives. Students are thereby better able to comprehend the content and processes of their major disciplines. Just as importantly, the courses in the core curriculum contribute to the development of students as active, lifelong learners who are able to adapt and prosper through constant change and professional evolution.

Students who begin in fall 2013 or who are returning after an absence of more than one semester will benefit from a new, shared core curriculum shared among all of the colleges of The City University of New York. The Pathways Initiative establishes parameters for a shared core curriculum and will help students advance toward degrees in a timely fashion. City Tech has gone one step further, and has utilized the Pathways framework in a way that allows students to both meet CUNY's guidelines for graduation and meet the rigorous demands of the professions for which our students prepare themselves. The degree requirements presented in this catalog both satisfy the Pathways Initiative and meet the specialized needs of City Tech students.

For more information about Pathways and the City Tech general education system, and to see lists of courses satisfying Pathways categories, [click here](#).

WRITING-INTENSIVE COURSE REQUIREMENTS

Successful entry into a career area generally requires significant writing skills. To ensure that students gain these skills, the College has added the following to the requirements for all degree programs:

- Successful completion of two writing intensive courses for the associate degree, one of which must be a course in the associate general education core and one a first-level course in the major. These courses must be completed prior to the attainment of 45 credits. For associate degree transfer students: a total of two writing-intensive courses, one in the core curriculum and one in the major.

- Successful completion of four writing-intensive courses for the baccalaureate degree: one additional course in the baccalaureate general education core plus one additional upper level course in the major, making a total of four. For baccalaureate degree transfer students: a total of four writing-intensive courses, two in the core curriculum and two in the major.

Writing-intensive courses completed successfully at other CUNY colleges or at colleges that have articulation agreements with New York City College of Technology will count toward meeting these requirements.

Writing-intensive courses can be identified when searching for classes in CUNYfirst by selecting the course attribute "Writing Intensive Course," from the drop-down menu. To learn more about the Writing Across the Curriculum program at City Tech see: <https://openlab.citytech.cuny.edu/writingacrossthecurriculum/writing-intensive-courses/>

COURSE SUBSTITUTION POLICY

A reasonable number of course substitutions may be permitted, provided that they meet NYCCT's core requirements, comply with any outside accreditation requirements and do not compromise the academic integrity of the degree or certificate program.

- Course substitutions that involve courses from the student's major department or courses in NYCCT "core requirements" must be approved in writing by the chair of the student's major department, the appropriate dean, and the registrar's office.
- Course substitutions involving courses from different departments must be approved in writing by the chairs of the departments involved, and the dean(s) of the appropriate school(s) and will be reviewed by the Registrar. To provide a framework for appropriate course substitution and to ensure consistency and oversight, the Registrar will keep track of all course substitutions made by (1) each individual student and (2) each program department.

FILING FOR GRADUATION

In order to graduate you must achieve a 2.00 cumulative average. In addition, several departments require other minimum standards for graduation. For example, the dental hygiene department requires a minimum grade of C in each dental hygiene course. Carefully review the requirements for your degree and check with your advisor regarding additional minimum requirements needed for graduation. During the semester in which you expect to graduate, you must file a graduation application form, available on the College website at www.citytech.cuny.edu or at the registrar's office.

Opening and closing dates for filing may be found in the academic calendar placed on the College website each semester. Your application will be reviewed and you will be notified as to whether you have met the graduation requirements. If you receive notice that you have not met all your requirements for a degree, you must reapply in a subsequent semester when the missing requirements have been satisfied.

Academic Standards, Policies and Procedures

ACADEMIC STANDARDS POLICY

Standards for the Completion of Remedial and ESOL courses:

The timely completion of remedial and college English as a Second Language (ESOL) courses is essential for student access to and success in the major department and liberal arts and sciences core courses required by their degree program. For this reason, the College and CUNY place limitations on the number of semesters within which students are permitted to complete these preparatory courses. Students are strongly urged to enroll in summer and intersession courses to shorten the time required to complete remedial and ESOL coursework.

1. Students are permitted a maximum of two attempts to complete or advance from each required remedial reading, writing, mathematics or ESOL course. USIP, summer and inter-session courses, are not counted in this limitation.

2. The CUNY Board of Trustees resolution phasing out remedial coursework at CUNY Senior Colleges permits college English as a Second Language (ESOL) students who are not otherwise remedial to enter baccalaureate programs. Such students would have:

- studied in a high school in which the language of instruction was not English and
- achieved exemption from mathematics skill testing by virtue of either a score of 500 on the SAT, or 75 on the New York State Mathematics Regents or a passing score on the CUNY Basic Skills Test in Mathematics, part 1 and 2.

ESOL students who fulfill these conditions may be admitted into baccalaureate programs. ESOL students who "are otherwise not remedial" in baccalaureate programs must take the CUNY ACT in reading and writing for placement and must pass these tests within two years (including the summer preceding and following two consecutive academic years). ESOL students

in baccalaureate programs that fail to pass these tests within two years will not be permitted to progress towards a bachelor's degree. The student may continue in an associate degree program.

3. Students who do not complete remedial or ESOL courses within the limits described in statement 1 above will be placed on academic probation after the first unsuccessful attempt and will be dismissed from the College after the second unsuccessful attempt at the same course. Further information on academic dismissal and the appeal of academic dismissal follows.

Minimum Cumulative Grade Point Average (CUM GPA) Standard

Students must maintain a cumulative grade point average greater than or equal to the following minimums:

Credits Attempted	Minimum Cumulative GPA
0 to 12	1.50
12.5 to 24	1.75
24.5 or above	2.00

Academic Alert

- Students will be placed on academic alert at the end of a semester if, for the first time during their first 18 attempted credits/equated credits of coursework, they fail to meet the College's minimum CUM GPA standard. Academic alert is provided only once during a student's college career.
- Students who meet the College's minimum CUM GPA standard at the end of the academic alert semester will be removed from academic alert.
- Students who do not meet the College's minimum CUM GPA standard at the end of the academic alert semester will be placed on academic probation.

Academic Probation

- Students not on academic probation will be placed on academic probation at the end of

a semester if they fail to meet the College's minimum CUM GPA standard and are no longer eligible for academic alert.

- Students on academic probation who meet the College's minimum CUM GPA standard at the end of the academic probation semester will be removed from academic probation.
- Students on academic probation who fail to meet the College's minimum CUM GPA standard at the end of the academic probation semester, yet complete all courses that semester with a semester grade point average of 2.25 or higher, will be allowed to remain on academic probation for an additional semester.
- Students on academic probation who fail to attain either the minimum CUM GPA standard or the semester grade point average of 2.25 at the end of the academic probation semester will be dismissed from the College. Also see "Academic Dismissal" and "Appeal of Academic Dismissal" at the end of this section.

HONORS

Outstanding scholastic achievement merits inclusion on the Dean's Honor List which is determined each fall and spring for full-time students and each spring for part-time students. To be included on the Dean's Honor List, a student must be CUNY proficient in reading, writing and mathematics and achieve a GPA of 3.5 or higher with no failures, incompletes, "R," "WU," "WF" or "WN" grades. Eligibility for Dean's Honor List will be based on the official grades recorded for the semester.

Full-time students must complete a minimum of 12 credits of quality grades in a semester to be eligible for inclusion on the Dean's Honor List. Part-time students who complete a minimum of 12 credits as part-time students in one academic year (September-June) are eligible for inclusion. Achievement of Dean's Honor List is publicized and recorded on the student's transcript.

When an institutional error such as a "Z" (no recorded grade) is removed from a student record, the student's GPA will be recomputed and the record corrected. If thereby qualified, the student's name will be placed on the Dean's Honor List.

A student who has acquired 15-60 credits with a GPA of 3.5 or better will be invited to join the National Society of Collegiate Scholars.

At graduation, associate degree program candidates who have completed at least 34 credits in residence at City Tech; 17 must be in the major department and also achieve a cumulative GPA of at least 3.30 upon their successful completion of the previous fall semester will graduate with associate honors.

Baccalaureate degree program candidates who have completed at least 60 credits in residence at City Tech, and also based upon their successful completion of the previous fall semester, will graduate with baccalaureate honors as follows:

- summa cum laude** –
a cumulative GPA of 3.80-4.00
- magna cum laude** –
a cumulative GPA of 3.50-3.79
- cum laude** –
a cumulative GPA of 3.25-3.49

Honors Scholars Program

The Honors Scholars Program at City Tech provides an exciting opportunity for students who have completed at least 16 credits with a GPA of 3.4 or better. Students who are part of our honors "community" may participate in special activities such as seminars, field trips, social events, research opportunities with faculty members, and enhanced coursework for prestigious honors credit.

INDEPENDENT STUDY

Independent study is a learning experience that allows for self-directed study relating to an area of academic or professional experience. Key elements of the course include critical analysis, application or development of ideas and concepts related to the area of inquiry and guidance by a faculty mentor. An eligible student must have a cumulative GPA of 3.00 or higher, have earned a minimum of 30 credits*,

and have completed an introductory course or sequence in the area of inquiry. Visit the forms section of the College website at <http://www.citytech.cuny.edu/registrar/important-forms.aspx> and download an application. In the semester prior to the commencement of the independent study, identify and meet with a faculty mentor to discuss and formalize the idea. Submit a completed and signed (by faculty mentor and student) application form with supporting documents to the school dean prior to the registration deadline for the semester of study. Honors Scholars and students interested in research are encouraged to apply.

Note: The course is offered for variable credit of 1-3 credits (3-9 independent study hours per week). An eligible student may enroll in this course a limit of two times. The student must have earned a minimum of 30 credits prior to the first Independent Study 9010 and 90 credits prior to a second Independent Study 9010.

TRANSFER CREDIT

With some limitations, students may be granted credit for courses completed at other accredited colleges and universities that offer courses comparable in credit and content to those offered at NYCCT, provided satisfactory grades were received (i.e., "D" or better at any other CUNY unit; "C" or better at other institutions). To earn an associate degree and qualify for associate honors at City Tech, students must complete a minimum of 34 credits in residence; 17 must be in the major department. The remaining credits needed to complete the degree may be transferred, provided they are approved for credit by NYCCT. Prospective transfer students can get a first approximation of the transfer credits they can expect by using the tools found in CUNYfirst's Student Center under "evaluate My Transfer Credit."

To receive credit for courses taken at other accredited colleges and universities, students must have official transcripts on file in the registrar's office. Student copies will not be accepted. All foreign language transcripts must be accompanied by a notarized affidavit attesting to the accuracy of the English translation. When credit is granted from another institution, the grade does not generate quality points toward the cumulative grade point average.

SECOND-DEGREE STUDENTS

A student who has already received an associate or bachelor's degree from NYCCT will receive credit toward the second degree for all applicable courses successfully completed at NYCCT. A student in continuous attendance may simply apply for a change of curriculum. If there is a break in the student's attendance at the College, however, a readmit application must be filed for second-degree status.

ALTERNATE MODES OF SATISFYING DEGREE REQUIREMENTS

Advanced Placement Program of the College Entrance Examination Board (AP)/International Baccalaureate (IB) Exam

City Tech grants credit and appropriate advanced placement to students who have taken college-level courses in secondary school and scored 3 or higher on an AP examination or 5 or higher on an IB higher-level exam. The college will award 30 credits to students who have completed an IB diploma with a score of 30 or higher. Official transcripts must be submitted to the Office of the Registrar. Check with the relevant department or with the Office of the Registrar for more information.

College-Level Examination Program at the College Entrance Examination Board (CLEP).

The College grants credit to students who score at or above the mean scores for "C" students on the CLEP national norms in several areas, including some of the courses in mathematics, natural sciences, social science and history. Course equivalents, credits to be granted and required scores for CLEP examinations will be determined by the department in which similar subjects are offered.

Examinations Administered by City Tech

In some departments, students can also earn credit by successfully completing examinations which are offered for certain courses. These examinations are consistent with the objectives and syllabi of the courses. Eligibility criteria and the nature, content and grading of each examination are determined

by the departmental faculty and must be approved by the provost. Before you take any examination other than one of those listed above, check with the registrar's office to see if you will be granted credit.

Exemption from Required Courses

In rare cases, students may be exempt from a required course if the skill or knowledge gained through previous academic work or other appropriate experience indicates that attending such a course is unnecessary. In order to receive an exemption, students must file an exemption request form directly with the appropriate department. Requests for exemption must be substantiated by letters from employers or other organizations attesting to the nature of the experience. Students may also sometimes be granted an exemption on the basis of coursework completed for which credit cannot be allowed. In every case, however, exemption from a course will be granted only after students demonstrate suitable proficiency in that course by completing an examination given by the department offering the course and approved by the provost.

You must substitute an equal number of elective credits when the granting of the exemption results in earning fewer than 60 credits towards the associate degree or fewer than 120 credits toward the bachelor of science, bachelor of science in education or bachelor of technology degree. Without these elective credits, you will not meet the basic New York State requirements for an associate degree or a bachelor's degree.

Alternate Format Advanced Standing

Alternate Format Advanced Standing applies to adults who have been out of high school for at least five years, have a high school diploma or GED, and are eligible for advanced standing degree-credits that may be granted for relevant work and life experience. This opportunity is available in selected curricula. To apply, please meet with the appropriate department to discuss your eligibility. Advanced standing credits granted via Alternate Format must be certified during the first semester of a student's attendance.

ACADEMIC PROGRAMS

LISTING OF ACADEMIC PROGRAMS

The College has been authorized by the Board of Regents of the University of the State of New York to grant six degrees:

- the Associate in Applied Science (AAS),
- the Associate in Arts (AA),
- the Associate in Science (AS),
- the bachelor of science (BS),
- the Bachelor of Science in Education (BS Ed)
- the Bachelor of Technology (BTech).

In addition, students at the College are able to earn BA and BS degrees through the CUNY BA and BS programs.

LISTING OF ACADEMIC PROGRAMS

HEGIS CODE	DEGREE PROGRAM	DEGREE	DEPARTMENT
5002	Accounting	AAS	BUS
1905	Applied Chemistry	BS	CHEM
1902	Applied Computational Physics	BS	PHYS
1703	Applied Mathematics	BS	MAT
5304	Architectural Technology	AAS	ARCH
0299	Architectural Technology	BTech	ARCH
0499	Biomedical informatics	BS	BIO
5004	Business and Technology of Fashion	AS	BUS
0509	Business and Technology of Fashion	BS	BUS
0839	Career and Technical Teacher Education	BS in Ed	CTTE
5305	Chemical Technology	AS	CHEM
5309	Civil Engineering Technology	AAS	CMCE
5012	Communication Design	AAS	COMD
0601	Communication Design	BTech	COMD
5009	Communication Design Management	AAS	COMD

LISTING OF ACADEMIC PROGRAMS

HEGIS CODE	DEGREE PROGRAM	DEGREE	DEPARTMENT
0599	Communication Design Management	BTech	COMD
0925	Computer Engineering Technology	BTech	CET
5101	Computer Information Systems	AAS	CST
5101	Computer Science	AS	MAT
0702	Computer Systems	BTech	CST
5317	Construction Management Technology	AAS	CMCE
0925	Construction Engineering Technology	BTech	CMCE
5317	Construction Management	Cert	CMCE
5203	Dental Hygiene	AAS	DEN
5204	Dental Laboratory Technology	AAS	RESD
5310	Electrical Engineering Technology	AAS	EET
0925	Electrical Technology	BTech	EET
5311	Electromechanical Engineering Technology	AAS	CET
1099	Emerging Media Technology	BTech	ENT
1007	Entertainment Technology	BTech	ENT
5317	Environmental Control Technology	AAS	ECT
0511	Facilities Management	BTech	ECT
1202	Health Services Administration	BS	HUS
5010	Hospitality Management	AAS	HMGT
0508	Hospitality Management	BTech	HMGT
5501	Human Services	AAS	HUS
2101	Human Services	BS	HUS
5303	Industrial Design Technology	AAS	MECH
5099	Legal Assistant Studies	AAS	LAW
0599	Legal Assistant Studies	BS	LAW
5649	Liberal Arts	AA	LAA
5649	Liberal Arts and Sciences	AS	LAS
5004	Marketing Management and Sales	AAS	BUS
0833	Mathematics Education	BS	MAT
5315	Mechanical Engineering Technology	AAS	MECH
0925	Mechanical Engineering Technology	BTech	MECH
5208.1	Nursing	AAS	NUR
1203	Nursing	BS	NUR
0839	Technology Teacher Education	BS in Ed	CTTE
0899.5	Technology Teacher Education Transitional C	Cert	CTTE
5212	Ophthalmic Dispensing	AAS	VCT
0699	Professional and Technical Writing	BS	ENG
5207	Radiologic Technology	AAS	RAD
1225	Radiologic Science	BS	RAD
5310	Telecommunications Engineering Technology	AAS	EET
0925	Telecommunications Engineering Technology	BTech	EET

TRANSFERRING INTO CITY TECH

The College carefully examines prior college work to be certain students receive all applicable transfer credit. Following CUNY policy, all transfer admits with an AS or AA degree from another CUNY institution will receive a minimum of 60 credits. In other cases we attempt to understand the previous course work to be certain the student receives credit in areas where competency has been gained. In addition, baccalaureate programs at City Tech have a number of articulation agreements with associate degree institutions in the New York City area. Articulation agreements both facilitate the smooth transition from associate to baccalaureate programs and provide important guidance to students about course selection at the associate degree level. Students should contact the appropriate department at City Tech or at their associate degree institution for details about these agreements.

TRANSFER OPPORTUNITIES AFTER RECEIVING THE ASSOCIATE DEGREE

Transfer within the City University

Graduates of both the associate in arts and associate in science programs are assured full transfer of all degree credits to senior colleges of The City University, including NYCCT. The associate in applied science degree programs at NYCCT prepare students for immediate employment upon receiving the AAS degree; however, many of our graduates choose to continue into baccalaureate programs either here at NYCCT or at other senior colleges. In most cases, since AAS graduates do not have as many general education credits, not all of their credits will transfer. Information on degree programs offered at other branches of The City University is contained in the Transfer Admissions Guide and applications are available in the Office of Admissions. Advice and information about transfer opportunities can also be obtained through the New Student Center/Career and Transfer in Namm Hall, room N 105.

ACADEMIC DISMISSAL

Students will be academically dismissed at the end of the fall or spring semester if they have either exceeded the limits of repetition on remedial and ESOL courses or failed to attain the required minimum CUM or semester GPA standards while on probation.

Appeal of Academic Dismissal

Dismissed students may appeal their dismissal. Appeals forms, available at the Office of the Registrar, must be completed and returned as directed by the published deadline. Students who are reinstated on appeal must meet the educational plan mandated by the appeals committee.

Students dismissed for exceeding the limits of repetition of a remedial course and reinstated by the Committee on Course and Standards must satisfactorily complete that remedial course within one semester. Failure to do so will result in dismissal without the possibility of appeal for reinstatement. Students dismissed for exceeding the limits in an ESOL course and reinstated by the Committee on Course and Standards must satisfactorily complete the ESOL course within one semester. Failure to do so will result in dismissal. However, the student is eligible to appeal to the College's Committee on Course and Standards for reinstatement.

Readmission After Academic Dismissal

Students dismissed from the College for failure to meet the academic standards set forth in this policy and not granted reinstatement on appeal may apply for readmission after a separation from the College of at least one semester. Students who wish to apply for readmission after this separation period must first submit a new appeal to the Committee on Course and Standards. If approved by the Committee, students may then apply for readmission. Students who left the College while on academic alert or probation may be readmitted to a particular program with the written approval of the program chairperson and subject to College policies as they apply to entering students at the time of readmission.

Academic Services and Special Programs

Accelerated Study in Associate Programs (ASAP)

Yelena Bondar, Director
Environmental Technology Center
Building, E203
Phone: 718-254-8624
email: asap@citytech.cuny.edu

ASAP is designed to help motivated students earn their Associate degree as quickly as possible, with a goal of graduating at least 50% of students within three years or less. ASAP at New York City College of Technology (City Tech) emphasizes enriched academic, financial and personal supports including comprehensive and personalized advisement, career counseling, tutoring, tuition waivers, MTA MetroCards and additional financial assistance to defray the cost of textbooks. Students enrolled in a program that awards an associate degree followed by a baccalaureate degree (2+2) are eligible for ASAP.*

ASAP at New York City College of Technology (City Tech) emphasizes enriched academic, financial and personal supports including comprehensive and personalized advisement, career counseling, tutoring, tuition waivers, MTA MetroCards and additional financial assistance to defray the cost of textbooks.

Program Perks

- A free monthly MetroCard
- A voucher to reduce (or eliminate) the cost of textbooks
- A tuition waiver for any gap between tuition and your financial aid award (for students in receipt of financial aid)
- A dedicated ASAP advisor to guide your progress from entry to graduation
- Special registration options that help you get the classes you need that also fit your schedule
- Opportunities to take classes with fellow ASAP students to foster community and build your network
- Enhanced career development and academic support services

For more information, visit <http://www.citytech.cuny.edu/asap/>.

Atrium Learning Center

Judith Rockway, Director
Atrium Building, room A/G 18
Phone: 718.260.5874
email: jrockway@citytech.cuny.edu

The Atrium Learning Center offers City Tech students an array of educational support services from tutorial assistance and the use of computers to a stimulating atmosphere for study and problem-solving in the company of other students with similar concerns. Typically, more than 6,000 students use Learning Center services each semester.

The Atrium Learning Center, located in the Atrium G-18, supplies tutors at specified hours for accounting, law and paralegal studies, hospitality management accounting, anatomy and physiology, biological sciences, bioinformatics, ESOL, chemistry, computer systems, math, physics, reading and writing. Tutors in computer-assisted drafting and design, architectural, civil, construction, electrical, electromechanical, computer engineering, environmental control, mechanical engineering and telecommunications technologies are on duty at selected times.

Students who wish to gain or improve skills in Microsoft Word and Excel may do so in the Atrium Learning Center at their own pace with the assistance of a super-tutor. Those candidates who pass the final test in the program are given a certificate of completion.

The Atrium Learning Center network is equipped with over 180 pc-compatible workstations, 21 Mac stations, 4 laptops for student/tutor use, a Smart Board and various printers and scanners. Software supportive of specific academic courses has been installed for student use. Windows applications such as Microsoft Office, the anatomy and physiology program ADAM, chemistry software, and AUTOCAD are also available on some stations.

Internet access is available on selected computers for research related to coursework. For the Mac stations, the Learning Center has a varied selection of graphics software supportive of the communication design curricula.

The print management system allows students to print up to 30 pages per day.

Software and handouts include lessons, drills and tests in basic literacy skills, reading, writing, math, algebra and geometry. An expanding collection of video tapes and CDs for accounting, math, writing, reading, dental hygiene and nursing can be viewed in private video rooms within the center.

Students in the health career departments are supported with a collection of textbooks, handouts, specimens, bones, microscopes, filmstrips, videos, slide/audio modules, stations for restorative dentistry students to create model teeth and computer programs to review and reinforce coursework in the health curricula. Nursing students will benefit from NCLEX test-practice software.

City Tech students may independently drop in for help or be referred to the Learning Center by an instructor or counselor. Hours of service for each semester are posted at the Learning Center. Students must present their currently validated City Tech/CUNY card to gain access the Learning Center.

The CUE Initiative

Lauri Shemaria-Aguirre, Associate Director
Atrium Building, room A/G 24
Phone: 718.260.5967
email: lshemaria@citytech.cuny.edu

Directed by the Office of the Provost, Coordinated Undergraduate Education (CUE) is an initiative established in 2004 by The City University to integrate several pre-existing CUNY-funded special programs. The CUE Initiative reduces redundancy among these programs by creating a clear organizational alignment of services and opportunities. CUE provides students with a more coherent experience by improving communication and relationships among formerly separate programs. For faculty and administrators, CUE supports the coordination of curriculum development and professional development activities.

Several special programs offered by the College with funding from The City University are part of the Coordinated Undergraduate Education (CUE) Initiative. These programs support a smooth transition from pre-freshman to college graduate. Students begin their journey through City Tech through

the New Student Center, the Counseling Services Center, Testing, and the First Year Summer Program. Additionally, the first Year Learning Communities, the Learning Center, General Education, the Faculty Center for Teaching and Learning, Writing Across the Curriculum, and the Honors Scholars Program all contribute to a solid, well-rounded college experience. These programs share a conceptual framework that guides students' development in critical thinking, communication and problem-solving abilities that help them succeed at New York City College of Technology and beyond.

First Year Programs

City Tech offers students an array of academic experiences and support services through their pre-freshman summer and freshman semesters. The First Year Summer Program (FYSP) is offered to students who have not satisfied one or more developmental skills requirements (reading, writing, ESOL or mathematics). FYSP enables students to address their developmental needs before the fall semester begins and participate in an engaging and intensive pre-freshman experience on the campus. Day and evening classes are available during June, July and August. The January Express Program offers similar opportunities to eligible students during the fall and spring semester intersession. All classes are tuition free.

First Year Learning Communities are offered to first semester City Tech students. Through an educational and social connection between two or more courses, students are able to adapt to college life more easily. This community among students and faculty within a cooperative learning experience fosters student success within a supportive environment.

Theatreworks

Prof. John Huntington, Artistic Director
Voorhees Building, room V 205
Phone: 718.260.5590
email: jhuntington@citytech.cuny.edu

Theatreworks, the resident theatre company at New York City College of Technology, is composed of students, alumni, faculty, staff and community members. Founded in 1974, Theatreworks has been recognized in the media and theater circles for its commitment to professionalism

in performance, technology and the advancement of multicultural casting and crews in plays, videos, musicals, dance and other performance events. This unique approach to theatre has given Theatreworks citywide recognition and an audience from the greater New York area. Theatreworks is now performing in the state-of-the-art Voorhees Theatre, where a haunted hotel, the Gravesend Inn, has opened each October to hundreds of spectators for over 13 years. Each spring semester a resident group is hosted on campus to work with the Theatreworks students. Student technicians receive valuable training by participating in the lighting, sound, costume, video, publicity and scenery crews for performances each year. Theatreworks alumni can be found in the professional theater, in television and concert venues, and working with many entertainment-related companies in their respective communities. For further information about Theatreworks, go to our website at Theatreworkscitytech.org.

Grace Gallery

Grace Gallery operates under the direction of the Communication Design department. It features continuing exhibitions of fine art and design by professional artists and designers, as well as periodic shows of outstanding faculty, student and alumni work. Grace Gallery is located on the 11th floor of Namm Hall and is open when exhibits are scheduled. For further information call 718.260.5175.

The Ursula C. Schwerin Library

Prof. Maura Smale, Chief Librarian
Atrium Fourth Floor
Reference Services: 718.260.5485
Circulation Desk: 718.260.5470
Website: <http://library.citytech.cuny.edu>

The City Tech Library seeks to help all members of the college community build critical research skills and connect them to knowledge in their disciplines. In support of this mission, the library offers customized information literacy instruction and provides access to a comprehensive collection of print and electronic resources.

Being able to find and evaluate information critically and ethically is vital for success in college and is a keystone of lifelong learning. Library faculty provide instruction designed to help students navigate a quickly evolving information landscape through classroom sessions and workshops, and are available for individual research consultations at the reference desk and by appointment. Library faculty also collaborate with classroom faculty to design coursework that introduces students to information literacy and critical thinking concepts and helps them to build a more nuanced understanding of how to apply these concepts to their own work. In addition to our regular instructional offerings, the library offers a series of more specialized workshops, events and exhibits each semester.

Library users have access to the library website at <http://library.citytech.cuny.edu>, where they can locate materials in the online catalog and find articles and other full-text content from our collection of databases and other resources. We also provide online research guides and tutorials. Access to the catalog and online resources is available to users on and off campus, and e-resources can be used 24 hours a day. Users also have access to the holdings of all CUNY libraries through the online catalog, and to library collections across the country through regional partnerships and Interlibrary Loan.

For the latest news from the library, visit Twitter, <https://twitter.com/citytechlibrary> and read Library Buzz, <http://library.citytech.cuny.edu/blog/>.

The Ursula C. Schwerin Library is located on the fourth and fifth floors of the Atrium Building, with entry from the fourth floor. Hours are posted on the library website.

Division of Continuing Education

Office of the Dean

Carol Sonnenblick, Dean
The Howard Building, room 403
25 Chapel Street
Phone: 718.552.1180
email: cssonnenblick@citytech.cuny.edu

Diane Romeo, Executive Director

Phone: 718.552.1163
email: dromeo@citytech.cuny.edu

Edna Casal, Secretary to the Dean

Phone: 718.552.1180
email: ecasal@citytech.cuny.edu

Mission:

To create pathways to higher education, job training and professional development; to offer programs which address the economic and workforce development concerns of the evolving New York City workplace; and to provide comprehensive learning and personal enrichment opportunities, community service programming, and customized training to serve the needs of diverse learners and business and industry partners.

Access for Women

Access for Women (AFW) is one of City Tech's gender equity initiatives addressing the under-representation of women in non-traditional technical education and occupations. AFW offers programs introducing women to educational and career options in science, technology, engineering and mathematics (STEM). Activities focus on the need for early intervention and career exploration for women and out-of-school youth. A range of activities help participants acquire greater awareness of their math and technical skills and how those abilities relate to educational and career decision making. AFW's major effort is composed of program services for women students at City Tech who have chosen to enter areas of study in non-traditional technical fields; assistance to these students is provided through activities that promote professional development, college retention and career placement.
For information call 718.552.1131

Academy for Occupational Health and Construction Safety

The Academy for Occupational Health and Construction Safety was created in 2006 in response to NYC's focus on construction safety and the promulgation of new regulations by the Department of Buildings (DOB) for safety training for scaffold users. Since that time, the DOB has increased the frequency of new safety compliance legislation and the Academy has responded by offering a full range of safety courses, many in response to Local Laws and new mandates. The College provides safety and OSHA courses for over 6,000 construction workers each year. Expanded offerings meet new general industry and EPA guidelines. The current year has brought the new FDNY-approved Construction Site Fire Safety Manager's program, as well as Crane Institute of America-certified courses.

Anthony Ruvio, Director

For information call 718.552.1117

Education Programs

Adult Learning Center

The Adult Learning Center (ALC) provides free classes to help students improve their English language, literacy and academic skills. Pre-HSE and HSE preparation courses, prepare adults for the high school equivalency examination and, hopefully, further educational or vocational training. English as a Second Language (ESOL) classes from beginning to advanced offer adult immigrants the opportunity to improve their English language communication skills. A transition course for advanced ESOL students prepares them to move into Pre-HSE or HSE classes, to enter the CUNY Language Immersion Program or to apply to college. The ALC serves over 1000 adults each year.

Gilberto Girena, Director

Miriam Edwin, Assistant Director

For information call 718.552.1140

Business and Industry Training Center (BITC)

BITC has served large and small businesses, unions, public agencies, non-profit organizations and professional associations for over 25 years. It offers a wide range of custom-tailored programs from basic workplace competencies to sophisticated technology and managerial training. Its offerings in collaboration with academic departments include degree programs and credit certificates/courses that are customized to meet the complex skills sets and educational needs of the city's diverse industrial and business base. Drawing on the knowledge of field experts, college faculty, and resources from private and public sectors, BITC also provides training needs assessment, testing and skills assessment and curriculum development. BITC is an active participant in many city and borough-wide economic and workforce development initiatives and has an extensive network of strategic partners and alliances.

Yelena Melikian, Director

For information call 718.552.1150

Continuing Studies Center (CSC)

Continuing Studies Center courses and intensive training programs are available to the general public and provide career-enhancing skills for adults in a competitive job market. Reasonably priced courses range from preparation for new careers such as Pharmacy Technicians, Direct Care Professionals and Dental Assistants to certificate programs in A+ certification preparation, Refrigeration Mechanics and Construction Safety. CSC works collaboratively with the College's academic departments to develop professional education courses in nursing, radiologic imaging, engineering and architecture. The department is approved by municipal and state licensing authorities to offer qualifying courses in fields including driving instructor education, fire safety, emergency action plan director, real estate and food handling. CSC offers classes in sustainability such as: Solar Hot Water,

Photovoltaic Installation, Green Roofs/Living Walls, and Wind Turbines. CSC also offers personal enrichment courses to enhance quality of life.

Charles Johnston, Director

**David Pedreira, Assistant Director
of Health Care Program**

For information call 718.552.1170

and job placement, and program development with community-based organizations. Training programs for targeted populations are offered through WDC.

Chuck Hoffman, Director

Shermira Busby-Forrester, Assistant Director

For information call 718.552.1120

CUNY Language Immersion Program

The CUNY Language Immersion Program (CLIP) provides newly admitted CUNY students who are not native English speakers the opportunity to spend an intensive period improving their English language skills in an academic environment before enrolling in credit-bearing courses. The program offers both day and evening classes, and each class meets for 25 hours a week. Reading, writing, listening and speaking are integrated into a holistic, content-based approach to language development. The goal is to substantially reduce the number of semesters of non-credit coursework that ESOL students will need in order to achieve success in credit-bearing courses, and, for those entering CLIP at higher levels of language proficiency, to avoid non-credit courses completely. The program is also open to some college students who have not been successful in their college ESOL classes. CLIP offers these students an opportunity to remain at City Tech and try to reach the level of English language skills required to be successful in the college. While enrolled in CLIP, students defer College admission and do not use their financial aid.

Gilberto Gerena, Director

For information call 718 552-1114

Workforce Development Center

In its 20th year, the Workforce Development Center (WDC) – provides a broad range of workforce development and employment preparation, skills training and job placement services to students within the Division of Continuing Education and to educationally and economically disadvantaged residents and incumbent workers throughout New York City. The services include outreach, recruitment, intake, assessment, information and referral, career exploration, individual counseling, case management, skills training, job readiness, job development

Collaborative Precollege Programs

Office of Collaborative Precollege Programs

Ivonne Barreras, Director
Midway Building, room M 309
250 Jay Street
Brooklyn, NY 11201
Phone: 718.260.5212
email: ibarreras@citytech.cuny.edu

The following programs are offered in collaboration with New York City public schools. These partnership programs are designed to improve student success rates in post-secondary education through awareness and preparatory courses:

College Now

College Now is a comprehensive collaborative program of CUNY and the NYC Department of Education designed to bridge secondary and post-secondary education. As a pathway between high school and higher education, College Now at City Tech recruits students from designated high schools for enrollment into this college transition program. It offers college credit-bearing coursework without tuition, book fees or other costs to

high school students. Classes meet after the regular high school day and/or on Saturday. Our goals are to increase students' awareness of the demands of higher education, prepare them to enter post-secondary education without remediation, and facilitate a smooth transition between high school and college.

STEP

Through STEP (Science and Technology Entry Program), City Tech offers cognitive and affective strategies to 150 middle and high school students annually to promote awareness, interest and preparation for college and to prepare students who are interested in the fields of health, science, math and technology. The program emphasizes service to traditionally underrepresented populations (in particular, Latino males) in STEM (Science, Technology, Engineering and Mathematics) and NYS Education Department-licensed careers. The program is funded by the New York State Education Department

and partners with the NYC Department of Education middle and high schools, as well as post-secondary schools and programs including academic departments at City Tech. The program provides for instruction in math, science, regents and SAT prep, and instructional technology; tutoring, counseling and advisement; trips to post-secondary institutions; and career-oriented internships and research opportunities.

Teacher/Leader Quality Partnership

The TLQP project is a professional development program prepared in conjunction with the NYC Department of Education to support curriculum development. Participating NYC public school teachers receive tuition reimbursement for graduate-level courses, as well as professional development focused on integrating technology into high school mathematics curriculum.

Brooklyn Educational Opportunity Center (SUNY Brooklyn EOC/BEOC)

Jacinth Hanson, Executive Director
State University of New York
Brooklyn Education Opportunity Center
111 Livingston Street, suite 300
Brooklyn, NY 11201
Phone: 718.802.3300
Fax: 718.802.3381
email: admissions@beoc.cuny.edu
Website: <http://www.bkl.sunyeoc.org/>

The Brooklyn Educational Opportunity Center (BEOC), established in 1966, is part of a New York State network of educational institutions funded by the University Center for Academic and Workforce Development/State University of New York (UCAWD/SUNY) offering academic and career and technical programs. BEOC is locally administered by the New York City College of Technology/City University of New York (NYCCT/CUNY). In its long history, Brooklyn EOC has provided tuition-free education and training

in a number of academic, developmental, and career programs to academically underprepared and economically underserved adults including the New York City immigrant population. While BEOC serves all of New York City, its primary focus is on the borough of Brooklyn and its mission is to provide a quality educational experience that assists students in realizing their dreams and goals to achieve economic self-sufficiency. Tuition is free to all eligible students.

BEOC's programming and operations are technology driven, giving its students cutting edge skills and allowing its staff to work in an efficient manner.

Current offerings include:

- High School Equivalency Preparation
- English as a Second Language
- College Preparation

- Medical Assisting
- Medical E-Records and Office Administration
- Hospitality Operations and Management
- Skills and Employment Training
- Security Guard Training

Digital proficiency, information literacy, and financial education are part of every student's learning experience. In addition, we have developed a strong academic and non-academic support system to enhance our students' professional success, career development, and internship/job placement assistance.

- BEOC is a New York State Certified Official TASC Test Site
- BEOC provides intervention/remedial instruction in mathematics, reading, and writing to prospective and current CUNY students

-
- BEOC is a Work Readiness Credential Test Site

BEOC curricula are aligned with industry/academic certifications and other formal assessments of student preparedness, knowledge and skills:

- COMPAS/CAT (CUNY) – Reading, Writing, and Mathematics
- Microsoft Digital Literacy Certificate
- MCAS – Microsoft Certified Applications Specialist – Word and Excel
- GED – General Educational Development Diploma Examination
- CBCS/NHA – Certified Billing and Coding Specialist
- CMAA/NHA – Certified Medical Administrative Assistant
- CET/NHA – Certified EKG Technician
- CEHRS/NHA – Certified Electronic Health Records Specialist
- CPT/NHA – Certified Phlebotomy Technician
- First Aid/CPR/AED (Automated External Defibrillation) through American Heart Association
- National Restaurant Association (NRA) ManageFirst Hospitality and Restaurant Management
- National Restaurant Association (NRA) ManageFirst Customer Service

BEOC hosts a Technology Center (ATTAIN Labs) on its campus. In addition, it has established a number of successful partnerships with other academic, educational, and business entities.

To qualify for admission, one must be a New York State resident 18 years of age or older, and meet both New York State and BEOC educational and income requirements.

Office of Student Affairs

Namm Building, room N322

Phone: 718-260-5430

Email: studentaffairs@citytech.cuny.edu

The Office of Student Affairs, in collaboration with our colleagues across campus, creates engagement opportunities that promote student development, support retention, and prepare students to be engaged global citizens and future leaders in technological and professional careers. Additionally, the office is responsible for upholding the College's community standards by enforcing the Henderson Rules to Maintain Public Order and Campus Codes of Conduct and other student conduct processes and managing behavioral and early intervention processes. Further, the office is responsible for monitoring compliance among the student services areas and supporting the service delivery and programming efforts of the student affairs units.

Special Programs

The CUNY EDGE Program (Educate, Develop, Graduate and Empower)

Marling Sone, Director
General Building, room G 503
Phone: 718.260.5187
email: msone@citytech.cuny.edu

CUNY EDGE (Educate, Develop, Graduate and Empower) formerly known as the COPE Program, is a partnership between the New York City Human Resources Administration (HRA) and the City University of New York (CUNY). The goal is to promote a culture of academic excellence to support matriculated CUNY Students receiving public assistance to persist to graduation. The program provides ongoing individualized academic, personal and career planning to help students achieve timely graduation and secure sustainable employment. Additionally, CUNY EDGE manages the HRA Work Study Program (HWS), on-campus paid work opportunities providing students invaluable professional experience. Although HRA determines HWS eligibility, CUNY EDGE ensures appropriate assignments that align with students' majors, interest, and experience.

Vision: CUNY EDGE envisions a world in which all people have access to the educational opportunities and support they need to realize academic success and a sustainable career, and a brighter future.

Mission: CUNY EDGE's mission is to help CUNY Students who are receiving public assistance achieve academic excellence, graduate on time, and find employment.

CUNY EDGE Eligibility: Matriculated CUNY undergraduate students receiving HRA cash assistance.

HWS Eligibility: Must be a CUNY EDGE Student assigned by HRA.

CUNY EDGE Support Services:

- Individualized Academic, Personal and Career Planning
- Specialized Tutoring in Reading, Writing and Math
- HWS Placements up to 19 Hours per Week
- Completion of School Enrollment Verification Letter (W-700D)
- Assistance Maintaining HRA Compliance
- Attendance Monitoring and Verification

- Professional Development Seminars
- Summer Enrichment Academy to Promote Civic and Community Engagement
- Limited Intersession and Summer Tuition Payment
- CUNY EDGE/ Mitsui USA Full Tuition Scholarship
- Persistence/GPA Achievement Incentives
- Graduation Incentives
- Job Search Assistance

The SEEK Program

Paul Dorestant, Director
Midway Building, room M 501
Phone: 718.260.5680
Website: <http://websupport2.citytech.cuny.edu/seek/>

Established at The City University in 1964, SEEK (Search for Elevation and Education through Knowledge) is a higher-education opportunity program designed to help students reach their academic and career goals through counseling, academic support services and extra financial aid.

Two categories of students are eligible for the SEEK program:

1. First-time applicants admitted as SEEK students
2. Transfer students with a 2.0 GPA coming from SEEK and CD programs within CUNY or from HEOP or EOP programs outside of CUNY.

High school students must be New York State residents and meet SEEK's specific academic and income guidelines. Students must apply through the University Application Processing Center at the time they apply to CUNY as either freshmen or transfer students.

Academic support services include individual and group tutoring sessions led by experienced and expert tutors, a study hall where SEEK students can get expert assistance with their assignments on a walk-in basis, and a first-rate computer lab. Each SEEK student is assigned a counselor to facilitate academic planning and career exploration as well as to provide personal counseling.

SEEK students are admitted on a full-time basis, with access to all academic majors and career programs at the College.

The Center for Student Accessibility (Students with Disabilities and Learning Differences)

John Reid Currie, Director
Atrium Building, room A 237
Phone: 718.260.5143
Fax: 718.254.8539
Website: <http://www.citytech.cuny.edu/accessibility/>

The Center for Student Accessibility program provides reasonable accommodations to address the needs of self-identified students with disabilities. The office provides academic workshops, tutoring, assistive technology, and advocacy to help students with disabilities integrate fully into college life. Each student must complete an intake appointment with The Center for Student Accessibility to discuss the student's history, examine the student's documentation and discuss the needs for services and reasonable accommodations under the Americans with Disabilities Act. These services are individualized and may include, but are not limited to, priority registration and academic advisement, the use of a computer lab and support from computer lab technicians, time extensions for exams, an alternate site to take exams, American Sign Language interpreters, alternate format texts, and the use of assistive technology. The Center for Student Accessibility serves all academic majors at the college. Registration is continuous throughout the year.

Counseling and Student Services

Counseling Services Center

Cynthia Bink, Director
Namm Hall, room N 108
Phone: 718.260.5030

Website: <http://www.citytech.cuny.edu/counseling/>

Student affairs professionals provide a comprehensive array of support services to help you achieve goals that are essential to your academic, career and personal development.

The Counseling Center offers students a broad range of services designed to develop skills that will increase one's chances for academic success. In addition to general counseling services such as educational planning, career exploration and personal counseling, the center provides seminars, workshops and support groups for targeted student populations. The center also provides crisis counseling and stress management training. Special help is available for students on academic probation. Counseling Center faculty and professional staff provide detailed information about College policies, procedures and services. Students can be referred to other College offices or to community resources if additional assistance is needed, and can visit the center in person, with or without an appointment. Students can find office hours, email addresses of counselors, and additional information on the center's web site. Busy students can receive phone counseling or can communicate through email.

AAA 1010 Academic Access

1 1/2 cl hrs, 0 cr

Taught by counseling staff this course provides freshman students with an orientation to College life, assistance in the development of academic skills and a positive support system to promote self-esteem and motivation toward career goals. AAA 1010 gives students the opportunity to develop and apply critical thinking skills. The course focuses on study skills, test taking, stress and anxiety management, social/interpersonal skills, career development and managing the College's policies, procedures and resources. The course is non-contributory for financial aid purposes.

Information Desk

Aries Jones, Coordinator
Welcome Center - Atrium Building, room A 114
Phone: 718.260.5520

The Information Desk is a central clearinghouse for information about College services, policies, procedures, events and activities. The staff provides verbal and written information to students, faculty, staff and visitors. The Information Desk also publishes the student handbook, operates a poster enlargement service, manages the campus monitors and maintains literature displays outside of the Namm Hall Cafeteria.

The New Student Center

Angela Kavanagh, Director
Namm Hall, room N 104
300 Jay Street
Phone: 718.260.5013
Website: <http://www.citytech.cuny.edu/nsc/>

The New Student Center offers a program of academic advisement and career and transfer counseling for new students. Carefully trained advisors and career guidance counselors encourage students to see the connections between courses taken in their first semester and their chosen careers or professions. Students are encouraged to act on their strengths and solidify plans for the future. They are guided through the registration process and given information that will help them with not only their first semester registration, but subsequent registrations at City Tech as well.

Academic Advisement is one of the first offices a student will visit on his or her registration path. Here, students are provided with expert assistance in selecting courses for their first semester. A professional advisor meets with each student individually and explains the connection each course has with that student's major area. The registration process is not treated as a simple exercise in course scheduling, but rather a process designed to encourage student growth and development. By relying less on the mechanical aspects of advisement, the broader

context of a student's needs are addressed and discussed by the advisor and the advisee. Both transfer students and freshmen come through Academic Advisement in the New Student Center.

The Career and Transfer Services area guides students along a path of understanding and exploration of life and career goals and translating these insights into a viable plan for academic success. By integrating a student's goals and aspirations into the registration process, career counselors allow students to realistically assess their first-semester needs. These needs are then synthesized into the broader context of their educational career. Once students can realistically understand their goals, they can begin to explore the options open to them.

In keeping with this holistic approach to advisement and registration, both advisors and counselors also fulfill the role of referral agents connecting students to the many other offices within the Enrollment Management umbrella and the rest of the College. In recognizing the New Student Center as the starting point as well as a source of continuing information, students view it as a point of stability and reassurance throughout their years at City Tech.

Office of Student Recruitment

Lourdes Smith
Namm Hall, room N 104
Phone: 718.260.5508

Once you are accepted into the College, you will be invited to attend new student orientation to introduce you to the College and to acquaint you with strategies for adapting and succeeding in a new environment. You will be given an opportunity to meet other new students, returning students and faculty from your program. This informative and fun program is held during the week before classes begin.

Our Children's Center

Wendy Woods, Director
Namm Hall, room N/G 14
General Building, room G 308
Phone: 718.260.5192

Our Children's Center provides a rich educational experience for children of City Tech students. Children are encouraged to be creative and explorative. The curriculum includes block building, finger-painting, easel painting, cooking, theater arts, computer and music. Our Children's Center has a warm atmosphere in which parents play an integral part.

The day program is available for children 2.0 to 5.11 years of age; an evening and Saturday program is for children 3.0 (potty trained) to 5.11 years of age. After-school and Saturday sessions are available for children 6-10 years of age. The center, located in Namm Hall, room G 14 is open Monday-Friday 7:45 am to 10:00 pm and Saturday 8:00 am to 4:30 pm, and the center in General Building, room G 308, is open Monday-Friday 7:45 am to 6:00 pm. A reasonable fee is charged for the service.

Professional Development Center

Trang Le-Chan, Director
Atrium Building, room 114
Phone: 718.260.5050
Website: www.citytech.cuny.edu/pdc/

The mission of the Professional Development Center, known on campus as "PDC" is to help students and alumni cultivate essential competencies necessary to make informed decisions and take the necessary steps to achieve their career goals. Working closely with the Office of Public Relations, PDC facilitates interaction among undergraduate students, graduate students, alumni, employers, and organizations to create access and opportunities that help students pursue their personal and professional objectives.

Getting started on the right career path can make all the difference. The Professional Development Center is here to help make those first steps as easy as possible.

Services for Students

- One-on-One Career Coaching
- Resume and Cover Letter Critiques
- Interview Preparation and Mock Interviews

- Professional Development Workshops
- Networking Events
- Internship Opportunities
- Employment Opportunities
- On-Campus Recruiting Events
- Employer Information Sessions
- Graduate School Exploration
- Space and Technology Available for Skype Interviews and Video Interviews/ Video Conferencing Interviews

If you are interested in any of the above services, please visit our website at <http://www.citytech.cuny.edu/pdc/>. Or you can contact the Professional Development Center at 718.260.5050 or you can reach us via email at pdc@citytech.cuny.edu.

Student Wellness Center

Aries Jones, Coordinator
General Building, room G 414
Phone: 718.260.5910

The Student Wellness Center offers free on-campus immunizations and confidential health care services for City Tech students. We strive to enhance the personal lives and academic achievements of the student body through the promotion of health related activities. The Center provides basic first aid and health screenings; workshops and seminars; free weekly Chair Massages; free condoms; a private room for nursing mothers to express breast milk; and host campus-wide health related fairs and informational tabling events. We also provide health insurance information through a variety of health care insurance providers available on-campus weekly.

Our staff includes a registered nurse available Monday through Thursday, and weekly physician visits. To schedule an appointment with the nurse or the on-site physician, call 718.260.5910 or stop by the center. There is no fee for services provided on-site. Referrals are also made for services not provided on-site and fees may apply.

The Student Wellness Center contracts with Downtown Medical Services (DMS) to provide both on-and off-site medical services. Their multi-specialty medical clinic is located at 81 Willoughby Street, 4th Floor, Brooklyn, NY 11201. To schedule an appointment with DMS, call 718.522.3399.

Veteran Services Counseling

Jennifer Serrano
Certifying Officer
Registrar Office, Namm Hall, room N/G 15
Phone: 718.260.5988
email: jserrano@citytech.cuny.edu

Eric Fludd, (Army Airborne/O.E.F. Veteran)
Veterans Representative
Office of Veterans Support Services
General Building 522
Phone: 718.260.4980
email: efludd@citytech.cuny.edu

City Tech welcomes men and women who have served, or currently serve, in the United States Armed Services. Once accepted to City Tech, veterans eligible for the GI Bill can submit Veteran's benefit forms (DD214, Certificate of Eligibility) to the college's certifying official, Jennifer Serrano.

The Office of Veterans Support Service is available to help guide students through the transition from military to civilian/college student life. Individual and group meeting are held to connect Veterans with services and support in the college and community. A Veteran's Advisory Board works to link veteran students to personnel in key offices such as advisement, financial aid, counseling and admissions. For more information visit the Veterans web site at <http://www.citytech.cuny.edu/veterans/>

To make it possible for veterans who were not New York State residents prior to their military service to attend CUNY and live in New York for the required period to establish New York State residency, a new CUNY policy has been enacted. Under this new policy, veterans will be charged in-state tuition for the first eighteen months of their attendance at CUNY. This should give veterans more than enough time to establish residency under CUNY's guidelines, which require proof of residency in New York for one year and an intent to reside in New York State permanently. If the veteran does not establish residency after 18 months, he/she will no longer be entitled to pay the resident tuition rate.

Student Life and Development

Office of Student Life and Development

Dorie B. Clay, Director
General Building, room G 516
Phone: 718.260.5391

Learning and personal development occurs both inside and outside of the classroom. City Tech students participate in more than 60 student clubs and organizations, reflecting a broad range of academic and social interests.

The Office of Student Life and Development (SLD) supports City Tech's mission by promoting and guiding purposeful student engagement, fostering a sense of community, providing students with opportunities for personal growth and leadership development. We aspire to foster an inclusive environment that celebrates diversity in its many forms and enhances our students' ability to be informed, global citizens.

Working closely with student clubs and the student government association, SLD promotes full participation and access to student events and activities without regard to race, ethnicity, gender, socioeconomic status, age, religion, disability status, gender identity, sexual orientation and national origin.

Athletics, Intramurals and Recreation

Brenda Alexander, Interim Director
General Building, room 518
Phone: 718.260.5102
Website: <http://www.citytech.cuny.edu/athletics/>

Intramurals

Club hours at City Tech are held on Thursdays from 12:45 pm to 2:15 pm. During this time, competitive events include table tennis and billiards. Special events include the Annual Turkey Trot and the Fitness Competition. Intramural schedules are distributed and posted throughout the College. For further information come to the General Building, room G 518 or call 718.260.5102.

Recreation

The Recreation program provides leisure-time activities for students, faculty, staff and alumni. Special classes include fitness, martial arts and dance. Schedules are posted throughout the college. For further information, come to the recreation office in the General building, room 518 or call 718.260.5102

To participate in the recreation programs, you must obtain an activity sticker from the recreation office. In order to receive the sticker, you must show a validated City Tech ID card or alumni card and sign a Consent and Release form. The card is required at all times for the use of the facilities or participation in any of the scheduled activities.

The intramural recreation program of New York City College of Technology assumes no responsibility for the health status of its students, faculty, staff and alumni. Participation in any of these programs is at your own risk. All individuals are strongly advised to have medical check-ups before engaging in physical activity and to follow the advice of their physicians. Participants may suffer physical injury should they participate without or against medical advice.

For additional information, contact the Welcome Center in N104 at 718.260.5520

Important Policies and Procedures

GENERAL INFORMATION

STATEMENT OF NON-DISCRIMINATION

New York City College of Technology (NYCCT) is an Equal Opportunity and Affirmative Action Institution. NYCCT does not discriminate on the basis of race, color, creed, national origin, ethnicity, ancestry, religion, age, sex, sexual orientation, gender identity, marital status, legally registered domestic partnership status, disability, predisposing genetic characteristics, alienage, citizenship, unemployment status, military or veteran status or status as a victim of domestic violence in its student admissions, employment, access to programs, and administration of educational policies. The "protected classes" are defined by the federal government and The City University of New York as Black, Hispanic (including Puerto Rican), Asian/Pacific Islander, American Indian/Alaskan Native, Italian American and women. The university has and will continue to exercise affirmative action for the "protected classes."

New York City College of Technology does not discriminate against any student on the basis of pregnancy or relations conditions. Absences due to medical conditions related to pregnancy will be excused for as long as deemed medically necessary by a student's doctor and students will be given the opportunity to make up missed work. Students needing assistance can seek accommodations from John Currie, Director, Office of Student Support Services, at jcurrie@citytech.cuny.edu, room A 237 or 718.260.5143; or Patricia Cody, Esq., Title IX Coordinator, at pcody@citytech.cuny.edu, room Namm 325 or 718.260.4985.

Ms. Cody is NYCCT's Chief Diversity Officer and and Title IX Coordinator. Title IX prohibits sex discrimination in federally assisted education programs.

Ms. Cody is also the Americans With Disabilities Act and Section 504 coordinator.

POLICY ON ACCEPTABLE USE OF COMPUTER RESOURCES

Adopted January 29, 2007; amended June 25, 2012 and June 29, 2015

I. INTRODUCTION

CUNY's computer resources are dedicated to the support of the University's mission of education, research and public service. In furtherance of this mission, CUNY respects, upholds and endeavors to safeguard the principles of academic freedom, freedom of expression and freedom of inquiry.

CUNY recognizes that there is a concern among the University community that because information created, used, transmitted or stored in electronic form is by its nature susceptible to disclosure, invasion, loss, and similar risks, electronic communications and transactions will be particularly vulnerable to infringements of academic freedom. CUNY's commitment to the principles of academic freedom and freedom of expression includes electronic information. Therefore, whenever possible, CUNY will resolve doubts about the need to access CUNY Computer Resources in favor of a User's privacy interest.

However, the use of CUNY Computer Resources, including for electronic transactions and communications, like the use of other University-provided resources and activities, is subject to the requirements of legal and ethical behavior. This policy is intended to support the free exchange of ideas among members of the CUNY community and between the CUNY community and other communities, while recognizing the responsibilities and limitations associated with such exchange.

II. APPLICABILITY

This policy applies to all Users of CUNY Computer Resources, as defined in Article III below. This policy supersedes the CUNY policy titled "CUNY Computer User Responsibilities" and any college policies that are inconsistent with this policy.

III. DEFINITIONS

1. "[CUNY Computer Resources](#)" refers to all computer and information technology hardware, software, data, access and other resources owned, operated, or contracted by CUNY. This includes, but is not limited to, desktop and laptop computers, handheld devices that allow or are capable of storing and transmitting information (e.g., cell phones, tablets), mainframes, minicomputers, servers, network facilities, databases, memory, memory sticks, and associated peripherals and software, and the applications they support, such as e-mail, cloud computing applications, and access to the internet.
2. "[E-mail](#)" includes point-to-point messages, postings to newsgroups and listservs, and other electronic messages involving computers and computer networks.
3. "[Faculty](#)" includes full-time, part-time, and adjunct faculty.
4. "[FOIL](#)" is the New York State Freedom of Information Law.
5. "[Non-Public University Information](#)" has the meaning set forth in CUNY's IT Security Policies and Procedures found at [security.cuny.edu](#), namely: personally identifiable information (such as an individual's Social Security Number; driver's license number or non-driver identification card number; account number, credit or debit card number, in combination with any required security code, access code, or password that would permit access to an individual's financial account; personal electronic mail address; Internet identification name or password; and parent's surname prior to marriage); information in student education records that is protected under the Family Educational Rights and Privacy Act of 1974 (FERPA) and the related regulations set forth in 34 CFR Part 99; other information relating to the administrative, business, and academic activities and operations of the University (including employee evaluations, employee home addresses and telephone numbers, and other employee records that should be treated confidentially); and any other

information available in University files and systems that by its nature should be treated confidentially .

6. “User” means a user of CUNY Computer Resources, including all current and former users, whether affiliated with CUNY or not, and whether accessing those resources on a CUNY campus or remotely.

IV. RULES FOR USE OF CUNY COMPUTER RESOURCES

1. Authorization.

- a. Users may not access a CUNY Computer Resource without authorization or use it for purposes beyond the scope of authorization. This includes attempting to circumvent CUNY Computer Resource system protection facilities by hacking, cracking or similar activities, accessing or using another person’s computer account, and allowing another person to access or use the User’s account.
- b. Notwithstanding subsection 1.a. above, a User may authorize a colleague or clerical assistant to access information under the User’s account on the User’s behalf while away from a CUNY campus or when the User is unable to efficiently access the information on the User’s own behalf (including as a result of a disability), but delegated access will be subject to the rules of Section 10 – Security, below.
- c. CUNY Computer Resources may not be used to gain unauthorized access to another computer system within or outside of CUNY. Users are responsible for all actions performed from their computer account that they permitted or failed to prevent by following ordinary security precautions. CUNY advisories and resources are available at security.cuny.edu.

2. Purpose.

- a. Use of CUNY Computer Resources is generally limited to activities relating to the performance by CUNY employees of their duties and responsibilities, by students in connection with their college courses and activities, and by retired CUNY teaching faculty, librarians, and other retired employees approved by the college president or where the employee is a member of the Central Office staff then by the Chancellor or

his or her designee. For example, use of CUNY Computer Resources for private commercial or not-for-profit business purposes, for private advertising of products or services, or for any activity meant solely to foster personal gain, is prohibited. Similarly, use of CUNY Computer Resources for partisan political activity is also prohibited.

- b. Except with respect to CUNY employees other than faculty, where a supervisor has prohibited it in writing, incidental personal use of CUNY Computer Resources is permitted so long as such use does not interfere with CUNY operations, does not compromise the functioning of CUNY Computer Resources, does not interfere with the User’s employment or other obligations to CUNY, and is otherwise in compliance with this policy, including subsection 2.a. above. Users should be aware that personal messages, data and other information sent or received through a User’s CUNY account or otherwise residing in a CUNY Computer Resource are subject to CUNY review pursuant to Section 13 of this policy and may also be subject to public disclosure pursuant to FOIL.

3. Compliance with Law.

- a. CUNY Computer Resources may not be used for any purpose or in any manner that violates CUNY rules, regulations or policies, or federal, state or local law. Users who engage in electronic communications with persons in other states or countries or on other systems or networks may also be subject to the laws of those other states and countries, and the rules and policies of those other systems and networks. Users are responsible for ascertaining, understanding, and complying with the laws, rules, policies, contracts, and licenses applicable to their particular use.
- b. Examples of applicable federal and state laws include those addressing defamation, invasion of privacy, obscenity and child pornography, and online gambling, as well as the following:
Computer Fraud and Abuse Act
Copyright Act of 1976

Electronic Communications Privacy Act
Export control regulations issued by the U.S. Departments of Commerce, State and Treasury
Family Educational Rights and Privacy Act
FOIL
New York State Law with respect to the confidentiality of library records

- c. Examples of applicable CUNY rules and policies include those listed below. Other rules and policies may be found in the Manual of General Policy and on the CUNY Legal Affairs website:
Gramm-Leach-Bliley Information Security Program
IT Security Policies & Procedures
Policy on Maintenance of Public Order (the “Henderson Rules”)
Sexual Harassment Policy
University Policy on Academic Integrity
Web Site Privacy Policy

4. Licenses and Intellectual Property.

- a. Users may use only legally obtained, licensed data or software and must comply with applicable licenses or other contracts, as well as copyright, trademark and other intellectual property laws.
- b. Much of what appears on the internet and/or is distributed via electronic communication is protected by copyright law, regardless of whether the copyright is expressly noted. Users should generally assume that material is copyrighted unless they know otherwise, and not copy, download or distribute copyrighted material without permission unless the use does not exceed fair use as defined by the federal Copyright Act of 1976. Protected material may include, among other things, text, photographs, audio, video, graphic illustrations, and computer software. Additional information regarding copyright and file sharing is available on the CUNY Legal Affairs website.

5. False Identity and Harassment. Users may not employ a false identity, mask the identity of an account or computer, or use CUNY Computer Resources to engage in abuse of others, such as sending harassing, obscene, threatening, abusive, deceptive, or anonymous messages within or outside CUNY.

6. Confidentiality.

- a. Users may not invade the privacy of others by, among other things, viewing, copying, redistributing, posting such data to the Internet, modifying or destroying data or programs belonging to or containing personal or confidential information about others, without explicit permission to do so.
- b. CUNY employees must take precautions by following all IT Security Policies and Procedures to protect the confidentiality of Non-Public University Information encountered in the performance of their duties or otherwise.

7. Integrity of Computer Resources. Users may not install, use or develop programs intended to infiltrate or damage a CUNY Computer Resource, or which could reasonably be expected to cause, directly or indirectly, excessive strain or theft of confidential data on any computing facility. This includes, but is not limited to, programs known as computer viruses, Trojan horses, and worms. Users should consult with the IT director at their college before installing any programs on CUNY Computer Resources that they are not sure are safe or may cause excess strain.

8. Disruptive Activities.

- a. CUNY Computer Resources must not be used in a manner that could reasonably be expected to cause or does cause, directly or indirectly, unwarranted or unsolicited interference with the activity of other users, including:
 - i. chain letters, virus hoaxes or other e-mail transmissions that potentially disrupt normal e-mail service;
 - ii. spamming, junk mail or other unsolicited mail that is not related to CUNY business and is sent without a reasonable expectation that the recipient would welcome receiving it;
 - iii. the inclusion on e-mail lists of individuals who have not requested membership on the lists, other than the inclusion of members of the CUNY community on lists related to CUNY business; and
 - iv. downloading of large videos, films or similar media files for personal use.
- b. CUNY has the right to require Users to limit or refrain from other specific uses if, in the opinion of the IT director at

the User's college, such use interferes with efficient operations of the system, subject to appeal to the President or, in the case of central office staff, to the Chancellor.

9. CUNY Names and Trademarks.

- a. CUNY names, trademarks and logos belong to the University and are protected by law. Users of CUNY Computer Resources may not state or imply that they speak on behalf of CUNY or use a CUNY name, trademark or logo without authorization to do so. Affiliation with CUNY does not, by itself, imply authorization to speak on behalf of CUNY.
- b. Notwithstanding subsection 9.a. above, CUNY employees and students may indicate their CUNY affiliation on e-mail, other correspondence, and in academic or professionally-related research, publications or professional appearances, so long as they do not state or imply that they are speaking on behalf of the University.

10. Security.

- a. CUNY employs various measures to protect the security of its computer resources and of Users' accounts. However, CUNY cannot guarantee such security. Users are responsible for engaging in safe computing practices such as guarding and not sharing their passwords, changing passwords regularly, logging out of systems at the end of use, and protecting Non-Public University Information, as well as for following CUNY's IT Security Policies and Procedures.
- b. Users must report incidents of non-compliance with IT Security Policies and Procedures or other security incidents to the University Chief Information Officer and Chief Information Security Officer, and the Chief Information Officer at the affected User's college.

11. Filtering. CUNY reserves the right to install spam, anti-malware, and spyware filters and similar devices if necessary in the judgment of CUNY's Office of Information Technology or a college IT director to protect the security and integrity of CUNY Computer Resources. CUNY will not install filters that restrict access

to e-mail, instant messaging, chat rooms or websites based solely on content, unless such content is illegal, such as child pornography sites.

12. Confidential Research Information.

Principal investigators and others who use CUNY Computer Resources to collect, examine, analyze, transmit or store research information that is required by law or regulation to be held confidential or for which a promise of confidentiality has been given are responsible for taking steps to protect such confidential research information from unauthorized access or modification. In general, this means storing the information on a computer or auxiliary hard drive that provides strong access controls (passwords) and encrypting files, documents, and messages for protection against inadvertent or unauthorized disclosure while in storage or in transit over data networks. Robust encryption and passwords must be used to protect Non-Public University Information, and is strongly recommended for information stored electronically on all computers, especially portable devices such as notebook computers, Personal Digital Assistants (PDAs), and portable data storage (e.g., auxiliary hard drives, memory sticks) that are vulnerable to theft or loss, as well as for information transmitted over public networks. Software and protocols used should be reviewed and approved by CUNY's Office of Information Technology. In addition, the steps taken to protect such confidential research information should be included in submissions to the CUNY Institutional Review Board reviewing the research protocol.

13. CUNY Access to Computer Resources.

- a. Copying. CUNY may copy a User's account and/or hard drive on a CUNY Computer Resource, without monitoring or inspecting the contents of such account and/or hard drive, at any time for preservation of data or evidence, without notice to the User.
- b. General Monitoring Practices. CUNY does not routinely monitor, inspect, or disclose individual usage of CUNY Computer Resources without the User's consent. In most instances, if the University needs information located in a CUNY Computer Resource, it will simply request it from

the author or custodian. However, CUNY IT professionals and staff do regularly monitor general usage patterns as part of normal system operations and maintenance and might, in connection with these duties, observe the contents of web sites, e-mail or other electronic communications. Except as provided in this policy or by law, these individuals are not permitted to seek out contents or transactional information, or disclose or otherwise use what they have observed. Nevertheless, because of the inherent vulnerability of computer technology to unauthorized intrusions, Users have no guarantee of privacy during any use of CUNY computer resources or in any data in them, whether or not a password or other entry identification or encryption is used. Users may expect that the privacy of their electronic communications and of any materials stored in any CUNY Computer Resource dedicated to their use will not be intruded upon by CUNY except as outlined in this policy.

c. Monitoring without Notice.

- i. Categories. CUNY may specifically monitor or inspect the activity and accounts of individual users of CUNY computer resources, including individual login sessions, e-mail and other communications, without notice, in the following circumstances:
- A. when the User has voluntarily made them accessible to the public, as by posting to Usenet or a web page;
 - B. when it is reasonably necessary to do so to protect the integrity, security, or functionality of CUNY or other computer resources, as determined by the college chief information officer or his or her designee, after consultation with CUNY's chief information officer or his or her designee;
 - C. when it is reasonably necessary to diagnose and resolve technical problems involving system hardware, software, or communications, as determined by the college chief information officer or his or her designee, after consultation with CUNY's chief information officer or his or her designee;
 - D. when it is

reasonably necessary to determine whether CUNY may be vulnerable to liability, or when failure to act might result in significant bodily harm, significant property loss or damage, or loss of evidence, as determined by the college president or a vice president designated by the president or, in the case of the Central Office by the Chancellor or his or her designee, after consultation with the Office of General Counsel and the Chair of the University Faculty Senate (if a current CUNY faculty member's account or activity is involved) or Vice Chair if the Chair is unavailable;

- E. when there is a reasonable basis to believe that CUNY policy or federal, state or local law has been or is being violated, as determined by the college president or a vice president designated by the president or, in the case of the Central Office by the Chancellor or his or her designee, after consultation with the Office of General Counsel and the Chair of the University Faculty Senate (if a current CUNY faculty member's account or activity is involved) or Vice Chair if the Chair is unavailable;
- F. when an account appears to be engaged in unusual or unusually excessive activity, as indicated by the monitoring of general activity and usage patterns, as determined by the college president or a vice president designated by the president and the college chief information officer or his or her designee or, in the case of the Central Office by the Chancellor or his or her designee, after consultation with CUNY's chief information officer or his or her designee, the Office of General Counsel, and the Chair of the University Faculty Senate (if a current CUNY faculty member's account or activity is involved) or Vice Chair if the Chair is unavailable; or
- G. as otherwise required by law.

ii. Procedures. In those situations in which the Chair of the University Faculty Senate is to be consulted prior to monitoring

or inspecting an account or activity, the following procedures shall apply:

- A. if the monitoring or inspection of an account or activity requires physical entry into a faculty member's office, the faculty member shall be advised prior thereto and shall be permitted to be present to observe, except where specifically forbidden by law; and
- B. the college president or the Chancellor, as the case may be, shall report the completion of the monitoring or inspection to the Chair and the CUNY employee affected, who shall also be told the reason for the monitoring or inspection, except where specifically forbidden by law.

iii. Other Disclosure.

- A. CUNY, in its discretion, may disclose the results of any general or individual monitoring or inspection to appropriate CUNY personnel or agents, or law enforcement or other agencies. The results may be used in college disciplinary proceedings, discovery proceedings in legal actions, or otherwise as is necessary to protect the interests of the University.
- B. In addition, users should be aware that CUNY may be required to disclose to the public under FOIL communications made by means of CUNY Computer Resources whether in conjunction with University business or as incidental personal use.
- C. Any disclosures of activity of accounts of individual Users to persons or entities outside of CUNY, whether discretionary or required by law, shall be approved by the General Counsel and shall be conducted in accordance with any applicable law. Except where specifically forbidden by law, CUNY employees subject to such disclosures shall be informed promptly after the disclosure of the actions taken and the reasons for them.

iv. Annual Statement. The Office of General Counsel shall issue an annual statement of the instances of account monitoring or inspection that fall within categories D through G above. The statement shall indicate the number of such instances and the

cause and result of each. No personally identifiable data shall be included in this statement.

- v. **Privacy Policy.** See CUNY's Web Site Privacy Policy for additional information regarding data collected by CUNY from visitors to the CUNY website at www.cuny.edu.

14. Waiver of Policy

- a. A CUNY employee or student may apply to the General Counsel for an exception or waiver from one or more of the provisions of this policy. Such application may be for a single use or for periodic or continuous uses, such as in connection with a course or program. Any application for a waiver should be made prior to using the CUNY Computer Resource for the purposes described in the application.
- b. The written waiver application must state:
 - i. the policy provision or provisions for which the User is seeking a waiver;
 - ii. how the User plans to use CUNY Computer Resource to be covered by the waiver and the reasons why the User believes a waiver should be approved;
 - iii. if the waiver involves confidential research information, what steps will be taken to protect such information;
 - iv. the length of time for which the waiver is being requested; and
 - v. if a student, how and by whom the student will be supervised.
- c. The General Counsel shall consult with the CUNY's chief information officer and the president of the applicant's college (or, if the applicant is a Central Office employee, the Chancellor) or their designees, prior to making a determination regarding the application.
- d. Users should be aware that CUNY cannot waive federal, state or local law; for example, the contents of CUNY Computer Resources (including confidential research information) may be subject to a valid subpoena regardless of the terms of any waiver.

15. Enforcement.

- a. Violation of this policy may result in suspension or termination of an individual's right of access to CUNY Computer Resources, disciplinary action by appropriate CUNY authorities, referral

to law enforcement authorities for criminal prosecution, or other legal action, including action to recover civil damages and penalties.

- b. Violations will normally be handled through the University disciplinary procedures applicable to the relevant User. For example, alleged violations by students will normally be investigated, and any penalties or other discipline will normally be imposed, by the Office of Student Affairs.
- c. CUNY has the right to temporarily suspend computer use privileges and to remove from CUNY computer resources material it believes violates this policy, pending the outcome of an investigation of misuse or finding of violation. This power may be exercised only by the president of each college or the Chancellor.

16. Additional Rules. Additional rules, policies, guidelines and/or restrictions may be in effect for specific computers, systems, or networks, or at specific computer facilities at the discretion of the directors of those facilities. Any such rules which potentially limit the privacy or confidentiality of electronic communications or information contained in or delivered by or over CUNY Computer Resources will be subject to the substantive and procedural safeguards provided by this policy.

17. Disclaimer.

- a. CUNY shall not be responsible for any damages, costs or other liabilities of any nature whatsoever with regard to the use of CUNY Computer Resources. This includes, but is not limited to, damages caused by unauthorized access to CUNY Computer Resources, data loss, or other damages resulting from delays, non-deliveries, or service interruptions, whether or not resulting from circumstances under the CUNY's control.
- b. Users receive and use information obtained through CUNY Computer Resources at their own risk. CUNY makes no warranties (expressed or implied) with respect to the use of CUNY Computer Resources. CUNY accepts no responsibility for the content of web pages or graphics that are linked from CUNY web pages, for any advice or information received by a user through use of CUNY Computer

Resources, or for any costs or charges incurred by a user as a result of seeking or accepting such advice or information.

- c. CUNY reserves the right to change this policy and other related policies at any time. CUNY reserves any rights and remedies that it may have under any applicable law, rule or regulation. Nothing contained in this policy will in any way act as a waiver of such rights and remedies.

STUDENT INFORMATION

NOTIFICATION UNDER FERPA OF STUDENT RIGHTS CONCERNING EDUCATION RECORDS AND DIRECTORY INFORMATION

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. See Section 6 below to prevent the disclosure of directory information. The FERPA rights of students are:

1. The right to inspect and review your education records. Students may submit to the registrar, dean, head of the academic department, or other appropriate official, written requests that identify the record(s) they wish to inspect. If the records are not maintained by the NYCCT official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed. All requests shall be granted or denied in writing within 45 days of receipt. If the request is granted, you will be notified of the time and place where the records may be inspected. If the request is denied or not responded to within 45 days, you may appeal to NYCCT's FERPA appeals officer. Additional information regarding the appeal procedure will be provided to you if a request is denied.
2. The right to request the amendment of the student's education records that the student believes are inaccurate or misleading.

You may ask NYCCT to amend a record that you believe is inaccurate or misleading. You should write to the NYCCT official responsible for the record, clearly identify the part of the record you want changed, and specify why it is inaccurate or misleading.

If NYCCT decides not to amend the record as requested by you, NYCCT will notify you of the decision and advise you of your right to a hearing before the NYCCT FERPA appeals officer regarding the request for amendment. Additional information regarding the hearing procedures will be provided to you when you are notified of your right to a hearing. The NYCCT FERPA appeals officer is Alexis Chaconis, who can be reached at 718.260.5500 or by email at achaconis@citytech.cuny.edu.

3. The right to consent to disclosure of personally identifiable information contained in your education records, except to the extent that FERPA authorizes disclosure without consent.

One exception which permits disclosure without consent is disclosure to College officials with legitimate educational interests. A College official is a person employed by the University in an administrative, supervisory, academic, research, or support staff position; a person or company with whom the University has contracted; a person serving on the board of trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another College official in performing his or her tasks.

A College official has a legitimate educational interest if access is reasonably necessary in order to perform his/her instructional, research, administrative or other duties and responsibilities.

4. Upon request, NYCCT discloses educational records without consent to officials of another college or school in which a student seeks or intends to enroll. You may appeal the alleged denials of FERPA rights to the: General Counsel and Senior Vice Chancellor for Legal Affairs, The City University of New York, 217 East 42nd Street, New York, NY 10017
5. The right to file a complaint with the U.S. Department of Education concerning alleged failures by NYCCT to comply with the requirements of FERPA. The name and address of the office that administers FERPA are:
Family Policy Compliance Office,
U.S. Department of Education
600 Independence Avenue, SW
Washington, DC 20202-4605.

6. NYCCT will make the following "directory information" concerning current and former students available to those parties having a legitimate educational interest in the information: name, CUNY email address, full- or part-time status, enrollment status (undergraduate, graduate, etc.), level of education (credits) completed, major field of study, degree enrolled for, participation in officially recognized activities and sports, height and weight of athletic team members, and degrees, honors and awards received. By filing a form with the registrar's office you may request that any or all of this directory information not be released without your prior written consent. This form is available in the registrar's office and on the College website and may be filed, withdrawn, or modified at any time.

IMMUNIZATION REQUIREMENTS

All immunization documents must be submitted to the Admissions Office in Namm Hall, room N/G 17. Students who do not submit proof of immunization against measles, mumps and rubella will be prohibited from attending City Tech. Students who fail to submit the meningococcal meningitis response form within the statutory grace period will have a stop put on their record and may be prohibited from attending City Tech.

Measles, Mumps and Rubella Requirements

New York State Public Health Law §2165 requires all college students born on or after January 1, 1957 and who are enrolling for six or more semester hours, to show proof of immunity against measles, mumps and rubella in order to register for courses. For information regarding Veterans waivers, medical waivers/exemptions and religious exemptions, call or visit the Admissions Office.

Students are required to submit a written record of two doses of live measles vaccine, one dose of live mumps vaccine and one dose of rubella vaccine; or positive titer: a laboratory report of blood test indicating immunity to measles, mumps and rubella. Students who partially comply with the immunization requirements will be permitted to register for courses and have until the 30th day of the semester to submit the remaining requirements.

Meningococcal Meningitis Requirements

New York State Public Health Law §2167 requires all colleges and universities to provide written information about meningococcal disease and vaccination to its students. The law does not require that students be immunized against meningitis. No student will be exempted from receiving information or returning the meningococcal meningitis response form.

Students enrolled for at least six semester hours or the equivalent per semester are required to complete, sign and return a meningococcal meningitis response form by the 30th day of the semester that: (a) confirms that the College has provided the information about meningococcal meningitis; and (b) indicates that either: (1) the student has decided against receiving the vaccination; or (2) the student has received the meningococcal meningitis vaccination within the past 10 years.

To assist students with meeting the immunization requirements, we provide free on-campus immunizations and referrals to off-campus immunization clinics. For additional information, call or visit The Wellness Center, Pearl Building, room P 104 or at 718.260.5910.

POLICY STATEMENT ON INFORMATION DISCLOSURE

The following information (known as directory information) may be released to any persons within or outside the University without consent of the student:

- Name, address and telephone listing.
- CUNY email address
- Enrollment Status (full or part-time)
- Degree enrolled for
- Degrees, honors and awards received
- Participation in officially recognized sports and activities
- Physical factors (height, weight or athletes)
- Photograph

If a student does not wish the above information released, he or she must notify the registrar in writing.

Any such written request will be honored by New York City College of Technology until a written directive to the contrary is received from the student.

Information other than the above items may be given to certain individuals and agencies outside the institution without consent of the student. Records of release of such information are maintained in the student folder. Instances of such release include:

- in response to a court order or subpoena,
- in response to an institution, agency or individual providing financial aid to the student for his or her education,
- to officials and/or representatives of educational accrediting agencies or other agencies specified within the act.

Release of other information to any other third parties is prohibited without written consent of the student.

The director of admissions is the College official designated to disseminate information about admission to the College. The director of admissions can be contacted between 9:30 am and 4:30 pm Monday through Thursday, and until 3:00 pm on Friday at 718.260.5250.

The registrar is the College official designated to disseminate information about academic programs and the status of students at the College. The registrar can be contacted between 9:30 am and 4:30 pm Monday through Thursday, and until 3:00 pm on Friday at 718.260.5800.

A copy of the Request to Prevent Disclosure of Directory Information form is available online at http://www.citytech.cuny.edu/registrar/docs/prevent_disclosure_directory.pdf.

FREEDOM OF INFORMATION LAW

Requests to inspect public records at the College should be made to the Records Access Officer, Gilen Chan, Special Counsel, who is located at Namm 325, at 300 Jay Street. She may be reached by telephone at 718.260.4983 or by email at gchan@citytech.cuny.edu. Public records are available for inspection and copying by appointment only at a location to be designated. You have a right to appeal a denial of a request for access to records to the CUNY General Counsel and Senior Vice Chancellor for Legal Affairs. Copies of the CUNY Procedures for Public Access to Public Records Pursuant to Article 6 of the Public Officers Law and the appeal form are available at the reference desk of the College library and on the College website.

224-A OF THE NYS EDUCATION LAW – STUDENTS UNABLE BECAUSE OF RELIGIOUS BELIEFS TO ATTEND CLASSES ON CERTAIN DAYS

- No person shall be expelled from or be refused admission as a student to an institution of higher education for the reason that he/she is unable, because of religious beliefs, to attend classes or to participate in any examination, study or requirements on a particular day or days.
- Any student in an institution of higher education who is unable, because of his/her religious beliefs, to attend classes on a particular day or days shall, because of such absence on the particular day or days, be excused from any examination or any study or work requirements.
- It shall be the responsibility of the faculty and of the administrative officials of each institution of higher education to make available to each student who is absent from school, because of his/her religious beliefs, an equivalent opportunity to make up any examination, study or work requirements which he/she may have missed because of such absence on any particular day or days. No fees of any kind shall be charged by the institution for making available to said student such equivalent opportunity.
- If classes, examinations, study or work requirements are held on Friday after 4:00 pm or on Saturday, similar or makeup classes, examinations, study or work requirements shall be made available on other days, where it is possible and practicable to do so. No special fees shall be charged to the student for these classes, examinations, study or work requirements held on other days.
- In effectuating the provisions of this section, it shall be the duty of the faculty and of the administrative officials of each institution of higher education to exercise the fullest measure of good faith. No adverse or prejudicial effects shall result to any student because of his/her availing himself/herself of the provisions of this section.
- Any student who is aggrieved by the alleged failure of any faculty or administrative official(s) to comply in good faith with the provisions of this section shall be entitled to maintain an action or proceeding in the supreme court of the county in which such

institution of higher education is located for the enforcement of his/her rights under this section.

- A copy of this section shall be published by each institution of higher education in the catalog of such institution containing the list of available courses.
- As used in this section, the term institution of higher education shall mean schools under the control of the board of trustees of the State University of New York or of the board of trustees of The City University of New York or any community college.

THE CITY UNIVERSITY OF NEW YORK – STUDENT COMPLAINT PROCEDURE

PROCEDURES FOR HANDLING STUDENT COMPLAINTS ABOUT FACULTY CONDUCT IN ACADEMIC SETTINGS

Effective February 1, 2007

- I. **Introduction.** The University and its Colleges have a variety of procedures for dealing with student-related issues, including grade appeals, academic integrity violations, student discipline, disclosure of student records, student elections, sexual harassment complaints, disability accommodations, and discrimination. One area not generally covered by other procedures concerns student complaints about faculty conduct in the classroom or other formal academic settings. The University respects the academic freedom of the faculty and will not interfere with it as it relates to the content or style of teaching activities. Indeed, academic freedom is and should be of paramount importance. At the same time the University recognizes its responsibility to provide students with a procedure for addressing complaints about faculty treatment of students that are not protected by academic freedom and are not covered by other procedures. Examples might include incompetent or inefficient service, neglect of duty, physical or mental incapacity and conduct unbecoming a member of the staff.
- II. **Determination of Appropriate Procedure.** If students have any question about the applicable procedure to follow for a particular complaint, they should consult with the chief student affairs officer. In

particular, the chief student affairs officer should advise a student if some other procedure is applicable to the type of complaint the student has.

III. **Informal Resolution.** Students are encouraged to attempt to resolve complaints informally with the faculty member or to seek the assistance of the department chairperson or campus ombudsman to facilitate informal resolution.

IV. **Formal Complaint.** If the student does not pursue informal resolution, or if informal resolution is unsuccessful, the student may file a written complaint with the department chairperson or, if the chairperson is the subject of the complaint, with the academic dean or a senior faculty member designated by the College president. (This person will be referred to below as the "Fact Finder.")

- a) The complaint shall be filed within 30 calendar days of the alleged conduct unless there is good cause shown for delay, including but not limited to delay caused by an attempt at informal resolution. The complaint shall be as specific as possible in describing the conduct complained of.
- b) The Fact Finder shall promptly send a copy to the faculty member about whom the complaint is made, along with a letter stating that the filing of the complaint does not imply that any wrongdoing has occurred and that a faculty member must not retaliate in any way against a student for having made a complaint. If either the student or the faculty member has reason to believe that the department chairperson may be biased or otherwise unable to deal with the complaint in a fair and objective manner, he or she may submit to the academic dean or the senior faculty member designated by the College president a written request stating the reasons for that belief; if the request appears to have merit, that person may, in his or her sole discretion, replace the department chairperson as the Fact Finder.
- c) The Fact Finder shall meet with the complaining student and faculty member, either separately or together, to discuss the complaint and to try to

resolve it. The Fact Finder may seek the assistance of the campus ombudsman or other appropriate person to facilitate informal resolution.

- d) If resolution is not possible, and the Fact Finder concludes that the facts alleged by the student, taken as true and viewed in the light most favorable to the student, establish that the conduct complained of is clearly protected by academic freedom, he or she shall issue a written report dismissing the complaint and setting forth the reasons for dismissal and send a copy to the complaining student, the faculty member, the chief academic officer and the chief student affairs officer. Otherwise, the Fact Finder shall conduct an investigation. The Fact Finder shall separately interview the complaining student, the faculty member and other persons with relevant knowledge and information and shall also consult with the chief student affairs officer and, if appropriate, the College ombudsman. The Fact Finder shall not reveal the identity of the complaining student and the faculty member to others except to the extent necessary to conduct the investigation. If the Fact Finder believes it would be helpful, he or she may meet again with the student and faculty member after completing the investigation in an effort to resolve the matter. The complaining student and the faculty member shall have the right to have a representative (including a union representative, student government representative or attorney) present during the initial meeting, the interview and any post-investigation meeting.
- e) At the end of the investigation, the Fact Finder shall issue a written report setting forth his or her findings and recommendations, with particular focus on whether the conduct in question is protected by academic freedom, and send a copy to the complaining student, the faculty member, the chief academic officer and the chief student affairs officer. In ordinary cases, it is expected that the investigation and written report should be completed within 30 calendar days of the date the complaint was filed.

V. **Appeals Procedure.** If either the student or the faculty member is not satisfied with the report of the Fact Finder, the student or faculty member may file a written appeal to the chief academic officer within 10 calendar days of receiving the report. The chief academic officer shall convene and serve as the chairperson of an Appeals Committee, which shall also include the chief student affairs officer, two faculty members elected annually by the faculty council or senate and one student elected annually by the student senate. The Appeals Committee shall review the findings and recommendations of the report, with particular focus on whether the conduct in question is protected by academic freedom. The Appeals Committee shall not conduct a new factual investigation or overturn any factual findings contained in the report unless they are clearly erroneous. If the Appeals Committee decides to reverse the Fact Finder in a case where there has not been an investigation because the Fact Finder erroneously found that the alleged conduct was protected by academic freedom, it may remand to the Fact Finder for further proceedings. The committee shall issue a written decision within 20 calendar days of receiving the appeal. A copy of the decision shall be sent to the student, the faculty member, the department chairperson and the president.

VI. **Subsequent Action.** Following the completion of these procedures, the appropriate college official shall decide the appropriate action, if any, to take. For example, the department chairperson may decide to place a report in the faculty member's personnel file or the president may bring disciplinary charges against the faculty member. Disciplinary charges may also be brought in extremely serious cases even though the College has not completed the entire investigative process described above; in that case, the bringing of disciplinary charges shall automatically suspend that process. Any action taken by a college must comply with the bylaws of the University and the collective bargaining agreement between the University and the Professional Staff Congress.

VII. **Campus Implementation.** Each campus shall implement these procedures and shall distribute them widely to administrators, faculty members and students and post them on the College website.

VIII. **Board Review.** During the spring 2009 semester, the Chancellery conducted a review of the experience of the colleges with these procedures, including consultation with administrators, faculty and students, and reported the results of that review to the Board of Trustees, along with any recommended changes.

Campus Policy on Grade Appeals

Pursuant to the following procedure students have a right to complain concerning any incident, person or policy which they feel impairs their educational pursuits at New York City College of Technology:

To appeal a final grade students should follow the procedure given in APPEALING A FINAL GRADE [Click here](#). Concerns of an academic nature other than a grade appeal (e.g., complaints against faculty) should first be brought to the attention of the instructor and then, if necessary, the department chair, the school dean, the dean of instruction and the provost, in that order.

Complaints of a nonacademic nature are recorded and processed for disposition in the Office of the Vice President for Enrollment and Student Services.

STUDENT DISCIPLINARY

ACADEMIC INTEGRITY

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity.

CUNY Policy on Academic Integrity

Academic dishonesty is prohibited in The City University of New York. Penalties for academic dishonesty include academic sanctions, such as failing or otherwise reduced grades, and/or disciplinary sanctions, including suspension, or expulsion.

Definitions and Examples of Academic Dishonesty

Cheating is the unauthorized use or attempted use of material, information, notes, study aids, devices or communication during an academic exercise.

The following are some examples of cheating, but by no means is it an exhaustive list:

- Copying from another student during an examination or allowing another to copy your work.
- Unauthorized collaboration on a take-home assignment or examination.
- Using notes during a closed-book examination.
- Taking an examination for another student, or asking or allowing another student to take an examination for you.
- Changing a graded exam and returning it for more credit.
- Submitting substantial portions of the same paper to more than one course without consulting each instructor.
- Preparing answers or writing notes in an exam booklet before an examination.
- Allowing others to research and write assigned papers or do assigned projects, including use of commercial term paper services.
- Giving assistance to acts of academic misconduct/dishonesty.
- Fabricating data (in whole or in part).
- Falsifying data (in whole or in part).
- Submitting someone else's work as your own.
- Unauthorized use during an examination of electronic devices such as cell phones, text messaging devices, palm pilots, computers or other technologies to retrieve or send information.

Plagiarism is the act of presenting another person's ideas, research or writings as your own.

The following are some examples of plagiarism, but by no means is it an exhaustive list:

- Copying another person's actual words without the use of quotation marks and footnotes attributing the words to their source.
- Presenting another person's ideas or theories in your own words without acknowledging the source.
- Using information that is not common knowledge without acknowledging the source.
- Failing to acknowledge collaborators on homework and laboratory assignments.

Internet Plagiarism includes submitting downloaded term papers or parts of term papers, paraphrasing or copying information from the internet without citing the source, and "cutting and pasting" from various sources without proper attribution.

Obtaining Unfair Advantage is any activity that intentionally or unintentionally gives a student an unfair advantage in his/her academic work over another student, or an action taken by a student through which a student attempts to gain an unfair advantage in his or her academic work over another student

The following are some examples of obtaining an unfair advantage, but by no means is it an exhaustive list:

- Stealing, reproducing, circulating or otherwise gaining advance access to examination materials.
- Depriving other students of access to library materials by stealing, destroying, defacing, or concealing them.
- Retaining, using or circulating examination materials that clearly indicate they should be returned at the end of the exam.
- Intentionally obstructing or interfering with another student's work.

Falsification of Records and Official Documents

The following are some examples of falsification, but by no means is it an exhaustive list:

- Forging signatures of authorization.
- Falsifying information on an official academic record.
- Falsifying information on an official document such as a grade report, letter of permission, drop/add form, ID card or other college document.

Methods for Promoting Academic Integrity at New York City College of Technology

NYCCT institutes the following practices in order to promote academic integrity at the College.

- Discussions of academic integrity issues are a part of orientation sessions held for new full-time and part-time faculty.
- Academic integrity workshops are held throughout the academic year in an effort to support the professional development of faculty.
- Discussions of academic integrity issues are a part of orientation sessions held for new full-time and part-time students.
- The CUNY Academic Integrity Policy is clearly published and distributed to students via the following methods: the NYCCT web site, the Instructional Staff Handbook, the Student Handbook, and via the College email system.

Sanctions for Academic Integrity Violations

In accordance with the CUNY Policy on Academic Integrity, NYCCT empowers its Academic Integrity Committee and Academic Integrity Officer to process violations of the CUNY Academic Integrity Policy.

Instructors must report all instances of academic dishonesty to the Academic Integrity Officer. The following are the various steps that instructors must follow when they suspect an act of academic dishonesty:

The instructor shall review with the student the facts and circumstances of the suspected violation whenever possible. Sanctions for violations of the Academic Integrity Policy may be an academic sanction (reduced grade), a disciplinary sanction (e.g., suspension or expulsion), or both.

- A) In cases where only an academic sanction is sought, the instructor shall inform the student of the exact sanction being sought. The instructor shall simultaneously complete and submit to the College's Academic Integrity Officer a Faculty Action Report (FAR) Form. The instructor should also inform his/her Chairperson of the suspected violation. The Academic Integrity Officer will place

a copy of the FAR form in the student's confidential file and will notify the student within seven (7) business days that he/she has been charged with a violation of the Academic Integrity Policy and that he/she has the right to appeal the charge to the Academic Integrity Officer, in writing, within thirty (30) business days.

- B) In cases where the student does not contest the charge, the instructor's academic sanction shall stand.
- C) In cases where the student does contest the charge, the Academic Integrity Officer shall instruct the Registrar to change the student's course grade to PEN (Pending Grade) and shall notify the student, the instructor, the instructor's Chairperson, and the Vice President for Student Affairs of a pending deliberation in the case. The Academic Integrity Committee shall convene to review the charge and all pertaining evidence therein, and will render a decision regarding the student's appeal.
- D) If the student's appeal is upheld, the Academic Integrity Officer and the instructor shall instruct the Registrar to change the student's grade to reflect the elimination of the instructor's penalty.
- E) If the student's appeal is denied, the instructor's sanction shall remain in effect, and no further appeal shall be available to the student.
- F) In cases where the student does not contest the charge but does contest the academic sanction, the student shall appeal using the college's grade appeal process.
- G) In cases where an academic and a disciplinary sanction is sought, or if only a disciplinary sanction is sought, the instructor shall record a PEN grade, and the Academic Integrity Officer shall refer the instructor's completed (Faculty Action Report) FAR Form to the Vice President for Student Affairs and shall notify the student that such action was taken. The Vice President for Student Affairs shall notify the student of the charges, which will include the hearing date before the Faculty-Student Disciplinary Committee (FSDC). Refer to the Student Rights and Responsibilities

section of the College Catalog for additional information.

- H) If the FSDC finds that the student did not violate the Academic Integrity Policy, the Vice President for Student Affairs, in consultation with the Academic Integrity Officer and the instructor, shall instruct the Registrar to change the student's grade to reflect the absence of any penalty. The Academic Integrity Officer shall remove and destroy all material relating to that incident from the student's confidential file.
- I) If the FSDC finds that the student did violate the Academic Integrity Policy, the Academic Integrity Officer shall instruct the Registrar to change the student's grade to reflect the academic penalty imposed by the instructor (if any). The Vice President for Student Affairs shall implement the disciplinary sanction against the student. The Academic Integrity Officer shall keep all materials of the case in the student's confidential file permanently.

NOTE: A student may not circumvent the sanctions process by withdrawing from a class. In the instance where an instructor seeks an academic sanction, or the Vice President for Student Affairs and Academic Integrity Officer seek both an academic and disciplinary sanction, a student's withdrawal from that course does not serve as a shield against a violation of academic integrity. In this case the sanctions process shall be implemented accordingly.

¹ *If a student is appealing a final grade, then the 30 business day period for filing an appeal of a final grade submitted for a course taken during the spring semester or summer session begins on the first day of the fall semester following the one in which the grade was submitted. Students filing an appeal for a final grade submitted for a course taken during the fall semester must do so within 30 days of the spring semester following the one in which the grade was submitted. Students wishing to appeal a grade submitted for an assignment prescribed as a semester's final project must adhere to the same deadlines.*

RULES AND REGULATIONS FOR THE MAINTENANCE AND REGULATIONS OF PUBLIC ORDER PURSUANT TO ARTICLE 129A OF THE EDUCATIONAL LAW

The tradition of the university as a sanctuary of academic freedom and center of informed discussion is an honored one, to be guarded vigilantly. The basic significance of sanctuary lies in the protection of intellectual freedom: the rights of professors to teach, of scholars to engage in the advancement of knowledge, of students to learn and to express their views, free from external pressures or interference. These freedoms can flourish only in an atmosphere of mutual respect, civility and trust among teachers and students, only when members of the university community are willing to accept self-restraint and reciprocity as the conditions upon which they share in its intellectual autonomy.

Academic freedom and the sanctuary of the university campus extend to all who share these aims and responsibilities. They cannot be invoked by those who would subordinate intellectual freedom to political ends, or who violate the norms of conduct established to protect that freedom. Against such offenders the university has the right, and indeed the obligation, to defend itself. We accordingly announce the following rules and regulations to be in effect at each of our colleges which are to be administered in accordance with the requirements of due process as provided in the bylaws of the board of trustees.

With respect to enforcement of these rules and regulations we note that the bylaws of the board provide that:

"The president, with respect to his educational unit, shall:

- a. Have the affirmative responsibility of conserving and enhancing the education standards of the College and schools under his jurisdiction;
- b. Be the advisor and executive agent of the board and of his respective college committee and as such shall have the immediate supervision with full discretionary power in carrying into effect the bylaws, resolutions, and policies of the board, the lawful resolutions of the several faculties;

- c. Exercise general superintendence over the facilities, concerns, officers, employees and students of his/her college; in consultation with the chancellor, prepare and implement the College master plan, which shall be subject to the approval of the chancellor and the board."

I. Rules

1. No member of the academic community shall intentionally obstruct and/or forcibly prevent others from the exercise of their rights. Nor shall he/she interfere with the institution's educational processes or facilities, or the rights of those who wish to avail themselves of any of the institution's instructional, personal, administrative, recreational, and community services.
2. Individuals are liable for failure to comply with lawful directions issued by representatives of the university/college when they are acting in their official capacities. Members of the academic community are required to show their identification cards when requested to do so by an official of the College.
3. Unauthorized occupancy of university/college facilities or blocking access to or from such areas is prohibited. Permission from appropriate college authorities must be obtained for removal, relocation, and use of university/college equipment and/or supplies.
4. Theft from, or damage to university/college premises or property, or theft of or damage to property of any person on university/college premises is prohibited.
5. Each member of the academic community or an invited guest has the right to advocate his/her position without having to fear abuse, physical, verbal, or otherwise, from those who hold conflicting points of view. Members of the academic community and other persons on the College grounds shall not use language or take actions reasonably likely to provoke or encourage physical violence by demonstrators, those demonstrated against, or spectators.
6. Action may be taken against any and all persons who have no legitimate reason for their presence on any campus within the university/college, or whose presence on any such campus obstructs and/or forcibly prevents others from the exercise of their

rights or interferes with the institution's educational processes or facilities, or the rights of those who wish to avail themselves of any of the institution's instructional, personal, administrative, recreational, and community services.

7. Disorderly or indecent conduct on university/college-owned or controlled property is prohibited.
8. No individual shall have in his possession a rifle, shotgun, or firearm or knowingly have in his/her possession any other dangerous instruments or material that can be used to inflict bodily harm on an individual or damage upon a building or the grounds of the university/college without the written authorization of such educational institution. Nor shall any individual have in his/her possession any other instrument or material which can be used for and is intended to inflict bodily harm on any individual or damage upon a building or the grounds of the university/college.
9. Any action or situation that recklessly or intentionally endangers mental or physical health or involves the forced consumption of liquor or drugs for the purpose of initiation into or affiliation with any organization is prohibited.
10. The unlawful manufacture, distribution, dispensation, possession, or use of illegal drugs or other controlled substances by university students or employees on university/college premises, or as part of any university/college activities is prohibited. Employees of the university must also notify the College's personnel director of any criminal drug statute conviction for a violation occurring in the workplace not later than five (5) days after such conviction.
11. The unlawful possession, use, or distribution of alcohol by students or employees on university/college premises or as part of any university/college activities is prohibited.

II. Penalties

Any student engaging in any manner in conduct prohibited under substantive Rules 1-11 shall be subject to the following range of sanctions as hereafter defined in the attached Appendix: admonition, warning, censure, disciplinary probation, restitution,

suspension, expulsion, ejection, and/or arrest by the civil authorities.

Any tenured or non-tenured faculty member, or other members of the instructional staff, or member of the classified staff engaging in any manner in conduct prohibited under substantive Rules 1-11 shall be subject to the following range of penalties: warning, censure, restitution, fine not exceeding those permitted by law or by the bylaws of The City University of New York, or suspension with/without pay pending a hearing before an appropriate college authority, dismissal after a hearing, ejection and/or arrest by the civil authorities, and, for engaging in any manner of conduct prohibited under substantive rule 10, may, in the alternative, be required to participate satisfactorily in an appropriately licensed drug treatment or rehabilitation program. A tenured or non-tenured faculty member, or other member of the instructional staff, or member of the classified staff charged with engaging in any manner in conduct prohibited under substantive rules 1-11 shall be entitled to be treated in accordance with applicable provisions of the Education Law, or the Civil Service Law, or the applicable collective bargaining agreement, or the bylaws or written policies of The City University of New York.

Any visitor, licensee, or invitee engaging in any manner in conduct prohibited under substantive Rules 1-11 shall be subject to ejection, and/or arrest by the civil authorities.

Any organization which authorized the conduct prohibited under substantive rules 1-11 shall have its permission to operate on campus rescinded.

Penalties 1-4 shall be in addition to any other penalty provided by law or The City University trustees.

Sanctions Defined

Admonition: an oral statement to the offender that he/she has violated university rules.

Warning: notice to the offender orally or in writing, that continuation or repetition of the wrongful conduct within a period of time stated in the warning, may be the cause for more severe disciplinary action.

Censure: written reprimand for violation of specified regulations, including the possibility of more severe disciplinary sanction in the event of conviction for the violation of any university regulation within a period stated in the letter of reprimand.

Disciplinary Probation: exclusion from participation in privileges or extracurricular university activities as set forth in the notice of disciplinary probation for a specified period of time.

Restitution: reimbursement for damage to or misappropriation of property. Reimbursement may take the form of appropriate service to repair or otherwise compensate for damages.

Suspension: exclusion from classes and other privileges or activities as set forth in the notice of suspension for a definite period of time.

Expulsion: termination of student status for an indefinite period. The conditions of readmission, if any are permitted, shall be stated in the order of expulsion.

BYLAWS OF THE CITY UNIVERSITY OF NEW YORK ARTICLE XV - STUDENTS

SECTION 15.0. PREAMBLE.

Academic institutions exist for the transmission of knowledge, the pursuit of truth, the development of students, and the general well-being of society. Student participation, responsibility, academic freedom, and due process are essential to the operation of the academic enterprise. As members of the academic community, students should be encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth.

Freedom to learn and to explore major social, political, and economic issues are necessary adjuncts to student academic freedom, as is freedom from discrimination, as set forth in the university's non-discrimination policy.

Freedom to learn and freedom to teach are inseparable facets of academic freedom. The concomitant of this freedom is responsibility. If members of the academic community are to develop positively in their freedom; if these rights are to be secure, then students should exercise their freedom with responsibility.

SECTION 15.1. CONDUCT STANDARD DEFINED.

Each student enrolled or in attendance in any college, school or unit under the control of the board and every student organization, association, publication, club or chapter shall obey (1) the laws of the city, state and nation; (2) the bylaws and resolutions of the board, including the rules and regulations for the maintenance of public order pursuant to article 129-a of the education law ("Henderson rules"); and (3) the governance plan, policies, regulations, and orders of the college. Such laws, bylaws, resolutions, policies, rules, regulations and orders shall, of course, be limited by the right of students to the freedoms of speech, press, assembly and petition as construed by the courts.

SECTION 15.2. STUDENT ORGANIZATIONS.

- a. Any group of students may form an organization, association, club or chapter by filing with the duly elected student government organization of the college or school at which they are enrolled or in attendance and with an officer to be designated by the chief student affairs officer of the college or school at which they are enrolled or in attendance (1) the name and purposes of the organization, association, club or chapter, (2) the names and addresses of its president and secretary or other officers corresponding in function to president and secretary.

The board recognizes that students have rights to free expression and association. At the same time, the board strongly believes that respect for all members of the university's diverse community is an essential attribute of a great university.

- b. Extra-curricular activities at each college or school shall be regulated by the duly elected student government organization to insure the effective conduct of such college or school as an institution of higher learning and for the prevention of activities which are hereafter proscribed or which violate the standards of conduct of the character set forth in bylaw 15.1. Such powers shall include:
 1. The power to charter or otherwise authorize teams (excluding intercollegiate athletics), publications, organizations,

- associations, clubs or chapters, and, when appropriate in the exercise of such regulatory power, the power to refuse, suspend or revoke any charter or other authorization for cause after hearing on notice.
2. The power to delegate responsibility for the effective implementation of its regulatory functions hereunder to any officer or committee which it may appoint.
- c. 1. Any person or organization affiliated with the college may file a complaint with the chief student affairs officer if there is reason to believe that a student organization has violated any of the standards of conduct set forth in section 15.1 above. The chief student affairs officer shall promptly notify the affected organization, investigate any complaint and report the results of that investigation along with a recommendation for appropriate action to the complainant and the student government which shall take action as it deems appropriate, except that in the case of a complaint against the student government itself, the chief student affairs officer shall report the results of the investigation and the recommendation for appropriate action directly to the president.
2. The complainant or any student organization adversely affected pursuant to paragraph c (1) above may appeal to the president. The president may take such action as he or she deems appropriate, and such action shall be final.
- d. Each college shall establish a student elections review committee in consultation with the various student governments. The student elections review committee shall approve the election procedures and certify the results of elections for student governments, and student body referenda. Decisions of the student elections review committee may be appealed to the college president, whose decision shall be final. An appeal from the decision of the student elections review committee must be made in writing to the President within ten (10) calendar days of the decision. The President shall consult with the student elections review committee and render

a decision as expeditiously as possible which may affirm, reverse, or modify the decision of the student elections review committee.

- e. Student government elections shall be scheduled and conducted, and newly elected student governments shall take office, in accordance with policies of the board, and implementing regulations.

SECTION 15.3. THE UNIVERSITY STUDENT SENATE.

There shall be a university student senate responsible, subject to the board of trustees, for the formulation of university-wide student policy relating to the academic status, role, rights and freedoms of the student. The authority and duties of the university student senate shall not extend to areas of interest which fall exclusively within the domain of the student governments of the constituent units of the university. Consistent with the authority of the board of trustees in accordance with the education law and the bylaws of the board of trustees, the university student senate shall make its own bylaws providing for the election of its own officers, the establishment of its own rules and procedures, for its internal administration and for such other matters as is necessary for its existence. The university student senate shall have the full rights and responsibilities accorded student organizations as provided in these bylaws. The delegates and alternate delegates to the university student senate shall be elected by their respective constituencies, or by their student governments from the elected members of the respective student governments.

SECTION 15.4. STUDENT DISCIPLINARY PROCEDURES.

Complaint Procedures:

- a. A University student, employee, visitor, organization or department who/ which believes she/he/it is the victim of a student's misconduct (hereinafter "complainant") may make a charge, accusation, or allegation against a student (hereinafter "respondent") which if proved, may subject the respondent to disciplinary action. Such charge, accusation, or allegation must be communicated to the chief student affairs

officer of the college the respondent attends.

- b. The chief student affairs officer of the college or her or his designee shall conduct a preliminary investigation in order to determine whether disciplinary charges should be preferred. The chief student affairs officer or her or his designee shall advise the respondent of the allegation against her or him, explain to the respondent and the complainant their rights, consult with other parties who may be involved or who have information regarding the incident, and review other relevant evidence. The preliminary investigation shall be concluded within thirty (30) calendar days of the filing of the complaint, unless: (i) said complaint involves two or more complainants or respondents; or (ii) said complaint involves a matter that is also under investigation by law enforcement authorities. In those cases, the preliminary investigation shall be completed within sixty (60) calendar days. Further, if the matter has been previously investigated pursuant to the Board of Trustees Policy Against Sex-Based Harassment and Sexual Violence, the chief student affairs officer shall dispense with a preliminary investigation and rely on the report completed by the Title IX Coordinator. Following the completion of the preliminary investigation, the chief student affairs officer or designee shall take one of the following actions:
- (i) Dismiss the matter if there is no basis for the allegation(s) or the allegation(s) does not warrant disciplinary action. The individuals involved shall be notified that the complaint has been dismissed; (ii) Refer the matter to mediation (except in cases involving allegations of sexual assault, stalking or other forms of sexual violence); or
- (iii) Prefer formal disciplinary charges.
- c. In the event that a respondent withdraws from the college after a charge, accusation or allegation against a respondent has been made, and the college prefers formal disciplinary charges, the respondent is required to

participate in the disciplinary hearing or otherwise to resolve the pending charges and shall be barred from attending any other unit of the university until a decision on the charges is made or the charges are otherwise resolved. If the respondent fails to appear the college may proceed with the disciplinary hearing in absentia, and any decision and sanction shall be binding.

Mediation Conference:

- d. The college may offer the respondent and the complainant the opportunity to participate in a mediation conference prior to the time the disciplinary hearing takes place in an effort to resolve the matter by mutual agreement (except in cases involving sexual assault, stalking and other forms of sexual violence). The conference shall be conducted by a qualified staff or faculty member designated by the chief student affairs officer. The following procedures shall be in effect at this conference:
1. An effort shall be made to resolve the matter by mutual agreement.
 2. If an agreement is reached, the faculty or staff member conducting the conference shall report her/his recommendation to the chief student affairs officer for approval and, if approved, the complainant and the respondent shall be notified, and a written memorandum shall be created memorializing the resolution and any consequences for non-compliance.
 3. If no agreement is reached within a reasonable time, or if the respondent fails to appear, the faculty or staff member conducting the conference shall refer the matter back to the chief student affairs officer who may prefer disciplinary charges.
 4. The faculty or staff member conducting the mediation conference is precluded from testifying at a college hearing regarding information received during the mediation conference, or presenting the case on behalf of the college.

Notice of Hearing and Charges, and Pre-Hearing Document Inspection:

- e. Notice of the charge(s) and of the time and place of the hearing shall be personally delivered to the respondent, or sent by certified or overnight mail and email to the respondent's CUNY-assigned email address. Notice shall also be sent in a similar manner to the complainant to the extent the charges relate to her/him/it. The chief student affairs officer is also encouraged to send the notice of charges to any other email address that he or she may have for the respondent and the complainant. The hearing shall be scheduled within a reasonable time following the filing of the charges or the mediation conference. Notice of at least seven (7) calendar days shall be given to the respondent in advance of the hearing unless the respondent consents to an earlier hearing. The respondent is permitted one (1) adjournment as of right. Additional requests for an adjournment must be made at least five (5) calendar days prior to the hearing date, and shall be granted or denied at the discretion of the chairperson of the faculty-student disciplinary committee. If the respondent fails to respond to the notice, appear on the adjourned date, or request an extension, the college may proceed in absentia, and any decision and sanction shall be binding.
- f. The notice shall contain the following:
1. A complete and itemized statement of the charge(s) being brought against the respondent including the rule, bylaw or regulation she/he is charged with violating, and the possible penalties for such violation.
 2. A statement that the respondent and the complainant have the right to attend and participate fully in the hearing including the right:
 - (i) to present their side of the story;
 - (ii) to present witnesses and evidence on their behalf;
 - (iii) to cross-examine witnesses presenting evidence;
 - (iv) to remain silent without assumption of guilt; and

- (v) to be represented by an advisor or legal counsel at their expense; if the respondent or the complainant request it, the college shall assist in finding a legal counsel or advisor.
3. A warning that anything the respondent says may be used against her/him at a non-college hearing.
 4. At least five (5) calendar days prior to the commencement of a student disciplinary hearing, the college shall provide the respondent and the complainant and/or their designated representative, with similar and timely access to review any documents or other tangible evidence that the college intends to use at the disciplinary hearing, consistent with the restrictions imposed by Family Education Rights and Privacy Act ("FERPA"). Should the college seek to introduce additional documents or other tangible evidence during, or some time prior to, the disciplinary hearing, the respondent and the complainant shall be afforded the opportunity to review the additional documents or tangible evidence. If during the hearing the respondent submits documentary evidence, the chairperson may, at the request of either the college or the complainant, direct the respondent to produce such other documents as may be necessary in the interest of fairness.

Emergency Suspension:

- g. The president or her/his designee may in emergency or extraordinary circumstances, temporarily suspend a student pending an early hearing as provided in this bylaw section 15.4. to take place within not more than twelve (12) calendar days, unless the student requests an adjournment. Such suspension shall be for conduct which impedes, obstructs, impairs or interferes with the orderly and continuous administration and operation of any college, school, or unit of the university in the use of its facilities or in the achievement of its purposes as an educational institution. Prior to the commencement of a temporary suspension of a student, the college shall give the student oral notice (which shall be confirmed via email to the address appearing on the records of the college)

or written notice of the charges against her/him and, if she/he denies them, the college shall forthwith give the student an informal oral explanation of the evidence supporting the charges and the student may present informally her/his explanation or theory of the matter. When a student's presence poses a continuing danger to person or property or an ongoing threat of disrupting the academic process, notice and opportunity for denial and explanation may follow suspension, but shall be given as soon as feasible thereafter. The complainant shall be notified in the event that an emergency suspension is imposed against a student, and/or when the suspension is subsequently lifted to the extent that the suspension involves the complainant in the same manner notice is given to the student.

Faculty-Student Disciplinary Committee Structure:

- h. Each faculty-student disciplinary committee shall consist of two (2) faculty members or one (1) faculty member and one (1) member of the Higher Education Officer series (HEO), and two (2) student members and a chairperson, who shall be a faculty member. A quorum shall consist of the chairperson and any two (2) members, one of whom must be a student. Hearings shall be scheduled promptly (including during the summers) at a convenient time and efforts shall be made to insure full student and faculty representation.
- i. The president shall select in consultation with the head of the appropriate campus governance body or where the president is the head of the governance body, its executive committee, three (3) members of the faculty of that college to receive training and to serve in rotation as chairperson of the disciplinary committee. The following schools shall be required to select two (2) chairpersons: CUNY School of Law, Guttman Community College, CUNY School of Professional Studies, and the CUNY School of Journalism. If none of the chairpersons appointed from the campus can serve, the president, at her/his discretion, may request that a chairperson be selected by lottery from the entire group of chairpersons appointed by other colleges. The chairperson shall preside at all meetings of the faculty-student disciplinary committee and decide and make all rulings for the committee. She/he shall not be a voting member of the committee but shall vote in the event of a tie.
- j. The faculty members shall be selected by lot from a panel of six (6) elected biennially by the appropriate faculty body from among the persons having faculty rank or faculty status. CUNY School of Law, Guttman Community College, CUNY School of Professional Studies, and the CUNY School of Journalism shall be required to select four (4) faculty members. The HEO members shall be selected by lot from a panel of six (6) HEO appointed biennially by the president. CUNY School of Law, Guttman Community College, CUNY School of Professional Studies, and the CUNY School of Journalism shall be required to select four (4) HEO's. The student members shall be selected by lot from a panel of six (6) elected annually in an election in which all students registered at the college shall be eligible to vote. CUNY School of Law, Guttman Community College, CUNY School of Professional Studies, and the CUNY School of Journalism shall be required to select four (4) students. In the event that the student or faculty panel or both are not elected, or if more panel members are needed, the president shall have the duty to select the panel or panels which have not been elected. No individuals on the panel shall serve on the panel for more than four (4) consecutive years. Notwithstanding the above, in cases of sexual assault, stalking and other forms of sexual violence, the president shall designate one (1) chairperson, two (2) faculty/HEO members, and two (2) students, who shall be specially trained, and who shall constitute the faculty-student disciplinary committee in all such cases.
- k. In the event that the chairperson cannot continue, the president shall appoint another chairperson. In the event that a seat becomes vacant and it is necessary to fill the seat to continue the hearing, the seat shall be filled from the respective faculty, HEO, or student panel by lottery.

- l. Each academic year, the chief student affairs officer, and her or his designee, shall appoint/identify one or more college employees to serve as presenters for the hearings. This list shall be forwarded to the Office of the Vice Chancellor for Student Affairs, and the Office of the General Counsel and Sr. Vice Chancellor for Legal Affairs prior to the first day of the academic year.
- m. Persons who are to be participants in the hearings as witnesses or have been involved in preferring the charges or who may participate in the appeals procedures or any other person having a direct interest in the outcome of the hearing shall be disqualified from serving on the committee.

Faculty-Student Disciplinary Committee Procedures:

- n. The following procedures shall apply at the hearing before the faculty-student disciplinary committee:
 - 1. The chairperson shall preside at the hearing. The chairperson shall inform the respondent of the charges, the hearing procedures and her or his rights.
 - 2. All faculty student disciplinary committee hearings are closed hearings, but the respondent has the right to request an open public hearing. However, the chairperson has the right to deny the request and hold a closed hearing when an open public hearing would adversely affect and be disruptive to the committee's normal operations, or when the complainant in a case involving allegations of sexual assault, stalking, or other forms of sexual violence requests a closed hearing. In the event of an open hearing, the respondent must sign a written waiver acknowledging that those present will hear the evidence introduced at the hearing.
 - 3. After informing the respondent of the charges, the hearing procedures, and her or his rights, the chairperson shall ask the respondent to respond. If the respondent admits the conduct charged, the respondent shall be given an opportunity to explain her/his actions before the committee and the college shall be given an opportunity to respond and present

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- evidence regarding the appropriate penalty. If the respondent denies the conduct charged, the college shall present its case. At the conclusion of the college's case, the respondent may move to dismiss the charges. If the motion is denied by the committee, the respondent shall be given an opportunity to present her or his defense.
4. Prior to accepting testimony at the hearing, the chairperson shall rule on any motions questioning the impartiality of any committee member or the adequacy of the notice of the charge(s). Subsequent thereto, the chairperson may rule on the admissibility of the evidence and may exclude irrelevant, unreliable or unduly repetitive evidence. In addition, if either party wishes to question the impartiality of a committee member on the basis of evidence which was not previously available at the inception of the hearing, the chairperson may rule on such a motion. The chairperson shall exclude from the hearing room all persons who are to appear as witnesses, except the respondent and the complainant.
5. The college shall make a record of each fact-finding hearing by some means such as a stenographic transcript, an audio recording or the equivalent. The college must assign a staff member for each hearing, with the sole responsibility of ensuring that the hearing is recorded in its entirety. No other recording of the proceedings may be permitted. A respondent who has been found to have committed the conduct charged after a hearing is entitled upon request to a copy of such a record without cost upon the condition that it is not to be disseminated except to the respondent's representative or attorney. In the event of an appeal, both the respondent and the complainant are entitled upon request to a copy of such a record without cost, upon the condition that it is not to be disseminated except to their representatives or attorneys.
6. The college bears the burden of proving the charge(s) by a preponderance of the evidence.
7. The role of the faculty-student disciplinary committee is to listen to the testimony, ask questions of the witnesses, review the testimony and evidence presented at the hearing and the papers filed by the parties and render a determination. In the event the respondent is found to have committed the conduct charged, the committee shall then determine the penalty to be imposed.
8. The college, the respondent and the complainant are permitted to have lawyers or other representatives act on their behalf during the pendency of a disciplinary action, which shall include the calling and examining of witnesses, and presenting other evidence. Any party intending to appear with an attorney shall give the other party 5 (five) calendar days' notice of such representation.
9. The chairperson of the faculty-student disciplinary committee retains discretion to limit the number of witnesses and the time of testimony for the presentations by any party and/or their representative.
10. In the event that the respondent is charged with a sexual assault, stalking or other forms of sexual violence, neither the respondent nor the complainant shall be permitted to cross-examine the other directly. Rather, if they wish to, the respondent and the complainant may cross-examine each other only through a representative. If either or both of them do not have a representative, the college shall work with them to find a representative to conduct such cross-examination. In the alternative, either party may provide written questions to the chairperson to be posed to the witness.
11. At the end of the presentations, the respondent and the complainant may introduce individual character references. The college may introduce a copy of the respondent's previous disciplinary record, including records from any CUNY institution the respondent has attended, where applicable, provided the respondent was shown a copy of the record prior to the commencement of the hearing. The previous disciplinary record shall be submitted to the committee in a sealed envelope, bearing the respondent's signature across the seal, and shall only be opened if the respondent has been found to have committed the conduct charged. The previous disciplinary records, as well as documents and character evidence introduced by the respondent, the complainant, and the college shall be opened and used by the committee for dispositional purposes, i.e., to determine an appropriate penalty if the charges are sustained.
12. The committee shall deliberate in closed session. The committee shall issue a written decision, which shall be based solely on the testimony and evidence presented at the hearing and the papers filed by the parties.
13. The respondent shall be sent a copy of the faculty-student disciplinary committee's decision within seven (7) calendar days of the conclusion of the hearing, by regular mail and e-mail to the address appearing on the records of the college. In cases involving two or more complainants or respondents, the respondent shall be sent a copy of faculty-student disciplinary committee's decision within fourteen (14) calendar days of the conclusion of the hearing. The chief student affairs officer is also encouraged to send the decision to any other e-mail address that he or she may have for the respondent. The decision shall be final subject to any appeal. In cases involving a crime of violence or a non-forcible sex offense, as set forth in FERPA, the complainant shall simultaneously receive notice of the outcome of the faculty-student disciplinary committee's decision as it relates to the offense(s) committed against the complainant, in the same manner as notice is given to the respondent.
14. When a disciplinary hearing results in a penalty of dismissal or suspension for one term or more, the decision is a university-wide penalty and the respondent shall be barred from admission to, or attendance at, any other unit of the university while the penalty is being served.
15. Disciplinary penalties shall be placed on a respondent's transcript unless a mediation agreement, the committee's decision, or the decision on any appeal under section 15.4(o) below, expressly

indicate otherwise. For all undergraduate students, a penalty other than suspension or expulsion shall be removed from the respondent's transcript upon the request of the respondent after at least four (4) years have elapsed since the penalty was completed, unless the respondent has been found to have committed a subsequent violation pursuant to this Article. The chief student affairs officer shall be responsible for having any penalty removed from a student's transcript as provided above.

Appeals.

- o. A respondent or a complainant may appeal a decision of the faculty-student disciplinary committee to the president on the following grounds: (i) procedural error, (ii) newly discovered evidence that was not reasonably available at the time of the hearing, or (iii) the disproportionate nature of the penalty. The president may remand for a new hearing or may modify the penalty either by decreasing it (on an appeal by the respondent) or increasing it (on an appeal by the complainant). If the president is a party to the dispute, her/his functions with respect to an appeal shall be discharged by an official of the university to be appointed by the chancellor or her or his designee. If the penalty after appeal to the president is one of dismissal or suspension for one term or more, a respondent or a complainant may appeal to the board committee on student affairs and special programs. The board may dispose of the appeal in the same manner as the president.
- p. An appeal under this section shall be made in writing within fifteen (15) calendar days after the delivery of the decision appealed from. This requirement may be waived in a particular case for good cause by the president or the board committee as the case may be. Within three (3) calendar days of the receipt of any appeal, either to the president or the board committee on student affairs and special programs, the appealing party shall be sent a written notice of the other party's appeal. In addition, the respondent and/or the complainant shall have the opportunity to

submit a written opposition to the other party's appeal within fifteen (15) calendar days of the delivery of the notice of receipt of such appeal.

- q. The president shall decide and issue a decision within fifteen (15) calendar days of receiving the appeal or within fifteen (15) calendar days of receiving papers in opposition to the appeal, whichever is longer. The board committee shall decide and issue a decision within five (5) calendar days of the meeting at which it hears the appeal.

SECTION 15.5. ACTION BY THE BOARD OF TRUSTEES.

Notwithstanding the foregoing provisions of this article, the board of trustees reserves full power to suspend or take other appropriate action against a student or a student organization for conduct which impedes, obstructs, or interferes with the orderly and continuous administration and operation of any college, school, or units of the university in the use of its facilities or in the achievement of its purposes as an educational institution in accordance with procedures established by the board of trustees.

SECTION 15.6. COLLEGE GOVERNANCE PLANS.

The provisions in a duly adopted college governance plan shall not be inconsistent with the provisions contained in this article.

THE UNIVERSITY POLICY ON THE SUBMISSION OF FRAUDULENT DOCUMENTS IN SUPPORT OF AN APPLICATION FOR ADMISSION

The submission of documents in support of applications for admission such as transcripts, diplomas, test scores, references, or the applications themselves that are forged, fraudulent, altered from the original, obtained under false pretenses, or otherwise deceptive (collectively referred to as fraudulent documents) is prohibited by The City University of New York (CUNY) and may be punishable by: a bar on applying for admission, suspension and expulsion. The term "application for admission" includes transfer applications.

Procedures for Imposition of Sanctions

I. Pre-Enrollment

Whenever an applicant for admission to any college of CUNY submits, as part of an admission application, a document that is found to be fraudulent before an admission decision is made or before the applicant has enrolled, the applicant shall be barred from enrolling in any college of CUNY the year of the application and for a period of five years after the year of the application that contained the fraudulent material. If done a second time, there shall be a lifetime ban on admission to any college of CUNY. In the event of the submission of fraudulent documents, CUNY will notify the applicant in writing of this prohibited act and the penalty, and advise the applicant of the opportunity to appeal the decision in writing to the Vice Chancellor for Student Development and Enrollment Management. The applicant may then submit a written statement and evidence demonstrating that the document is not fraudulent or advancing some other defense. The Vice Chancellor may reduce or withdraw the penalty, if he or she finds the document to be authentic, that the submission of the document was not the fault of the applicant, or otherwise deems it appropriate.

II. Post-Enrollment

If, after a student has completed registration or begun classes in a CUNY college, it is found that the student had submitted a fraudulent document in support of an application for admission, the student shall be suspended from CUNY for five years. A second offense shall result in expulsion. The suspension or expulsion shall apply to all colleges of CUNY. The accused student shall be notified of such suspension or expulsion in writing and shall be entitled to appeal within 30 days of receiving notification and request a hearing pursuant to Article XV of the CUNY Bylaws, at which the College faculty-student disciplinary committee shall determine the facts, based upon which the disciplinary committee may, if persuaded that the document is authentic or that another defense is demonstrated, withdraw or a reduce the penalty. The penalty shall not take effect until after

the period to appeal has expired or upon the completion of the hearing. An adverse decision of the disciplinary committee can be appealed by the accused student to the College president and a board committee pursuant to Article XV of the CUNY Bylaws.

III. Post-Graduation

If, after a student has graduated, it is found that the graduate submitted a fraudulent document in support of an application for admission, then he or she shall be notified in writing. The accused graduate shall be entitled to a hearing pursuant to Article XV of the CUNY Bylaws, at which the College faculty-student disciplinary committee shall determine the facts, based upon which the disciplinary committee may make a decision to impose a penalty of suspension from CUNY for five years, and may also recommend the revocation of the degree or certificate that had been awarded to the student. A second offense shall result in expulsion. The suspension or expulsion shall apply to all colleges of CUNY. An adverse decision of the disciplinary committee imposing a suspension or expulsion can be appealed to the College president and a Board committee pursuant to Article XV of the Bylaws.

THE CITY UNIVERSITY OF NEW YORK CAMPUS AND WORKPLACE VIOLENCE POLICY

POLICY STATEMENT¹

The City University of New York (the "University" or "CUNY") is committed to the prevention of workplace violence and will respond promptly to any threats and/or acts of violence. For purposes of this Policy, Workplace Violence is defined as any physical assault or acts of aggressive behavior occurring where an employee performs any work related duty in the course of his or her employment, including but not limited to:

- (i) An attempt or threat, whether verbal or physical, to inflict physical injury upon an employee;
- (ii) Any intentional display of force which would give an employee reason to fear or expect bodily harm;
- (iii) Intentional and wrongful physical contact with an employee without his or her consent that entails some injury;

- (iv) Stalking an employee in a manner which may cause the employee to fear for his or her physical safety and health when such stalking has arisen through and in the course of employment.

Workplace Violence presents a serious occupational safety hazard to CUNY and its employees. The University will respond promptly to threats and/or acts of violence. All employees are responsible for helping to create an environment of mutual respect and for assisting in maintaining a safe and secure work environment and will participate in the annual Workplace Violence Prevention Training Program. . Individuals who violate this Policy may be removed from University property and are subject to disciplinary and/or personnel action up to and including termination, consistent with University policies, rules and collective bargaining agreements, and/or referral to law enforcement authorities for criminal prosecution

Incidents involving Workplace Violence will be given the serious attention they deserve.² Employees are responsible for reporting any incidents of Workplace Violence of which they become aware. The procedure for reporting incidents of suspected or alleged Workplace Violence can be found in the campus specific Workplace Violence Programs at Paragraph 7. The procedure for reporting complaints of a potential violation of the CUNY Workplace Violence Policy and Programs can be found in the campus specific Workplace Violence Programs at Paragraph 9.

The University, at the request of an employee or student, or at its own discretion, may prohibit members of the public, including family members, from seeing an employee or student on University property unless necessary to transact University-related business. This policy particularly applies when an employee or student anticipates that an act of violence may result from an encounter with said individual(s).³

Employee participation in the implementation of this Policy will be provided through their authorized employee representatives, who will be invited to participate in:

- (1) scheduled physical risk assessment site evaluation(s) to determine the presence of

risk factors which may place employees at risk of workplace violence; (2) the development and annual review of a Workplace Violence Prevention Program promulgated by each to report concerns about workplace violence. College for the implementation of the Policy; (3) the annual review of the Campus Workplace Violence Incidents Report prepared annually by each College; and (4) as appropriate, following a serious incident of Workplace Violence.

1 This document supersedes and replaces The City University of New York Campus and Workplace Violence Policy approved by The City University of New York Board of Trustees on February 28, 2011,

2 Complaints of sexual harassment are covered under the University's Policy Against Sexual Harassment.

3 Students are not directly covered by this Policy, but they should contact the Department of Public Safety

Approved by the Board of Trustees,
September 26, 2011

THE CITY UNIVERSITY OF NEW YORK MEDICAL WITHDRAWAL AND RE-ENTRY POLICY AND PROCEDURES GOVERNING STUDENT BEHAVIOR THAT PRESENTS A DIRECT THREAT OF HARM TO SELF OR OTHERS OR SUBSTANTIALLY DISRUPTS THE LEARNING OR WORKING ENVIRONMENT OF OTHERS

Introduction

The City University of New York ("CUNY") is committed to the academic success and personal growth of its students. As part of that commitment, CUNY and its constituent campuses are responsible for providing a safe learning and working environment for students, faculty, staff and other members of the University community. Some students may, because of a medical condition, engage in behavior that presents a direct threat of harm to themselves or to others, or substantially disrupts the learning or working environment of others. In such situations, the safety and security of the campus community, including the individual student, is paramount. This policy does not replace or supersede reasonable and appropriate security and health and safety measures, such as calling 911 or taking other immediate action in case of imminent threat to life or limb.

In addition to taking action to protect the security and safety of the campus community, a college may address the student's conduct to determine if action under this policy or under

the student disciplinary process is appropriate. When a student's conduct that directly threatens or substantially disrupts the learning or working environment of others appears to relate to a medical condition, the campus may, at its option, address the student's conduct either in accordance with this policy, or through the student disciplinary process. If the student's conduct constitutes a threat solely to him or herself, it should be addressed under this policy rather than the disciplinary process.

Policy

- A. As an alternative to disciplinary action that may be taken under Article XV of CUNY's Bylaws, a college of CUNY may bring a proceeding to require a student to withdraw from the University, or, under some circumstances, the student's home college and/or from residence in a college residence hall under this withdrawal policy and procedures when the student's behavior evidences a direct threat of harm to others, or when the student's behavior substantially disrupts the learning or working environment of others. A direct threat means a significant risk of harm to health or safety.
- B. A student who threatens to commit or attempts to commit suicide, and who does not otherwise threaten direct harm to others or substantially disrupt the learning or working environment of others, shall not be subject to disciplinary action for that threat or attempt under Article XV of the CUNY's Bylaws. If a college determines that withdrawal of the student or retention of the student subject to specified conditions is appropriate because the student's behavior threatens direct harm to him or herself, the procedures outlined below shall apply instead of disciplinary procedures.
- C. A student who withdraws or is withdrawn from the University, a college or college residence hall pursuant to this policy may apply for re-entry to the University, a college and/or to a college residence hall. The application for re-entry shall be made to the student's home college's Chief Student Affairs Officer, who shall determine whether the student still presents a direct threat of harm to him or herself or others or still presents a significant risk to substantially disrupt the learning or working environment of others. If

the Chief Student Affairs Officer or designee determines, based on the assessment of a qualified, licensed mental health professional, that there is not a significant risk that the behavior that required withdrawal will be repeated, he or she shall approve the student's application for re-entry.

CAMPUS SECURITY AND PUBLIC SAFETY

It is the policy of The City University of New York and this College that:

Any action or situation that recklessly or intentionally endangers mental or physical health or involves the forced consumption of liquor or drugs for the purpose of initiation or affiliation with any organization is prohibited.

The unlawful manufacture, distribution, dispensation, possession, or use of illegal drugs or other controlled substances by University students or employees on University/College premises or as part of any University/College activities is prohibited. Employees of the University must also notify NYCCT's personnel director of any criminal drug statute conviction for a violation occurring in the workplace not later than five (5) days after such conviction.

The unlawful possession, use or distribution of alcohol by students or employees on University/College premises or as part of any University/College activities is prohibited.

No persons within the University community except peace officers, pursuant to authorization of the NYCCT president shall have in their possession a rifle, shotgun, firearm or any other dangerous instrument or material that can be used to inflict bodily harm on an individual or damage to a building or the grounds of a campus.

Regarding complaints of sexual harassment, it is the policy of The City University of New York and this College to prohibit sexual harassment of employees and students. It is a violation of policy for any member of the NYCCT community to take action against an individual for reporting sexual harassment.

This policy is related to and is in conformity with the equal employment opportunity policy of the University to recruit, employ, retain and promote employees without regard to sex, age, race, color, or

creed. Prompt investigation of allegations will be made on a confidential basis to ascertain the veracity of complaints, and appropriate corrective action will be taken.

Students, staff and faculty may report security problems to the Office of Public Safety or to public safety personnel on patrol or at stationary posts.

ACCESS TO CAMPUS CRIME STATISTICS

Campus crime statistics and the annual campus security form are available at the reference desk of the College library and may be accessed through the College website at <http://www.citytech.cuny.edu/public-safety/crime-statistics.aspx>, under The Jeanne Clery Disclosure Act. If you wish to be mailed copies of the campus crime statistics and the annual campus security report, you should contact the Director of Public Safety, at 718.260.5550 and copies will be mailed to you within 10 days. The U.S. Department of Education's website address for campus crime statistics is <http://ope.ed.gov/security/>. Type "CUNY New York City College of Technology" under institution name to view the most recent statistics.

SEXUAL MISCONDUCT POLICY

Title IX of the Education Amendments of 1972 and its implementing regulations prohibit discrimination on the basis of sex in any federally funded education program or activity. Sexual harassment, which includes acts of sexual violence, is a form of sex discrimination. New York City College of Technology is committed to providing an environment free from unlawful discrimination and harassment. The full policy is available online at http://www.citytech.cuny.edu/about-us/docs/policy_on_sexual_misconduct.pdf. For additional information on Title IX or to file a complaint, please contact the Title IX Coordinator, Patricia Cody, Esq., at pcody@citytech.cuny.edu, room Namm 325 or 718.260.4985.

STUDENT CONDUCT REGULATIONS

Students who are enrolled in NYCCT must conduct themselves in a manner that is in keeping with the functions of the College as an educational institution. Therefore,

violations of any of NYCCT's regulations are subject to disciplinary action. Infractions of the regulations include but are not limited to the following:

- Failure to wear student identification card, validated for the current semester, at all times when on campus.
- Failure to present a validated ID card when requested: a) at all NYCCT activities and functions, both on and off the campus; b) to Public Safety personnel, faculty and personnel in areas of NYCCT which include but are not limited to the office of the registrar, the bursar, bookstore, the financial aid office, the library, cafeteria, elevators, hallways, etc.
- All forms of dishonesty that include but are not limited to fraud, cheating, plagiarism, knowingly furnishing false information to NYCCT, forgery, alteration or use of NYCCT's documents or instruments of identification with intent to defraud. See Academic Integrity Standards.
- Any behavior (physical or verbal) that interferes with the College's educational objectives or is harmful to the safety of the NYCCT community. This includes but is not limited to excessive noise, disorderly, lewd, indecent or obscene conduct or expressions, inappropriate intimate behavior, disruptive conduct in the classroom, and hazing or harassment of students for the purposes of initiation into a fraternity, sorority or other student club.
- Improper use, destruction or unauthorized removal of College property and/or the property of others.
- The unauthorized possession of regulated drugs; the possession, use or sale of illegal drugs on NYCCT grounds or facilities.
- Gambling on NYCCT premises.
- Smoking on NYCCT grounds or within 25 feet of entrances.
- The consumption or use of alcoholic beverages on the grounds and/or facilities of NYCCT, individually or at student social functions. This regulation does not apply to the use of alcoholic beverages as part of an academic program.
- Attendance in class or on the premises of NYCCT in a state of apparent intoxication. (A "state of intoxication" means a condition in which the mental or physical functioning of the individual appears to be impaired

as a result of the use of alcohol, drugs or medication and may thereby endanger the intoxicated student or other persons or property.)

- The sale of food or other goods in the cafeteria, other than those authorized for sale by the management of the cafeteria, during the contractual operating hours of the cafeteria.
- The sale of goods and services on the grounds or facilities of NYCCT except for purposes of fund raising by clubs and organizations that have been duly chartered by the Student Government Association and that have received prior permission from the Office of Student Affairs.
Note: Fund raising events are regulated by the Office of Student Affairs which has the authority to supervise all student events on the grounds or facilities of NYCCT.
- Posting of notices and announcements that have not been approved by the Office of Student Affairs.
- Failure to dispose of one's own debris and garbage in the proper receptacles situated throughout NYCCT.

PROCEDURES FOR DEALING WITH CONDUCT PROBLEMS

General Procedures

NYCCT Public Safety personnel have the responsibility for enforcing the student conduct regulations (exclusive of student attendance). They may cause any student to cease or refrain from any behavior that is in violation of College regulations, and are to report violations and violators immediately to the dean of students by means of a written citation issued to the alleged violator, in accordance with the procedures outlined in Section 15.3-15.7 of the bylaws of the Board of Trustees of The City University of New York.

Referral for disciplinary action may be initiated against student violators of College regulations by faculty members and staff, individual students and Public Safety personnel. They may not inflict any penalty on any student or threaten to do so. Penalties may be levied against students only after the procedures outlined in Section 15.0-15.6 of the bylaws of the board of trustees are followed.

Campus Services and Facilities

Accident Insurance

The Auxiliary Enterprise Board administers the accident insurance program and handles all claims on the policy. The accident insurance applies to all registered students for injuries that happen on campus and en route to and from campus. The cost of the policy is paid out of the student activity fee.

Bookstore

Operated by Follett Books, the New York City College of Technology bookstore is located in the Atrium Complex with an entrance facing Adams Street/Tech Place. New textbooks are offered at 5% discount from list price. A large supply of used books is generally available, particularly for early shoppers. These books are discounted 25% from list price. The store also carries many other items in addition to textbooks – general trade and reference books, school supplies, school spirit clothing and gifts, and convenience items are all available at the bookstore. For your convenience, the bookstore also offers extended hours during the first three weeks of each semester. These hours are posted outside the bookstore. The bookstore will also purchase back textbooks at the end of each semester for half of what you paid, provided the book will be used again the following term.

Food Services

Student food service facilities for day and evening students are located on the main floor of Namm Hall and the second floor of Voorhees Hall. Vending machines are also located at these locations. Special catering is available for College activities and events.

Lockers

An extremely limited number of lockers are available. These lockers are reserved for and issued to day students who are enrolled in programs that require the storage of laboratory clothing and laboratory materials. Students enrolled in such laboratory courses should inquire of the department laboratory personnel as to the issuance of lockers.

Lockers are assigned to students for the academic year only and must be vacated prior to the last day of the spring semester.

Property remaining in lockers after that date will be removed and discarded. The College is not responsible for property stored in these lockers.

Lost and Found

The College assumes no responsibility for lost property. A lost property section is maintained, however, so that lost property may be returned to its owner. Students finding property should surrender it at the lost property section. Students who lose property should report the loss to that section. The lost property section for the Namm Hall complex (Namm, Klitgord, Pearl and General Buildings) is located in Namm, room N 109.

Student Lounges

Lounges are available in each of the College buildings. They are open during the day and evening sessions for the convenience of all students. They must therefore be used in a considerate and proper manner at all times so that others are not deprived of their use. See the building directories or check with the building coordinators for the locations of the lounges.

Library

Maura Smale, Chair and Chief Librarian
Atrium Building, 4th floor
718.260.5497
email: msmale@citytech.cuny.edu

FACULTY:

Professors: Gonzalez, Smale
Associate Professors: Berger, Hounion, Leonard, Muchowski, Tidal, Tobin
Assistant Professors: Abrams, Almeida, Xu
Instructor: Cooney

LIBRARY

The Library Department offers classes and workshops to members of the college community, to support students, staff and faculty in conducting research and finding information appropriate for their needs. The Library's instructional focus is on strengthening students' information literacy competencies in finding, critically evaluating and ethically using information. Our courses address skills and proficiencies that are crucial for our students as they prepare to enter a variety of careers in the 21st century.

For more information about library facilities and services, see Academic Services and Special Programs [Click here](#).

COURSES:

LIB 1201

Research and Documentation in the Information Age

Pathways: Individual and Society

3 cl hrs, 3 cr

In this course students will explore issues in research and documentation for text (in print and online), images, sound and multimedia. We will investigate where information comes from and how it is organized in both traditional and emerging media. Students will examine the ethics of information use and determine how to critically evaluate sources. Throughout the course, students will create and present research and documentation projects using traditional and emerging media and technologies.

Prerequisite: ENG 1101

LIB 2205/ARCH 2205ID

Learning Places: Understanding the City

College Option: Interdisciplinary

1 cl hr, 4 lab hrs. 3 cr

This special topics course offers an interdisciplinary approach to investigating our built environment using a case study focused on a specific place each semester. This course combines physical examination with information research and data collection using methodologies developed in multiple disciplines. Students from a variety of departments engage in on-site exploration and in-depth research of a location in New York City.

Prerequisite: ENG 1101

SCHOOL OF ARTS AND SCIENCES

Justin Vazquez-Poritz, Interim Dean of Arts and Sciences
Namm Hall, room N 321
718.260.5008
email: jvazquez-poritz@citytech.cuny.edu

Denise Martin, Assistant to the Dean
email: dmartin@citytech.cuny.edu

Iva Williams, Secretary
email: iwilliams@citytech.cuny.edu

Raquel Martinez, College Assistant
email: rmartinez@citytech.cuny.edu

Departments:

African American Studies
Humanities

Biological Sciences
Mathematics

Chemistry
Physics

English
Social Science

Degree Programs:

Biomedical Informatics (BS)
Liberal Arts and Sciences (LAS)
Mathematics Education (BS)

Chemical Technology (AS)
Professional and Technical Writing (BS)
Applied Computational Physics (BS)

Applied Chemistry (BS)
Computer Science (AS)
CUNY Baccalaureate for Unique Interdisciplinary Studies
Liberal Arts (LAA)
Applied Mathematics (BS)

Mission

- Provide instruction which emphasizes the clear and effective use of language in speech and writing, including written analyses, argumentation, and research;
- Introduce the methods and body of knowledge that addresses the human experience of self, society, and the physical world;
- Provide students direct experience in observation and measurement of the natural world and an introduction to scientific methods and concepts;
- Provide access to fine arts and to an understanding of the motives and intents of artists.

The School of Arts and Sciences awards associate degrees in liberal arts and sciences, chemical technology and computer science.

Bachelor of science degrees in applied chemistry, applied mathematics, biomedical informatics, mathematics education, and professional and technical writing are also awarded. The CUNY Baccalaureate for Unique Interdisciplinary Studies Program is housed in the School of Arts and Sciences.

The courses offered within the School of Arts and Sciences provide the general education common and flexible core curriculum required of all technical and career programs.

Courses offered by the African American Studies Department are interdisciplinary and satisfy general education core requirements in World Cultures and Global Issues; US Experience in its Diversity; Individual and Society; and Creative Expression. An option in African American Studies within the LAA degree is available.

Courses within the departments of Biological Sciences, Chemistry and Physics satisfy the general education science core requirements and degree programs in Applied Chemistry, Biomedical Informatics, Chemical Technology, and Applied Computational Physics.

The courses offered by the English Department satisfy the communication and literature core requirements, and provide instruction in developmental reading, writing and English as a second language. These courses fulfill both common and flexible core general education requirements.

The bachelor of science degree in Professional and Technical Writing offered by the English Department is an interdisciplinary program that prepares students to communicate effectively using a variety of tools and media and to learn how to translate difficult technical concepts and complex procedural jargon into accessible prose and attractive visual presentations.

The Humanities Department offers courses in French, Spanish, Mandarin Chinese, Arabic, American Sign Language, art history, music, performing arts, Latin American studies, theatre and speech. These courses satisfy foreign language, aesthetics and communication requirements of the general education flexible core, or can be taken as enriching electives.

The Applied Math, Computer Science and Mathematics Education degree programs are housed in the Mathematics Department, which offers the courses required for the mathematics core requirements, as well as developmental math.

The Social Science Department offers courses in anthropology, economics, geography, government, history, philosophy, psychology and sociology. These courses satisfy the behavioral science, social science and philosophy requirements of the general education flexible core.

In addition to teaching, faculty members are engaged in research and other scholarly activities which provide opportunities for students to receive stipends for work as undergraduate research assistants. Sponsors of stipends include the National Science Foundation Louis Stokes Alliance for Minority Participation (NSF LSAMP) Program, the Emerging Scholars Program, the CUNY Research Scholars Program and the Baccalaureate Student Research Scholars Program. Qualified students may also participate in the Honors Scholars program or arrange with faculty members to take honors courses.

The courses offered by the three Schools at City Tech – Arts and Sciences, Professional Studies and Technology and Design – provide students with a rare blend of specialized instruction, combined with a broad education in the liberal arts and sciences, creating a foundation for professional success, personal development and lifelong learning.

African American Studies

Professor Lise Hunter, Acting Chair
Atrium Building, room A 643
718.260.5205
email: lhunter@citytech.cuny.edu

FACULTY:

Associate Professors: Botchway, Effinger-Crichlow
Assistant Professors: Bennett, Boone, James, Marcelina Evangelista

AFRICAN AMERICAN STUDIES

The Department of African American Studies offers traditional and interdisciplinary academic courses in the Arts (music/dance/visual arts), Literature (African/African American/Afro-Caribbean), and the Social Sciences (History/Anthropology/Political Science). Beyond the traditional lecture-based classroom instruction, AFR courses also utilize the place-based learning module. As such, students attend field trips to New York City Museums, the United Nations, the African Burial Grounds, The National Black Theater, and New York City Hip Hop archives and landmarks. Interdisciplinary courses also expose students to guest lecturers, experts in the field, over the course of a given semester.

A School of Arts & Sciences program, the Department's primary goal is to bring into focus—through its intellectual, varied, and unique course offerings—the study of the peoples of the African Diaspora and their historical and cultural contributions from the antiquity to the present.

Option in African American Studies

Add a specialty to your associate degree in Liberal Arts (LAA) with an option in African American Studies. An option is an opportunity for a student to participate in focused or concentrated academic study

COURSES:

AFR 1130

Africana Folklore

Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

A study of African folklore on the African continent and the African Diaspora. As a "bridge course," Africana Folklore is specifically designed for students who are not CUNY reading and writing proficient. *Prerequisite: None*

AFR 1131

African Dance Workshop

1 cl hr, 2 lab hrs, 2 cr

A study of the music and dance traditions indigenous to the cultures found in Africa. *Prerequisite: None*

AFR 1132

African American/Caribbean Dance Workshop

1 cl hr, 2 lab hrs, 2 cr

A performance arts course exposing students to the various forms of ceremonial and recreational dance movements traditionally performed by peoples of African descent in the Caribbean, Brazil and the United States. *Prerequisite: None*

AFR 1301

Introduction to the Art of Africa

Pathways: Creative Expression

3 cl hrs, 3 cr

A survey course designed as an introduction to the historical study of the plastic arts produced by the

indigenous people of Africa. *Prerequisites: CUNY proficiency in reading and writing*

Articulation Agreements

Currently, the AFR Option holds a binding Articulation Agreement with the CUNY Baccalaureate For Unique and Interdisciplinary Studies Degree Program (CUNY BA).

See the complete degree requirements for the associate in arts in Liberal Arts and Sciences

AFR OPTION REQUIREMENTS

To satisfy the AFR Option, select three courses from the list when choosing Flexible Core and elective courses, plus the required capstone.

World Cultures and Global Issues

AFR 2222	Current Caribbean Literature
AFR 1460	Early African History
AFR 1462	Blacks in Science, Technology and Business

US Experience in its Diversity

AFR 2201	Early Black Writers
AFR 1501	Community Problems
AFR 1465	Early African American History

Individual and Society

AFR 2250	Black Women in Literature
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Creative Expression

AFR 1301	Introduction to the Art of Africa
AFR 1311	African American/Caribbean Music

CAPSTONE

Philosophy	AFR 2612: African Philosophy and Religion
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TOTAL CREDITS REQUIRED FOR THE OPTION

12

indigenous people of Africa.

Prerequisites: CUNY proficiency in reading and writing

AFR 1304

African American Art

Pathways: Creative Expression

3 cl hrs, 3 cr

A survey of 18th, 19th, and 20th century Black art from the United States. Examples of prominent artists, their backgrounds and techniques are explored. In addition, the major political, economic and social circumstances which influenced the time period of their art and which give insight into the artists' creations will be reviewed. The traditional aesthetics, qualities and characteristics of art forms are analyzed. Slides, lectures, discussions and museum/

gallery trips are included.

Prerequisite: CUNY proficiency in reading and writing

AFR 1308

Caribbean Art

3 cl hrs, 3 cr

A history of the visual arts and artists from the Caribbean region from its earliest origins to the present. Students explore both the historical and contemporary significance of the art from its earliest origins to the present. This course examines the roots, main currents, forms, styles, content, aesthetics and ideological dimensions of Caribbean art, as well as the extent to which it has captured the essence of the Black experience. *Prerequisite: CUNY proficiency in reading and writing*

AFR 1311
African American/Caribbean Music

Pathways: Creative Expression

3 cl hrs, 3 cr

A study of African American and Caribbean music, traced historically from their African origins.

Prerequisite: CUNY proficiency in reading and writing

AFR 1321
Black Theater

Pathways: Creative Expression

3 cl hrs, 3 cr

A study of African American dramatic literature to explore the complex ways in which the black experience is constructed and presented by playwrights. In addition, students may have an opportunity to experience a New York theatrical production.

Prerequisites: CUNY proficiency in reading and writing or proficiency in reading; Corequisite: ENG 092W

AFR 1401
African Governments
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

A study of governance and politics in post-colonial Africa.

Prerequisite: CUNY proficiency in reading and writing

AFR 1460
Early African History
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

A study of Africa's history from antiquity to the period before the advent of colonialism. This course begins with a study of Africa as the cradle of humankind and continues through the emergence of small-scale societies and large state systems such as ancient Egypt, Nubia, the central African kingdoms and those of Southern Africa.

Prerequisite: CUNY proficiency in reading and writing

AFR 1461
Modern African History
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

An in-depth study of the second entry of Europeans into Africa. Students will survey the colonial period, the struggle for nationalism, birth of the independent African state and the challenges of nation-building. This course enables students to study the making of contemporary Africa.

Prerequisite: CUNY proficiency in reading and writing

AFR 1462
Blacks in Science, Technology and Business

Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

An examination of the contributions of Black people to the development of science, technology and business.

Prerequisite: CUNY proficiency in reading and writing

AFR 1465
Early African American History

Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

A factual, conceptual and chronological survey of the African-American peoples from their African origins to the end of the American Civil War in 1865. The central organizational theme is the three-and-one-half century-long struggle of African Americans to assert their human dignity, rights, potentials and contributions in the context of Euro-American social orders and processes.

Prerequisite: CUNY proficiency in reading and writing

AFR 1466
Modern African American History

Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

A study of the history of African Americans from the Emancipation Proclamation of January 1863 to the present.

Prerequisite: CUNY proficiency in reading and writing

AFR 1467
Afro-Caribbean History
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

A survey course in Caribbean history to explore the cultural, economic and political factors that shaped the Caribbean from the early years of European settlement to the present.

Prerequisite: CUNY proficiency in reading and writing

AFR 1501
Seminar in Current Community Problems

Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

An examination of the sociological, political, psychological and economic challenges within the Black community.

Prerequisite: CUNY proficiency in reading and writing

AFR 1502
The Sociology of Urban Poverty

Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

A study of the relationship between poverty and the Black urban community. Students will critically evaluate the causes and solutions to problems of poverty and inequality.

Prerequisite: CUNY proficiency in reading and writing

AFR 1503
Hip-Hop Worldview
Pathways: Creative Expression

3 cl hrs, 3 cr

This course explores the socio-historical realities of the Hip-Hop community, from its most visible recognition in the 1970s, to its current form. Students examine the historical, cultural, economic, and political dynamics out of which Hip-Hop culture emerges. This course takes an inductive approach so that students interpret the dominant styles, patterns, themes, eras, and personalities that make up the Hip-Hop culture and community.

Prerequisite: CUNY Proficiency in Reading and Writing

AFR 2000
Blacks in Media: Race, Gender and Cultural Representations
Pathways: Individual and Society

3 cl hrs, 3 cr

This course examines the complex dialogue between Black media representations and the lived cultural, social and historical experiences of people of African descent. It explores the interdependent roles of Black individuals, groups, and communities as cultural producers, consumers, and subjects of media representations and discourses.

Prerequisite: ENG 1101

AFR 2201
Early Black Writers in American Literature

Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

A study of the black writers' and their texts from the 18th century to the Harlem Renaissance.

Prerequisite: ENG 1101

AFR 2202
Contemporary Black Writers in American Literature

Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

A study of the black writers' and their texts from the end of the Harlem Renaissance to the present.

Prerequisite: ENG 1101 and any AFR course

AFR 2211
Early African Literature

3 cl hrs, 3 cr

A study of selected pre-nineteenth century literatures of the African continent.

Prerequisite: ENG 1101

AFR 2212
Modern African Literature
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

A study of the major African writers from the mid-twentieth century to the present.

Prerequisite: ENG 1101

AFR 2222
Current Caribbean Literature
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

A comparative study of the major Caribbean writers from the mid-twentieth century to the present.

Prerequisite: ENG 1101

AFR 2250
Black Women in Literature
Pathways: Individual and Society

3 cl hrs, 3 cr

A survey course to examine a wide array of themes covered by Black women writers. Students will address questions of race, gender, sexuality and class.

Prerequisite: ENG 1101

AFR 2302
Art and Architecture of Africa
Pathways: Creative Expression

3 cl hrs, 3 cr

A study of the arts and architecture produced by the indigenous African societies of Ancient Egypt, Libya, Algeria, Nubia, Ethiopia and the countries of Central, Eastern and Southern Africa.

Prerequisite: ENG 1101

AFR 2402
The Heritage of Imperialism

3 cl hrs, 3 cr

An examination of the thought, structure, operation and results of imperialism in human history generally, and the 19th/20th centuries in particular. European/American imperialism in the non-white areas of the world: the role of the Industrial Revolution; the imposition of Western European institutions on indigenous peoples of Africa, Asia, North/South America; colonialism; attempts by these people to reestablish autonomous sociological and cultural systems.

Prerequisite: ENG 1101 and any AFR course

AFR 2402ID**The Heritage of Imperialism**

College Option: Interdisciplinary

3 cl hrs, 3 cr

An examination of the thought, structure, operation and results of imperialism in human history generally, and the 19th/20th centuries in particular. European/American imperialism in the non-white areas of the world: the role of the Industrial Revolution; the imposition of Western European institutions on indigenous peoples of Africa, Asia, North/South America; colonialism; attempts by these people to reestablish autonomous sociological and cultural systems.

Prerequisite: ENG 1101 and any AFR course

AFR 2612**Africana Philosophy and Religion**

Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

An examination of the interplay of philosophy and religion in the Africana world. The course also covers the cosmological, ontological and epistemological aspects of Africana Philosophy.

Pre- or corequisites: ENG 1101, background in Humanities and Social Science and department approval required

AFR 3000ID**Black New York**

Pathways: US Experience in Its Diversity

College Option: Interdisciplinary

3 cl hrs, 3 cr

Using history, literature, the arts, politics, and sociology, this interdisciplinary course seeks to trace the Africana presence in New York from the 1600s to the present. This localized course will enable students to examine the varied ways in which people of African descent in the Diaspora have helped to shape the complex identity of New York City over time. Readings, films, music, information literacy sources, and local cultural and research institutions will be used to examine topics, such as slavery, resistance, migration, immigration, labor, Civil Rights, popular culture, gender politics, and gentrification. Sites of inquiry in the five boroughs may include, but are not limited to, the African Burial Ground, San Juan Hill, and Harlem in Manhattan, Sandy Ground in Staten Island, Weeksville, Bedford-Stuyvesant, Crown Heights, and Flatbush in Brooklyn, the South Bronx, and Addisleigh Park in Queens.

Prerequisite: ENG 1101 and any AFR course

Biological Sciences

Professor Laina Karthikeyan, Chair
Pearl Building, room P 305
718.260.5088
email: lkarthikeyan@citytech.cuny.edu

Professor Joanne Weinreb, Coordinator, Biomedical Informatics
Pearl Building, room P 410
718.260.5088
email: jweinreb@citytech.cuny.edu

PROGRAM

Biomedical Informatics/BS

FACULTY:

Professor: Dabydeen, Kolchenko
Associate Professors: Bakewicz, Chakraborty, Karthikeyan, Samarrai, Tsenova, Voza
Assistant Professors: Alcendor, Astrof, Barjis, Blair, Brugler, Giannopoulou, Haque, Li, Solis, Seto, Weinreb Daniels, Zahran, Zameer
Lecturer: Sodeinde

Chief CLT: Brekman
Senior CLTs: Breeland, Elliot, Rudsky

BIOLOGICAL SCIENCES

Biological sciences encompass a wide range of fields in the natural sciences devoted to the study of life, from the complex molecular components that constitute living organisms to the intricate ecosystems in which they exist and interact. Study of biological sciences will enhance your understanding of yourself and will heighten your awareness of your place in the natural world.

Courses offered in the department serve the needs of the entire College community. Specific courses are required by a number of health-related programs. Courses offered by the department also satisfy the laboratory science general education requirement or may serve as electives. The two-semester, 8-credit sequence in introductory biology (BIO 1101 and BIO 1201) serves as a foundation that prepares students for further education in the biological sciences. This sequence satisfies the general biology requirement for admission to all professional health programs.

The department also offers a baccalaureate degree program (BS) in Biomedical Informatics. The program equips students with the knowledge and technical skills needed to navigate the mass of biological and biomedical data that is increasingly driving new developments in pharmacology and therapeutics, molecular biology, biomedical science, and healthcare. The program is interdisciplinary, connecting expertise in computer science, molecular biology, statistics, and healthcare. Upon completing the program, students have a wide range of career options, from direct employment to continuation of studies in graduate school. In addition, with the proper selection of electives, the program can serve as a springboard to medical school.

Bachelor of Science in BIOMEDICAL INFORMATICS

The Biomedical Informatics baccalaureate program is designed to provide well-rounded, interdisciplinary training for a new generation of biomedical and healthcare workers prepared to meet the challenges of today and of the future. A rigorous core of courses provides students with a strong foundation from which to develop competencies in two interrelated component areas of Biomedical Informatics: Molecular Bioinformatics, centered on the use of conformational and genomic data to elucidate biological phenomena; and Health Informatics, focused on the secure electronic storage, retrieval, and use of biomedical information in healthcare delivery and research. This dual focus gives students a broad understanding of the critical importance of informatics for a wide range of biomedical and health applications. These two subfields are seeing an exciting integration in cutting edge medicine as genomic information is used increasingly in medical diagnosis and care. The dual focus of the program seeks to prepare students for a range of career options and to adapt to changing conditions in the field.

Student knowledge acquired in the college classroom and laboratory is reinforced by college-sponsored internships (for credit) at clinical and research locations in the region. Because Biomedical Informatics is a rapidly evolving field, it is important that students benefit from City Tech's strong General Education requirements and courses, so as to be able to adapt to changes in this field as creative thinkers and lifelong learners. The goal of the program is not only to provide students with the training they need to enter this growing field in its current state, but also with the personal and intellectual resources to participate in and lead its inevitable advances and transformations.

The program curriculum is designed to meet the following learning goals:

1. A broad general education which lays the ground work for lifelong learning, and prepares for future education at the graduate level.
2. Ability to communicate effectively with other members of the healthcare and information technology professions and research fields.
3. Competencies in general biological sciences and in the fundamentals of computer technology and computer programming.
4. In-depth knowledge of and skills in:
 - a. Computational and mathematical basis of molecular biology and molecular bioinformatics;
 - b. Large databases of biomolecular sequence, structure, expression, and interactions, as well as the use of standard bioinformatics software for the retrieval and analysis of information from such databases for biomedical applications;
 - c. Healthcare information systems analysis and design, including healthcare database structures, data security, privacy, confidentiality, and associated legal and ethical issues;
 - d. The growing application of molecular bioinformatics in cutting edge medical diagnosis and treatment.

Admission into the Program

Students applying for admission must meet the College standards for admission into a baccalaureate program, must have one year of high school biology or chemistry and must have completed the following requirements:

- One semester of college-level English with a grade of C or higher
- Be eligible to enroll in MAT 1375 (or have completed MAT 1275 or the equivalent with a grade of C or higher)
- BIO 1101 or the equivalent with a grade of C or higher
- CST 1101 or the equivalent with a grade of C or higher

In addition, transfer students must have a minimum cumulative GPA of 2.5

- Exceptions can be made with the permission of the department chairperson.

Progression and Graduation Requirements

- Students must maintain a cumulative GPA of 2.5
- Students must achieve a C or higher, in all required courses in the major.*
- Students can only repeat a required course once**

*The Biomedical Informatics BS degree program stipulates student must achieve a grade of "C" or better, in each course in the major. A student who has earned a grade lower than "C" in any course in the major must contact the Chairperson in order to repeat that course. For all other courses the student must contact the Registrar to obtain permission to repeat a course. A course may only be repeated once. Please note that a minimum grade point average of 2.5 is required for progression within the Biomedical Informatics curriculum. Students who fall below a 2.5 grade point average are required to arrange a meeting with the Department Chairperson, to discuss plans to improve their academic standing.

** In the case of extenuating circumstances (family bereavement, illness), a student could repeat a second time if given permission by the Departmental Chair.

GENERAL EDUCATION COMMON CORE 42 CREDITS

I – REQUIRED CORE¹ (4 COURSES, 12 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning² (1 course, 3 credits)

Any Approved Course

Life and Physical Sciences (1 course, 3 credits)

Any Approved Course

II – FLEXIBLE CORE (6 COURSES, 18 CREDITS)

Select one course from each of the following areas; plus one additional course from any of the five areas; no more than two courses may be selected from any discipline. 18

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Individual and Society

Any Approved Course

Creative Expression

Any Approved Course

Scientific World

Any Approved Course

One Additional Course from Any Group

III – COLLEGE OPTION REQUIREMENT³ (12-13 CREDITS)

- One course in Speech/Oral Communication⁴ 3
- One interdisciplinary Liberal Arts and Sciences course 3
- Two additional liberal arts courses or in BTech programs, additional liberal arts credits to reach a minimum total of 42 credits in general education.

In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language⁵. 6

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 76-77 CREDITS

Biological Sciences and Molecular Informatics (37 credits)

BIO 1101	Biology I	4
BIO 1201	Biology II	4
BIO 2450	Genetics	4

Math and Computer Science

13-14

MAT 1475	Calculus I ⁵	4
MAT 1372	Statistics with Probability	
	or	
MAT 2572	Probability and Mathematical Statistics	3-4
CST 1101	Problem Solving with Computer Programming	3
CST 1201	Programming Fundamentals	
	or	
CST 2403	C++ Programming I	3

Biomedical Informatics

12

BIO 2000	Introduction to Biomedical Informatics	2
BIO 2110	Programming for Biologists	4
BIO 4050	Colloquium	1
MED 3910	Internship	5

Students must complete all courses in one of the following concentrations:

Concentration 1: Bioinformatics

25-30

CHEM 1110	General Chemistry I	4
CHEM 1210	General Chemistry II	
	or	
BIO 2250	Evolution	
	or	
CST 1204	Database System Fundamentals	3-4
BIO 3350	Bioinformatics I	4
BIO 3352	Bioinformatics II	4
BIO 3620	Molecular and Cell Biology	4

Concentration 1 Electives

Choose 2 courses from the following list

BIO 3354	Computational Genomics	3
BIO 3356	Molecular Modeling in Biology	3
BIO 3302	Microbiology	4
BIO 3601	Biochemistry	4
CHEM 2223	Organic Chemistry I	5
CHEM 2323	Organic Chemistry II	5

Concentration 2: Medical Informatics

29-30

BIO 2311	Anatomy and Physiology I	4
BIO 2312	Anatomy and Physiology II	4
MED 2400	Medical Informatics Fundamentals	3
MED 4229	Healthcare Databases	3
CST 1204	Database System Fundamentals	3
PHIL 2203	Health Care Ethics	3

Concentration 2 Electives

Choose a minimum of 9 credits

HSA 3510	Health Services Management	3
HSA 3602	Health Services Management II	3
HSA 3630	Healthcare Finance	3
HSA 4910	Introduction to Public Health	3
CST 2307	Networking Fundamentals	3
BIO 3302	Microbiology	4
BIO 3526	Pathophysiology	3
BIO 3601	Biochemistry ⁶	4
CHEM 2223	Organic Chemistry I ⁶	5
CHEM 2323	Organic Chemistry II ⁶	5

Free elective credits to equal 120⁷

The number of free elective credits will vary depending upon the program-specific courses students use to meet Common Core requirements. The choice of electives should ideally reflect the student's interests, post-baccalaureate study plans, and career goals.

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE CREDITS	78
TOTAL GENERAL EDUCATION COMMON CORE CREDITS	42
TOTAL CREDITS REQUIRED FOR THE DEGREE	120

1 Students are strongly urged to consult degree requirements for "double-duty" courses: degree requirements that also meet CUNY Pathways general education requirements in that category.

2 Biomedical Informatics is a STEM degree program, requiring 4 or 5 credit courses in mathematics and science. Students may elect to use their required 4 or 5 credit Math or science courses to meet Common Core requirements in Mathematical and Quantitative Reasoning, Life and Physical Sciences, or Scientific World.

3 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

4 Students who have already met this requirement by taking COM 1330 or higher may choose any other liberal arts and science course in its place.

5 Students who do not have sufficient background in mathematics to place into MAT1475 can take MAT1275 and MAT1375 to satisfy the Math and Quantitative Reasoning and Scientific World or elective requirements in order to complete the degree with no more than 120 credits.

6 To be able to take these courses, students must take CHEM 1110 and CHEM 1210 as part of their general education or elective choices. Please consult a faculty advisor for more details.

7 The number of free elective credits will vary depending upon the program-specific courses students use to meet Common Core requirements as part of their general education or elective choices. Please consult a faculty advisor for more details.

COURSES:

BIO 1100

Human Biology

Pathways: Life and Physical Sciences

3 cl hrs, 3 cr

This course includes selected biological concepts, including the chemical basis of life, cell structure and division, a broad survey of the major systems of the human body with a special emphasis on human health, disease, human evolution and ecology. This course provides students who do not plan to continue in the sciences or pre-health programs with a working knowledge of life science that will be useful in making informed decisions on health and the environment.

Prerequisite: CUNY proficiency in reading, writing (or concurrent enrollment in ENG 092W, ESOL 021W, or ESOL 031W) and math (or concurrent enrollment in MAT 0650)

BIO 1101

Biology I

Pathways: Life and Physical Sciences, Scientific World

3 cl hrs, 3 lab hrs, 4 cr

The fundamental principles of biology, focusing on topics including taxonomy, structure, nutrition, reproduction, heredity, development and evolution. The concepts of molecular biology and DNA fingerprinting using representative plants and animals are introduced. The course also includes the use and care of the microscope.

Prerequisite: CUNY proficiency in reading

BIO 2000

Introduction to Biomedical Informatics

2 cl hrs, 2 cr

An introduction to the field of Biomedical Informatics for prospective majors. The course explores the application of computation in the biomedical sciences and in healthcare and provides an overview of the two components of the field, bioinformatics and medical informatics, their respective histories, technologies and methodologies.

The course also illuminates the ways these two components come together in cutting edge applications in healthcare such as precision medicine. Exposure to these two subfields should provide students with the ability to choose which track to pursue in the major.

BIO 2110

Programming for Biologists

2 cl hrs, 4 lab hrs, 4 cr

Foundational training in programming for Biomedical Informatics students. Hands-on exercises will introduce students to the usage of Unix, scripting language and biomedical informatics tools needed for their research. Lectures cover theoretical concepts and the labs will provide direct application to biomedical informatics systems.

Prerequisite: BIO 2000

BIO 2250

Evolution

3 cl hrs, 3 cr

A broad exploration of evolutionary science. Students review the history of evolutionary thought and science; genetics; the main mechanisms and forces that drive evolution; and the tools and findings of evolutionary research, including the evolution of humans and human behavior.

Prerequisite: BIO 1201

BIO 1201

Biology II

Pathways: Scientific World

3 cl hrs, 3 lab hrs, 4 cr

Continuation of Biology I with emphasis on the higher vertebrate systems. Biology I and II may be taken by science and non-science majors.

Prerequisite: BIO 1101

BIO 2311

Human Anatomy and Physiology I

Pathways: Life and Physical Sciences, Scientific World

3 cl hrs, 3 lab hrs, 4 cr

The anatomy and physiology of the cell, tissues, skeletal, muscular and nervous systems.

Prerequisites: 1) BIO 1101, or College-level general biology course with lab or a score of 85 or above on the New York State Regent's exam; and 2) CUNY proficiency in reading and writing

BIO 2312

Human Anatomy and Physiology II

Pathways: Scientific World

3 cl hrs, 3 lab hrs, 4 cr

A study of the circulatory, respiratory, digestive, urinary, endocrine and reproductive systems; intermediary metabolism, electrolyte and water balance.

Prerequisite: BIO 2311

BIO 2450

Genetics

2 cl hrs, 4 lab hrs, 4 cr

Introduction to fundamental concepts in classical and molecular genetics. Course topics provide a broad overview of relevant fields including Mendelian Inheritance, viral and bacterial genetics, molecular structure of genes, transcription and translation, genetic analysis, cancer genetics, and population and quantitative genetics. Laboratories complement lectures by providing a hands-on, inquiry-based approach to research questions in genetics through utilization of both wet-lab and computational methodologies.

Prerequisite: BIO 1201

BIO 3302

Microbiology

Pathways: Scientific World

2 cl hrs, 4 lab hrs, 4 cr

The fundamentals of microbiology. Lectures focus on the structure of prokaryotic and eukaryotic microorganisms, interaction between

the microbe and the host, and human diseases. Laboratory sessions focus on pure culture techniques, methods of staining and the microscopic, colonial and biochemical identification of saprophytic organisms.

Prerequisite: BIO 2311 or BIO 1101

BIO 3350 Elements of Bioinformatics (Bioinformatics I)

Pathways: Scientific World

2 cl hrs, 4 lab hrs, 4 cr

This course develops awareness of Internet-based information, and encourages exploration and use of the wide range of databases available to those working in the fields of Biology, Biotechnology and the Pharmaceutical industries. Different tools and computational methods are used to analyze DNA, RNA and protein structures. The course is designed to meet the increasing demand for individuals skilled in using computers to manipulate and analyze the growing quantities of genetic information available to bioscientists and the medical profession.

Prerequisites: MAT 1275 or higher, BIO 1101 and CUNY proficiency in reading and writing; *Note:* This course can fulfill the general education requirements for Science II (in place of BIO 1201).

BIO 3352 Bioinformatics II

2 cl hrs, 4 lab hrs, 4 cr

This course is a continuation of Elements of Bioinformatics. Advanced topics in structural bioinformatics, functional genomics, and evolutionary processes. The course covers molecular evolution and phylogenetics; protein structure and stability, protein folding, and computational structure prediction of proteins; proteomics; protein-nucleic acid interactions; RNA bioinformatics, microarray and expression data; and systems biology. The lab component of the course introduces computational tools used to implement analysis of sequence, structural, and functional data.

Prerequisite: BIO 3350

BIO 3354 Computational Genomics

3 cl hrs, 0 lab hrs, 3 cr

Covers selected advanced topics in computational genomics. Modern DNA microchips enable measurement of the activity state of tens of thousands of genes in a cell, and related techniques are being developed for measuring the protein contents. In this course students will utilize modern statistical and computational methods to understand biological processes. This course emphasizes studies of gene and cell function made possible by recent advances in measurement technology, statistical and computational methods.

Prerequisite: BIO 3352

BIO 3356 Molecular Modeling in Biology

3 cl hrs, 0 lab hrs, 3 cr

This course covers the applications of computer modeling and simulation to problems involving biological macromolecules. The targeted areas are in protein structure modeling, structure-based drug design, drug screening, cheminformatics, and intermolecular interactions and binding. Students will learn the theory and algorithms underlying a variety of simulation techniques.

Prerequisite: BIO 3352

BIO 3524 Nutrition

2 cl hrs, 2 cr

The nutrition constituent of foods, their metabolism and role in the body with emphasis on specific health problems, especially those involving nutritional deficiencies.

Prerequisite: BIO 2312

BIO 3526 Pathophysiology

3 cl hrs, 3 cr

This course applies knowledge of normal anatomy and physiology to promote a clear understanding of disease processes. It introduces the student to the common body responses and manifestations of disease that result from imbalances in homeostasis of the body. The course addresses common well-defined alterations involving cellular proliferation, mobility, neurology, digestion, circulation and immunity.

Prerequisites: CHEM 1110, BIO 2312, BIO 3302

BIO 3601 Biochemistry

3 cl hrs, 3 lab hrs, 4 cr

This course adopts an interdisciplinary approach to understanding the fundamentals of biochemistry, including an introduction to the basic concepts and most common research methods. The focus will be upon the major macromolecules and chemical properties of the living systems. The goal is the development of an integrated appreciation of how biomolecules act and interact to catalyze reactions, to synthesize and degrade biomolecules, and utilize or release energy. Both catabolic and biosynthetic pathways will be discussed. The biochemistry underlying the conversion of information contained in DNA to cellular macromolecules through replication, transcription and translation will be covered. Primary topics include the structure, function and metabolism of amino acids, proteins, carbohydrates, nucleic acids and lipids; the physical properties of water, pH, buffers and enzyme kinetics; DNA replication and gene regulation.

Prerequisites: BIO 1101, MAT 1275 or higher, ENG 1101 and CHEM 2223

BIO 3620 Molecular and Cell Biology

3 cl hrs, 3 lab hrs, 4 cr

An overview of eukaryotic cells including the molecular basis for its structure and functions. Topics introduce key principles of Cell Biology, including cellular energetics and biochemistry, roles of cell membranes and the detailed functions of organelles. Molecular structure of DNA, RNA and Proteins will be discussed as well as Transcription, Translation and Post-translational modifications. Cell signaling pathways, cell cycle and cell death will be discussed, with the detailed reference to its regulations. The laboratory component provides in-depth experimentation with the techniques and tools utilized in the study of molecular and cell biology.

Prerequisites: BIO 1101, ENG 1101

BIO 4050 Biomedical Informatics Colloquium

2 cl hrs, 1 cr

A seminar-based course that exposes students to current research topics in the fields of Bioinformatics and Medical Informatics. Weekly presentations by invited speakers and/or faculty introduce students to the broad diversity of research areas in both fields, and engages them in critical thinking and writing. Online lectures and reading activities will also be given periodically. This course is only offered once per year.

Prerequisite: BIO 3352 or MED 4229

MED 2400 Medical Informatics Fundamentals

3 cl hrs, 0 lab hrs, 3 cr

An introduction to the current practice of medical informatics. Major course topics address challenges related to the implementation of electronic health records (EHR) and other medical and healthcare databases in patient care settings, and their effective use in managing and improving personal and public health. Related topics include acquisition, storage, use and representation of medical data; medical terminology and associated databases; health information management and retrieval methods; privacy and security of health data; evidence-based medicine; and a survey of ethical, legal, and political issues at play in the technological shifts in the field of medical informatics.

Prerequisite: BIO 2311

MED 3910 Internship/Research in Biomedical Informatics

225 field hours total, 5 cr

An internship/research course that exposes majors to the practice of

medical informatics and molecular bioinformatics in commercial, research, and medical settings.

Prerequisites: MED 4229, BIO 3352, and program coordinator approval

MED 4229 Healthcare Databases

3 cl hrs, 3 cr

A one-semester course that provides students with the skills to conceptualize, design and use computer-based information systems to promote best practices and quality in healthcare. Students experience the design and maintenance of databases and implementation of model information systems to address healthcare problems encountered in today's clinical and research settings.

Prerequisites: MED 2400 and CST 1204

Chemistry

Professor Diana Samaroo, Chair
Pearl Building, room P 618
718.260.5850
email: dsamaroo@citytech.cuny.edu

PROGRAM:

Chemical Technology/AS
Applied Chemistry/BS

FACULTY:

Associate Professors: Brown, Deiner, Nicolas, Samaroo, Spellane
Assistant Professors: Martinez, Tewani

Senior CLT: Johnson

Associate in Science in CHEMICAL TECHNOLOGY

The associate degree program in Chemical Technology promotes an understanding of modern theory, applications and issues in chemistry; development of laboratory techniques and analytical skills; and enhanced communication skills with a focus on scientific writing. City Tech's AS curriculum includes classroom and laboratory course work in general and organic chemistry; the curriculum also requires courses in calculus, calculus-based general physics I and II, two elective courses in science or mathematics and all Pathways general education required courses.

The AS in Chemical Technology provides graduates with the foundations for a bachelor's degree or higher in disciplines such as chemistry, biochemistry, chemical engineering, education, applied mathematics and other related sciences. These programs may lead to admission to medical and dental schools, for highly qualified applicants. The AS in Chemical Technology also provides the preparation needed for transfer to professional schools in the health sciences in areas such as medical technology, pharmaceutical sciences and physician assistant programs. The majority of graduates pursue higher education in baccalaureate programs within the City University of New York.

We recommend that all students consult with faculty advisors in the Chemistry Department for assistance with their academic programs and selection of courses, as well as in their career planning. Students interested in continuing their studies in the College of Pharmacy at SUNY Buffalo or at the Arnold & Marie Schwartz College of Pharmacy at LIU should consult with their academic advisors and consider taking Biology courses including BIO 1101, BIO 1201 and BIO 2311.

The Chemical Technology program at City Tech is one of the few in the country to be approved by the American Chemical Society's (ACS) Chemical/Environmental Laboratory Technology program Approval Service (now part of ACS Two-Year Programs), signifying to industry that it meets quality standards similar to those of the most effective chemistry-based programs in the U.S. An articulation agreement with the Chemistry Department at Hunter College facilitates transfer to their BA in Chemistry.

Chemical Technology Degree: Learning Outcomes

1. A sound understanding of the fundamental principles of chemistry, including: atomic and molecular structures and states of matter; methods for measuring matter and energy; uncertainty in scientific measurement; chemical thermodynamics and chemical kinetics; conservation of matter and the changes in composition and energy that accompany chemical reactions; mechanisms of chemical reactions; electrochemistry and energy conversion.
2. Skill in written and spoken communication, particularly in the field of chemistry and experimental science: facility with the language of chemistry, with chemical formulae and chemical nomenclature; facility with descriptions of chemical energy and chemical thermodynamics.
3. Skill in experimentation and scientific method: knowledge and experience with techniques of chemical measurement and synthesis; understanding of the theoretical and mathematical principles of chemical analysis and chemical separations; experience with modern methods for spectroscopic identification of compounds.
4. Experience in the discovery and development of knowledge through experimental work and in the spoken and written presentation, discussion and critical analysis of scientific ideas.
5. Skill in problem solving, critical thinking and analytical reasoning.
6. A sound general education, including coursework specified under the CUNY Pathways Common Core.

Degree Requirements

The College will grant an associate in science (AS) degree with a major in Chemical Technology upon satisfactory completion of the required 60 credits.

GENERAL EDUCATION COMMON CORE ¹

33 CREDITS

I – REQUIRED CORE (4 COURSES, 14 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1475 or higher ²	Calculus I	4
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Life and Physical Sciences (1 course, 4 credits)

CHEM 1110	General Chemistry I	4
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II – FLEXIBLE CORE (6 COURSES, 19 CREDITS)

In addition to the required course listed below, select one course from each of the following areas, plus one additional course from any of the five areas; no more than two courses may be selected from any discipline.

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Individual and Society

Any Approved Course

Creative Expression

Any Approved Course

Scientific World

CHEM 1210 General Chemistry II

4

One Additional Course from Any Group

Any Approved Course

Writing Intensive Requirement³

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

28 CREDITS

REQUIRED

CHEM 1110	General Chemistry I	Met as GenEd
CHEM 1210	General Chemistry II	Met as GenEd
CHEM 2223	Organic Chemistry I	5
CHEM 2323	Organic Chemistry II	5
PHYS 1441	General Physics I: Calculus Based	5
PHYS 1442	General Physics II: Calculus Based	5

SCIENCE/MATHEMATICS ELECTIVES

Select 8 or more credits from the following:

BIO 1101	Biology I	4
BIO 1201	Biology II	4
BIO 2311	Human Anatomy and Physiology I	4
BIO 2312	Human Anatomy and Physiology II	4
BIO 3302	Microbiology	4
BIO 3350	Elements of Bioinformatics	4
BIO 3601	Biochemistry	4
CHEM 3312	Analytical Chemistry	5
CHEM 3412	Instrumental Methods of Analysis	5
MAT 1575	Calculus II	4
MAT 2675	Calculus III	4
PHYS 1117	Astronomy I	4
PHYS 1118	Astronomy II: Stars, Galaxies, Cosmology	4
PHYS 2443	Modern Physics	4
PHYS 2605	Laser Physics and Photonics	4
MATH 1476L	Calculus Laboratory	1
CHEM 2411	Special Topics in Chemistry	3
IS 9010	Independent Study	1-3

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES

28

TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS

33

TOTAL CREDITS REQUIRED FOR THE DEGREE

61

¹ For purposes of advisement, specific courses listed are "double-duty" courses: degree requirements that also meet CUNY Pathways general education requirements in that category. Students are not required to take these courses to meet their GenEd requirements; however, making a different choice may result in additional credits needed to complete the degree.

² Students without the requisite math background to enter MAT 1475 will be required to take MAT 1175, MAT 1275, and/or MAT 1375 in preparation. This will increase the number of required credits for the degree by 4-12 credits.

³ A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#)

Bachelor of Science in Applied Chemistry

The Bachelor of Science (BS) in Applied Chemistry is unique within the City University of New York. The program adapts City Tech's Chemistry Department offerings to meet the education requirements of 21st century laboratory science careers in and around New York City. The BS complements the existing AS in Chemical Technology. It provides a seamless path for AS Chemical Technology students to continue their studies. The degree has a 2+2 structure such that the AS in Chemical Technology is the first two years of the bachelor's degree.

Our curriculum is designed to provide a strong foundation in laboratory skills that will enable graduates to achieve "college-to-career" employment. This includes hands-on training in extensive laboratory course work, necessary for students to launch careers in chemical industry and in the broad range of industries that utilize analytical chemistry. While fulfilling its primary goal of excellent preparation for immediate entry into a career position, the program also prepare students for post-baccalaureate study and health profession schools because it meets all of the American Chemical Society's requirements for approval of bachelor's degree programs.

Program Highlights

The curriculum of the Bachelor of Science in Applied Chemistry is built on the premise that education in chemistry comprises five key areas:

1. Foundational knowledge: the background information that provides literacy and the ability to grow in a given field by providing the knowledge base needed for success in advanced courses and for understanding the broader context of the discipline. This includes instruction in General Chemistry, Organic Chemistry, Physical Chemistry, Biochemistry, Analytical Chemistry, and Inorganic Chemistry.
2. In depth content knowledge: the scientific and mathematical information that one needs to understand and tackle the broad range of materials, environmental, and pharmaceutical problems to which chemistry is applied. This includes five upper level Math/Science electives
3. Laboratory skills: necessary to function effectively in chemical and chemical analysis laboratories, including specific skills like operation of scientific equipment, and cross cutting skills like experimental design and data analysis. Higher level laboratory skills are developed in Analytical Chemistry, Instrumental Methods of Analysis, Advanced Spectroscopy and Advanced Chromatography.
4. Scientific communication skills: these include competency in scientific writing (lab reports, lab notebooks) and in oral communication. Required courses include two courses in English Composition, Advanced Technical Writing (offered in the English department), and a course in Public Speaking.
5. Internships: two semesters of 3-credit internship courses designed to provide the work experience that is essential when seeking employment.

Applied Chemistry Degree: Learning Outcomes

The discipline specific program level student learning outcomes are designed to ensure that students who earn City Tech's Applied Chemistry bachelor's degree will be ready to work independently in a laboratory setting and will add value to a laboratory team through their hands on skills and their ability to interpret data. The Applied Chemistry bachelor's degree learning outcomes are:

1. An understanding of the molecular nature of matter by describing atoms, molecules, and chemical bonding in terms of the relevant mathematical and spatial models; predict the products of chemical reactions based on knowledge of the phenomenological trends observed for organic molecules, inorganic compounds, and materials.
2. Skill in experimentation and use of modern spectroscopic, chromatographic, and electroanalytical techniques; evaluation of the safety risks associated with chemical experiments and use their evaluation to discern safe laboratory practices and behaviors.
3. Experience in locating and analyzing chemical literature in order to explain phenomena observed experimentally and in order to compare multiple sources of experimentally determined data. Additionally, analyze laboratory data in order to draw defensible conclusions and report the results of laboratory work in both written and oral forms.
4. Skill in solving scientific problems by designing experiments based on testable hypotheses; particular emphasis will be placed on designing experiments for common chemical problems such as identification of unknown samples
5. A understanding of the principles of chemistry including: structure/function relationship of macromolecules in a biological context; the differential aspects of transition metal chemistry, including coordination complexes and organometallic species and the chemical and physical laws that govern the functioning of spectroscopic and chromatographic measurements.
6. Skill in problem solving, critical thinking and analytical reasoning.
7. A comprehensive general education, including interdisciplinary coursework as well as coursework specified under the CUNY Pathways Common Core.

Admissions Criteria for the Bachelor of Science in Applied Chemistry

Incoming (Freshman) Students

- Minimum high school average of 75.
- Must be CUNY proficient (reading, writing, and mathematics)
- Must be prepared to enter MAT1275 or higher.

Continuing Students

- Must be CUNY proficient (reading, writing, and mathematics)
- May transfer from City Tech's Associate in Science (A.S.) in Chemical Technology degree or any equivalent A.S. program, either before or after completing the associate degree
- Must be prepared to enter MAT1275 or higher.
- Must have a minimum cumulative GPA of 2.0.

Transfer Students

- Must be CUNY proficient (reading, writing, and mathematics)
- Must have minimum cumulative GPA of 2.0.
- Must be prepared to enter MAT1275 or higher.

Degree Requirements

The College will grant a bachelor of science (BS) degree with a major in Applied Chemistry upon satisfactory completion of the required 120 credits.

GENERAL EDUCATION COMMON CORE

42 CREDITS

I – REQUIRED CORE¹ (4 COURSES, 14 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1475	Calculus I or higher	4
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Life and Physical Science (1 course, 4 credits)

CHEM 1110	General Chemistry I	4
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II – FLEXIBLE CORE (6 COURSES, 19 CREDITS)

From the list of approved courses select one course from each of the following areas; no more than two courses may be selected from any discipline.

World Cultures and Global Issues	3
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US Experience in its Diversity	3
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Creative Expression	3
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Individual and Society

LIB 1201	Research and Documentation in the Information Age (recommended)	3
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Scientific World

CHEM 1210	General Chemistry II (recommended)	4
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One additional course from any Flexible Core area	3
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III – COLLEGE OPTION REQUIREMENT² (12 CREDITS)

- One course in speech/oral communication³
COM 1330 Public Speaking or higher 3
- One interdisciplinary liberal arts and sciences course 3
- Two additional liberal arts courses to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language. 6

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from the Common Core and one from the Applied Chemistry program courses; and two additional courses designated WI for the baccalaureate level, one from Common Core and one from the Applied Chemistry degree program.

IV – PROGRAM-SPECIFIC DEGREE REQUIREMENTS (66 CREDITS)

CHEM 1110	General Chemistry I	Met as Gen Ed	
CHEM 1210	General Chemistry II	Met as Gen Ed	
CHEM 2223	Organic Chemistry I		5
CHEM 2323	Organic Chemistry II		5
BIO 1101	Biology I		4
PHYS 1441	General Physics I Calculus Based		5
PHYS 1442	General Physics II Calculus Based		5
CHEM 3312	Analytical Chemistry		5
CHEM 3412	Instrumental Methods of Analysis		5
CHEM 3222	Physical Chemistry: Thermodynamics and Kinetics		4
BIO 3601	Biochemistry		4
CHEM 3622	Inorganic Chemistry		4
CHEM 4312	Instrumental Chromatography		4
CHEM 4322	Advanced Spectroscopy		4
ENG 2575	Technical Writing		3
MAT 1475	Calculus I ⁴	Met as Gen Ed	
MAT 1575	Calculus II		4

Internship/Research

CHEM 4901	Internship/Research in Applied Chemistry I		3
CHEM 4902	Internship/Research in Applied Chemistry II		3

ELECTIVE CREDITS TO EQUAL OR EXCEED 120⁵

Choose courses from the following list to bring total number of credits to 120. The choice of electives, to be made in close consultation with the Program Coordinator or Academic Advisor, should ideally reflect the student's interests, post-baccalaureate study plans, and career goals.

SCIENCE AND MATHEMATICS ELECTIVE COURSES

BIO 2311/L	Anatomy and Physiology I (Lecture and Laboratory)		4
BIO 2312/L	Anatomy and Physiology II (Lecture and Laboratory)		4
BIO 3302/L	Microbiology (Lecture and Laboratory)		4
BIO 3350	Elements of Bioinformatics (Lecture and Laboratory)		4
BIO 3352	Bioinformatics (Lecture and Laboratory)		4
BIO 3354	Computational Genomics		3
BIO 3356	Molecular Modeling in Biology		3
BIO 3524	Nutrition		2
BIO 3526	Pathophysiology		3
BIO 3620/L	Molecular and Cell Biology (Lecture and Laboratory)		4
CHEM 2411	Special Topics		3
CHEM 4822	Medicinal Chemistry		3
CST 2403	Introductory C++ Programming Language Part I		3
CST 3503	C++ Programming Part II		3
MAT 2071	Introduction to Proofs and Logic		4
MAT 2440	Discrete Structures and Algorithms I		3
MAT 2540	Discrete Structures and Algorithms II		3
MAT 2572	Probability and Mathematical Statistics I		4
MAT 2580	Introduction to Linear Algebra		3
MAT 2588 ⁶	The Mathematics of Finance		3
MAT 2630 ⁶	Applied Mathematics Technology--Numerical Analysis		3
MAT 2675	Calculus III		4
MAT 2680	Differential Equations		3
MAT 3021	Number Theory		4
MAT 3050	Geometry I		4
MAT 3075	Introduction to Real Analysis		4
MAT 3080	Modern Algebra		4

MAT 3672	Probability and Mathematical Statistics II		4
MAT 3770 ⁶	Mathematical Modeling I – Optimization		3
MAT 3772	Stochastic Models		3
MAT 3777	Applied Mathematics: Applications of the Wave Equations		3
MAT 3787 ⁶	Applied Mathematics – Finite Fields		3
MAT 3788 ⁶	Applications of the Heat Equation for Financial Mathematics		3
MAT 3880	Introduction to Partial Differential Equations		3
MAT 4030	History of Mathematics		3
MAT 4050	Geometry II		3
MAT 4672	Computational Statistics with Applications		3
MAT 4788	Financial Risk Modeling		3
MAT 4872	Probability and Mathematical Statistics III		4
MAT 4880	Mathematical Modeling II		3
PHYS 2601/L	Introduction to Research (Lecture and Laboratory)		3
PHYS 2603/L	Physical Principles of Medical Imaging		3
PHYS 2605	Introduction to Laser Physics and Photonics		4
PHYS 2607	Introduction to Quantum Mechanics		3
PHYS 2609	Introduction to Quantum Computing		4

TOTAL GENERAL EDUCATION COMMON CORE CREDITS **42**

TOTAL ELECTIVE COURSES REQUIRED AND ELECTIVE CREDITS **78**

TOTAL CREDITS FOR DEGREE: **120**

1 Applied Chemistry is a STEM degree program, requiring 4 or 5 credit courses in mathematics and sciences. Student may elect to use their required 4 or 5 credit mathematics or science courses to meet Common Core requirements in "Mathematical and Quantitative Reasoning" and "Life and Physical Sciences." Note also that other science courses are identified as satisfying "Scientific World" courses in the Flexible Core.

2 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

3 Students who have already met this requirement may choose any other liberal arts and science course in its place.

4 Students who elect to take MAT 1475 without the requisite math background will be required to take MAT 1275, and/or 1375 in preparation, depending upon initial placement. This will increase the number of required credits for the degree by 4-8.

5 The number of free elective credits will vary depending upon the program-specific courses students use to meet Common Core requirements.

6 Students who wish to take MAT 2588 The Mathematics of Finance should be aware of the pre-and corequisites and arrange to take them as part of their flexible core and college option choices. Students who wish to take MAT 2630, MAT 3770, MAT 3787, or MAT 3788 should be aware of the prerequisite of CST 1101 and arrange to take it as part of their college option choices.

COURSES:

CHEM 1000

Principles of Chemistry

3 cl hrs, 3 lab hrs, 4 cr

Pathways: Life and Physical Sciences

A one-semester course that introduces basic aspects of general and organic chemistry, biochemistry, as well as developing problem-solving and mathematical skills at levels appropriate to students new to chemistry. Key concepts include: atomic structure, states of matter, stoichiometry and chemical reactions, chemical bonding, acid-base theory, solutions, functional groups, saturated and unsaturated hydrocarbons, carbohydrates and protein structure and function. (Note: For Dental Hygiene, Restorative Dentistry and Business and Technology of Fashion students only).

Prerequisites: Eligibility for ENG 092R or CUNY proficiency in reading and mathematics

CHEM 1110

General Chemistry I

Pathways: Life and Physical Sciences, Scientific World

3 cl hrs, 3 lab hrs, 4 cr

An introduction to the principles of general chemistry. As a first semester course in a two-part series, it provides the concepts of atomic structure, nomenclature, stoichiometry, behavior of gases, chemical bonding, and geometry and types of chemical reactions.

Pre- or corequisites: MAT 1275 or higher, ENG 092R

CHEM 1210

General Chemistry II

Pathways: Scientific World

3 cl hrs, 3 lab hrs, 4 cr

The second half of a full year introduction to the important concepts in college chemistry. Through lecture and laboratory work, students will learn the mathematical and conceptual models chemists use to explain the behavior of matter. Key concepts include: intermolecular interactions, solution phase phenomena, phase changes, chemical kinetics, equilibrium, acid/base reactions, and thermodynamics.

Prerequisites: CHEM 1110 and CUNY proficiency in writing or department approval

CHEM 2223

Organic Chemistry I

4 cl hrs, 3 lab hrs, 5 cr

An introduction to the fundamental concepts of nomenclature, structure, functional group chemistry, and reaction mechanisms of organic compounds. Topics include the chemistries of alkanes and alkyl

halides, stereochemistry, and SN1, SN2, E1, and E2 mechanisms. Laboratory exercises illustrate methods of preparation and measurement of organic compounds.
Prerequisite: CHEM 1210

CHEM 2323

Organic Chemistry II

4 cl hrs, 3 lab hrs, 5 cr

The second part of a two-semester sequence in organic chemistry. Topics include the chemistries of alcohols, ethers, conjugated and aromatic compounds, carbonyl compounds, and amines. The oxidation-reduction chemistry of organic compounds and properties of carbohydrates, amino acids, proteins, and nucleic acids are introduced. Laboratory work stresses the preparation and spectroscopic characterization of organic compounds.
Prerequisite: CHEM 2223

CHEM 2411

Special Topics in Chemistry

3 cl hrs, 3 cr

This course builds upon fundamental chemistry knowledge and skills to focus on various specific, contemporary topics in chemistry, including but not limited to pharmaceutical, biological, or materials chemistry. Readings and discussions based on original literature will offer students opportunity to study new subject matter in depth. The course will include presentations and emphasize effective communication and group work.
Prerequisite: CHEM 2223

Potential course substitutions include any 3000-level Chemistry courses or 2000-level Biology courses

CHEM 3222

Physical Chemistry: Thermodynamics and Kinetics

3 cl hrs, 3 lab hrs, 4 cr

Introduces the foundational ideas in thermodynamics and kinetics. Thermodynamics topics include First, Second and Third Laws of Thermodynamics, states of matter and phase transformations, equilibrium, Gibbs free energy and prediction of spontaneous reactions. Kinetics topics include reaction rates, rate laws and transition states. Thermodynamics and kinetics topics will be presented with emphasis on applications to industrial chemistry.
Prerequisites: CHEM 1210, PHYS 1442, MAT 1575 or higher

CHEM 3224

Chemical Safety

3 cl hrs, 3 cr

This course focuses on safety as an integral part of the design and execution of experimental work. The course includes an online textbook, online papers from experts in various areas of chemical health and safety and other resources available on the world wide web.

Prerequisites: CHEM 1110, CHEM 1210, CHEM 2223; Pre- or corequisite: CHEM 2323

CHEM 3312

Analytical Chemistry

3 cl hrs, 5 lab hrs, 5 cr

Theoretical and mathematical concepts of both gravimetric and volumetric analyses: quantitative separations, formation and properties of precipitates, use of organic reagents, coprecipitation phenomena, acidimetry and alkalimetry, pH, titration curves, redox reactions. Practice in fundamental laboratory techniques of gravimetric and volumetric analyses.
Prerequisite: CHEM 1210

CHEM 3412

Instrumental Methods of Analysis

3 cl hrs, 5 lab hrs, 5 cr

Introduction to modern instrumental methods including atomic force microscopy, infrared spectroscopy, visible and UV spectroscopies, gas and liquid chromatographies, and mass spectrometry.
Prerequisite: CHEM 1210

CHEM 3622

Inorganic Chemistry

3 cl hrs, 3 lab hrs, 4 cr

Fundamental concepts of inorganic chemistry. Students gain clear insights into essential concepts such as bonding theory, molecular orbitals, group theory, coordination chemistry, organometallic chemistry and bioinorganic chemistry, among others. In addition, the course is accompanied by a laboratory to properly settle the concepts learned during the lectures.
Prerequisite: CHEM 1210

CHEM 4312

Instrumental Chromatography

3 cl hrs, 3 lab hrs, 4 cr

In depth theoretical and hands-on experience with gas chromatography (GC), gas chromatography-mass spectrometry (GC-MS), high pressure liquid chromatography (HPLC) and liquid chromatography-mass spectrometry (LC-MS). Methods of sample preparation

prior to chromatographic analysis are also covered. These include liquid/liquid extraction, solid phase extraction and solid phase microextraction. Laboratory work emphasizes chromatographic methods development for applications in the pharmaceutical industry, in forensics labs and in environmental monitoring labs.

Prerequisite: CHEM 3412

CHEM 4322

Advanced Spectroscopy

3 cl hrs, 3 lab hrs, 4 cr

An overview of the quantum mechanical underpinnings of spectroscopy, the interaction of radiation with matter and molecular symmetry. It also covers the general features of a spectroscopic experiment, detailed experimental and theoretical understanding of rotational, vibrational and electronic spectroscopies and photoelectron and laser spectroscopies.
Prerequisites: CHEM 3222, CHEM 3412

CHEM 4822

Medicinal Chemistry

3 cl hrs, 3 cr

Focuses on chemistry applied to prevent or solve living organisms' health-related problems. A solid overview of fundamental concepts such as drug targets, pharmacodynamics and pharmacokinetics, and drug discovery/development, together with insights into particular selected topics of high impact on human lives (anti-viral agents, anti-cancer agents, anti-bacterial agents, etc.).
Prerequisite: CHEM 2323

CHEM 4901

Internship/Research in Applied Chemistry

135 field hrs, 3 cr

Provides hands-on experience in an applied setting. Students relate their internship experience to the knowledge, skills and values gained through college-level classroom teaching.
Prerequisites: Departmental approval and CHEM 2323 or CHEM 3412

CHEM 4902

Internship/Research in Applied Chemistry II

135 field hrs, 3 cr

A second internship/research experience that provides more hands-on experience in an applied setting. Students relate their internship experience to the knowledge, skills and values gained through college-level classroom teaching.
Prerequisite: Departmental approval and CHEM 4901

ESCI 1110**Environmental Science I****Pathways: Life and Physical Sciences**

3 cl hrs, lab hours are included in the class hours, 3 cr

An introductory environmental science course. Topics include fundamentals of environmental science; land and soil pollution; water quality and hydrology; air quality; wetlands. Maps, GIS, and the visualization of scientific information are emphasized.

Prerequisite: CUNY proficiency in reading and writing; Pre- or corequisite: MAT 1175 or higher

ESCI 1210**Environmental Science II****Pathways: Scientific World**

3 cl hrs, lab hours are included in the class hours, 3 cr

An introductory environmental science course. Topics include energy; ecosystems; solid and hazardous waste; pressure and temperature; volume, mass and flow; population growth; global warming; environmental management and economics. Maps, GIS, and the visualization of scientific information are emphasized.

Prerequisite: CUNY proficiency in reading and writing; Pre- or corequisite: MAT 1175 or higher

ESCI 2000ID**Energy Resources****College Option: Interdisciplinary**

3 cl hrs, 3 cr

This special topics interdisciplinary course surveys various energy resources: hydropower, solar, wind, geothermal and natural gas. Students learn about the scientific process of energy production and its applications. Students explore economic, social, political, and environmental impacts.

Prerequisites: ENG 1101, MAT 1275 or higher

English

Professor Nina Barnett, Chair
Namm Hall, room N 512
718.260.5392
email: nbarnett@citytech.cuny.edu

Professor Reneta Lansiquot, Program Director,
Professional and Technical Writing
Namm Hall, room N 503
718.260.5420
email: ptw@citytech.cuny.edu or rlansiqot@citytech.cuny.edu

PROGRAM:

Professional and Technical Writing/BS

FACULTY:

Professors: Barnett, Barlow, Falvey, Ferrell, Grujicic-Alatrisme, Guida, Hanley, Hellman, Huffman, Lansiquot, Nilles, Noonan, Rudden, Saddik, Williams
Associate Professors: But, Devers, Ferdinand, Goodison, Harris, Leston, Rodgers, Rosen, Scanlan, Shapiro
Assistant Professors: Behrent, Belli, Corbett, Do, Ellis, Garcia, Jeyaraj, Kwong, Miller, Ostrom, Porter, Sears, Westengard
Lecturer: Bear

ENGLISH

The English Department offers a full range of courses, from developmental work in reading and writing and English as a second language to introductory and advanced courses in writing and literature. The department participates in a collaborative and creative support system for all students. The department has as its mission the enhancement of those imaginative, analytical, reflective and cultural aspects of self generally addressed by liberal studies and within the department's specific purview, through written language.

All programs of study leading to a degree require the successful completion of ENG 1101, English Composition I, and all baccalaureate students are required to take ENG 1101 and ENG 1121. An additional number of credits in writing and literature are required for specific degree curricula. The student should consult with an advisor in the selection of English courses – degree requirements for each program are provided in the catalog description.

The English Department offers a range of courses that will allow students to meet the Pathways Flexible Core requirements in the following categories: World Cultures and Global Issues, US Experience in Its Diversity, Individual and Society, and Creative Expression. Please consult individual course descriptions for a particular course's Pathways designation. The department also offers upper-level literature courses that explore cutting-edge themes and expose students to faculty areas of specialization. Degree-credit courses offered by the English Department are divided into four categories. These are identified by numerical codes:

Series	Categories
1000	First-Year Writing Courses
2000	Second-Year Courses
3000	Third-Year Courses
4000	Fourth-Year Courses

For students not exempt from the CUNY Assessment tests in Writing and Reading and who score below the University-designated level on the CUNY Assessment Test in Writing (CATW) and Reading (ACT), non-credit courses in developmental reading and developmental writing (ENG 090R, ENG 090W, ENG 092R, ENG 092W) and English as a Second Language (ESOL 011W, ESOL 012R, ESOL 021W, ESOL 022R, ESOL 031W, ESOL 032R) are offered.

Bachelor of Science in PROFESSIONAL AND TECHNICAL WRITING

The Professional and Technical Writing program is designed to prepare students to communicate clearly and effectively using a variety of tools and media. Students gain competencies that include writing, editing, problem solving, document design, rhetoric, interpersonal communication, collaboration, specialized expertise, and fluency in modern communication technologies. Students learn how to translate complex, industry-specific information into lay terminology or another industry-specific discourse. This program has three components: (1) general education core courses, (2) required courses in the major, and (3) an area of specialization. Students in this interdisciplinary degree program gain strong communication skills and a solid knowledge base through specialization in a content area, namely, a professional, scientific, or technical discipline.

In order to meet the needs of the growing marketplace, the program allows students to look across disciplinary boundaries and bring together information and skills from a variety of fields into a new base for learning, designing, and writing. The structure of this degree ensures that students who graduate from this program (a) master industry standard applications for professional and technical writing and related technologies, (b) acquire expertise in a professional studies-related, science-related, or technology-related discipline that will give them an edge in the marketplace, and (c) enter a rapidly shifting workplace prepared to negotiate new forms of media with sophistication and confidence. The program provides students with both a hands-on experience using a range of tools as well as an understanding of the theories underlying the use of those tools. Graduates master industry standards for both professional and technical writing, as well as related technologies.

Admissions Criteria for BS Program in Professional and Technical Writing

Incoming Students

Students may enter the BS program in Professional and Technical Writing with a minimum high school average of 75, and must demonstrate CUNY proficiency in reading, writing, and mathematics.

Continuing Students

Students may enter the BS program in Professional and Technical Writing with CUNY proficiency in reading, writing, and mathematics. Moreover, students may transfer from one of the City Tech AAS, AA, AS, or unclassified programs either before or after completing the associate degree.

Transfer Students

Transfer students must have a minimum GPA of 2.0 and should have taken one semester of college-level English having earned a grade of C or higher. Transfer students must also possess CUNY proficiency in reading, writing, and mathematics.

The program's curriculum is designed for students to achieve the following learning outcomes:

- Understand and resolve legal and ethical issues surrounding publication
- Demonstrate a sophisticated understanding of visual rhetoric and writing in multimedia environments
- Describe technical information in readable prose for specialists and non-specialists
- Use professional tools for technical and professional communication
- Work and write collaboratively
- Evaluate, analyze, summarize, and vet information
- Match deliverables to an audience and purpose
- Create and defend a proposal both orally and in writing
- Conduct needs assessments
- Perform usability tests
- Understand issues of cultural diversity as they relate to written and digital communication

GENERAL EDUCATION COMMON CORE

42-45 CREDITS

I – REQUIRED CORE¹ (4 COURSES, 12-15 CREDITS)

English (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 3-4 credits)

Any approved course	3-4
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Life and Physical Sciences (1 course, 3-5 credits)³

Any approved course	3-5
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II – FLEXIBLE CORE (6 COURSES, 18 CREDITS)

From the list of approved courses select one course from each of the following areas; no more than two courses may be selected from any discipline.

World Cultures and Global Issues

Any approved course	3
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US Experience in its Diversity

Any approved course	3
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Individual and Society

Any approved course	3
---------------------	---

Creative Expression

Any approved course	3
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Scientific World

Any approved course	3
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One additional course from any group	3
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III – COLLEGE OPTION REQUIREMENT⁴ (12 CREDITS)

- One course in Speech/Oral Communication⁵
COM 1330 Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course 3
- Additional liberal arts credits to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS AND ELECTIVES

78 CREDITS

Professional and Technical Writing 36

ENG 1133	Specialized Communications for Technology Students	3
ENG 1710	Introduction to Language and Technology	4
ENG 2700	Introduction to Professional and Technical Writing	4
ENG 2720	Writing with New Media	4
ENG 2730	Professional Editing and Revising	4
ENG 3760	Digital Storytelling	4
ENG 3790	Information Architecture	4
LIB 1201	Research and Documentation for the Information Age	3
COM 3401	Business and Professional Communication	3

History Core Course 3

One course in the HIS1000 series or AFR 1460 or AFR 1461 or AFR 1465 or AFR 1466 or LATS 1462

HIS 3209	History of Technology	3
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Specialization 18

To provide depth in a content area, students must complete a minimum of 18 credits in a single professional, scientific, or technical discipline. Upon individual evaluation, students may be able to meet this requirement by using credits earned, for example, in an associate degree program.

ADDITIONAL REQUIRED COURSES (12 CREDITS)⁶

(Students take three of the courses listed to complete 12 upper-level credits in the major)

ENG 3770	Advanced Professional Writing	4
ENG 3775	Advanced Technical Writing	4
ENG 3780	Planning and Testing User Documents	4
CST 3559	Technical Documentation	4
ENG 4700	Special Topics in Professional and Technical Writing	4

Internship Course

ENG 4900 Professional and Technical Writing Internship 4

Elective Credits to equal 120

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 78

COMMON CORE 42⁷

TOTAL CREDITS REQUIRED FOR THE DEGREE 120

1 For purposes of advisement, specific courses listed are "double-duty" courses: degree requirements that also meet CUNY Pathways general education requirements in that category. Students are not required to take these courses to meet their GenEd requirements; however, making a different choice may result in additional credits needed to complete the degree.

2 Students intending to specialize in a STEM area are advised to take a STEM variant mathematics course

3 Students intending to specialize in a STEM area are advised to take a STEM variant science course.

4 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

5 Students who have already met this requirement may choose any other liberal arts and science course in its place.

6 Students must complete 12 upper-level credits in the major.

7 Total LAS credits, including electives and additional required courses, exceed 60.

ENGLISH for SPEAKERS of OTHER LANGUAGES (ESOL) and LINGUISTICS

Professor Lubie Grujicic-Alatriste, Program Coordinator
Namm Hall, room N 503
718.260.5208

email: esol@citytech.cuny.edu or latriste@citytech.cuny.edu

The program in English for speakers of other languages offers specialized courses in the areas of reading, writing (composition/grammar) and speaking skills for non-native speakers. Students are identified as appropriate for courses in ESOL on the basis of the CUNY Assessment Test in Writing (CATW) and in Reading (ACT) and personal interviews at initial advisement. Those who meet the placement criteria on the CUNY Assessment Test in Writing and Reading or are exempt but feel they need additional preparation for college work in English are welcome to inquire about taking these courses as well. The speaking skills course, ESOL 1300, is a credit-bearing course. Courses in writing (composition/grammar) and reading skills do not carry credit, but do help prepare students for the CUNY Assessment Tests in Writing and Reading as well as for general academic work.

A minimum score of 32 on the CUNY Assessment Test in Writing is required for admission to the ESOL program. Students taking ESOL courses are enrolled in regular full- or part-time College programs. ESOL students with a score less than 32 on the CUNY Assessment Test in Writing will automatically be referred to the CUNY Language Immersion Program (CLIP), where students work full-time on English language skills without being enrolled in College courses.

ESOL courses in writing (composition/grammar) and reading are offered at three levels. Entering students are placed in one of the first two levels of each discipline on the basis of their CUNY Assessment Test scores in Writing and Reading, and then advance to the next level in that discipline as they pass each course. The third level may be entered only by passing the preceding second-level course. Retests in writing and reading are offered at the end of the third-level courses to all students in those courses whose attendance and performance have been satisfactory. Retests may be offered at the end of the second-level courses, by recommendation of the instructor and at the discretion of the ESOL Coordinator, to students whose attendance and performance in those courses has been excellent. Retests are not offered in the first-level courses. Retests are also offered in inter-semester University Summer Immersion Program (USIP) courses and in CLIP. Students exiting those courses are placed in ESOL courses on the basis of their CUNY

Assessment Test scores. Students who meet the CUNY placement criteria in both writing and reading are eligible to take the credit-bearing ENG 1101, English Composition I, required of all students.

Information about course numbering and class hours is summarized below:

	Level I	Level II	Level III
Composition/	ESOL 011W	ESOL 021W	ESOL 031W
Grammar	6 hrs	6 hrs	3 hrs
Reading	ESOL 012R	ESOL 022R	ESOL 032R
	3 hrs	3 hrs	3 hrs

ESOL 1300, Oral Expression for English Language Learners may be taken by any student who is taking any ESOL course, with either reading proficiency or department approval. Students in ESOL 1300 will be evaluated by ESOL faculty, and those with near-native speaking skills may be referred to a comparable course for native speakers.

COURSES:

ENG 090R

Developmental Reading Level I and II

5 cl hrs, 0 cr

The first half of the course focuses on basic reading comprehension, vocabulary skills, the use of the dictionary, note taking and study skills. The second half focuses on improving reading comprehension to meet the demands of college-level reading assignments.

Prerequisite: A score of 59 or below on the CUNY Assessment Test in Reading (ACT)

ENG 092R

Developmental Reading Level II

3 cl hrs, 0 cr

Designed to improve reading comprehension to a level adequate for successfully meeting the demands of college-level reading; uses excerpts from college textbooks, timed reading exercises and supplementary books and periodical materials for literal and interpretative comprehension. CUNY proficiency in reading is the exit criterion for this course.

Prerequisite: A score of 60-69 on the CUNY Assessment Test in Reading (ACT) or Satisfactory in ENG 090R without reading proficiency

ENG 092R.1 and ENG 092W.1 are combined Developmental Reading Level II and Developmental Writing II courses for students not proficient in both reading and writing. 6 cl hrs, 0 cr. *Prerequisite:* Eligibility for ENG 092W and ENG 092R

ENG 090W

Developmental Writing I and II

6 cl hrs, 0 cr

The first half of the course focuses on instruction in varied sentence patterns, basic grammar and punctuation, spelling, the use of the dictionary and in composing paragraphs that are organized and support a main idea. The second half focuses on the composing of essays that are developed, organized and correct. Short readings will be studied as models to illustrate methods of development and organization.

Prerequisite: A score of 32-45 on the CUNY Assessment Test in Writing (CATW)

ENG 092W

Developmental Writing II

3 cl hrs, 0 cr

An intermediate course in writing skills focusing on composing the short essay including revision and proofreading. Emphasis on instruction

in advanced and varied sentence patterns, appropriate punctuation and grammar and the use of the dictionary to investigate word formation and develop vocabulary. Short readings are used as models to illustrate methods of development and organization.

Prerequisite: A score of 46-55 on the CUNY Assessment Test in Writing (CATW) or a score of 40-45 if the student's reading score is 65 or higher or Satisfactory in ENG 090W without writing proficiency

ENG 092R.1 and ENG 092W.1 are combined Developmental Reading Level II and Developmental Writing II courses for students not proficient in both reading and writing. 6 cl hrs, 0 cr. *Prerequisite:* Eligibility for ENG 092W and ENG 092R

ENG 1101

English Composition I

Pathways: English Composition

4 cl hrs, 3 cr

A course in effective essay writing and basic research techniques including use of the library. Demanding readings assigned for classroom discussion and as a basis for essay writing.

Prerequisite: CUNY proficiency in reading and writing

ENG 1121

English Composition II

Pathways: English Composition

3 cl hrs, 3 cr

An advanced course in expository essay writing that requires a library paper. Further development of research and documentation skills (MLA style). Assigned literary and expository readings.

Prerequisite: ENG 1101

ENG 1133

Specialized Communications for Technology Students

3 cl hrs, 3 cr

Academic as well as occupational writing such as lab reports and bids, emphasis on the documented report, summarizing material and writing letters. Written presentations frequently utilize visual aids such as graphics, maps and charts.

Prerequisite: ENG 1101

ENG 1141

Creative Writing

Pathways: Creative Expression

3 cl hrs, 3 cr

Techniques and skills in writing poetry, drama, the short story and the essay. Emphasis on the student's awareness of creative potential.

Prerequisite: ENG 1101

ENG 1151

Introduction to Journalism

Pathways: Individual and Society

3 cl hrs, 3 cr

An introduction to the history and principles of journalism and to basic news writing and editing.

Prerequisite: ENG 1101

ENG 1161

Language and Thinking

Pathways: Individual and Society

3 cl hrs, 3 cr

A study of communication designed to increase understanding and control of language on both the individual and social levels. Class work includes reading and discussion of elements of semantics and psycholinguistics and guided practice in effective thinking.

Prerequisite: ENG 1101

ENG 1161ID

Language and Thinking

Pathways: Individual and Society

College Option: Interdisciplinary

3 cl hrs, 3 cr

A study of communication designed to increase understanding and control of language on both the individual and social levels. Class work includes reading and discussion of elements of semantics and psycholinguistics and guided practice in effective thinking.

Prerequisite: ENG 1101

ENG 1710

Introduction to Language and Technology

4 cl hrs, 4 cr

An introduction to the relationship between language and technology by reviewing the history of various technologies of the word, including writing, printing, and digital media. The course explores the history of rhetoric and its relationship to traditional, print-based technologies, as well as new forms and meanings of digital literacy.

Pre- or corequisite: ENG 1121

ENG 1773ID

Weird Science: Interpreting and Redefining Humanity

Pathways: Individual and Society

College Option: Interdisciplinary

3 cl hrs, 3 cr

This writing-intensive interdisciplinary course will allow students to explore the literature of shifting and expanding definitions of humanity and post-humanity from the perspectives of the natural and social sciences, technology and engineering, incorporating digital media.

Prerequisite: ENG 1101, CUNY proficiency in mathematics; students must also have a level of computer competency necessary for taking an online course.

ENG 2000

Perspectives in Literature

Pathways: Individual and Society

3 cl hrs, 3 cr

Readings in and writings about literature across genres, eras and locales. Themes include family, the individual and society, good and evil, gender, faith and "the human heart in conflict with itself."

Essays and exams based on readings.

Prerequisite: ENG 1101

ENG 2001

Introduction to Literature I Fiction

Pathways: Creative Expression

3 cl hrs, 3 cr

Analysis and critical understanding of selected fiction. Exams and essays based on readings.

Prerequisite: ENG 1101

ENG 2002

Introduction to Literature II Drama

Pathways: Creative Expression

3 cl hrs, 3 cr

Analysis and critical understanding of selected plays. Exams and essays based on readings.

Prerequisite: ENG 1101

ENG 2003

Introduction to Literature III Poetry

Pathways: Creative Expression

3 cl hrs, 3 cr

Analysis and critical understanding of selected English and American poems. Exams and essays based on readings.

Prerequisite: ENG 1101

ENG 2100

English Literature I

Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr (fall only)

The literature of England from Anglo-Saxon times through the 18th century. Exams and essays based on readings.

Prerequisite: ENG 1101

ENG 2101

English Literature II

Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr (spring only)

English literature from the beginning of the 19th century to the present. Exams and essays based on readings.

Prerequisite: ENG 1101

ENG 2150

Introduction to Women Writers

Pathways: Individual and Society

3 cl hrs, 3 cr

Introduction to the writings of selected women writers, both major

authors and less well-known women writers. A variety of genres including essays, fiction, poems and plays will be explored.

Prerequisite: ENG 1101

ENG 2160
Introduction to Women's Studies
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

This course focuses on literature, scholarly writing, and films that examine specifically the role(s) of girls and women, both nationally and internationally, and determines whether women themselves or others (external forces, individuals, or social systems) construct definitions of womanhood. The course utilizes texts, by both men and women, and addresses such themes as womanism, stereotypes, feminism, violence, politics, intimate/familial relationships, sex, sexuality, sexual orientation, and prescribed and evolving gender roles as they relate to girls and women.

Prerequisite: ENG 1101

ENG 2170
Introduction to Studies in Maleness and Manhood
Pathways: Creative Expression

3 cl hrs, 3 cr

This course identifies expected and redefined understandings and representations of Maleness and Manhood through physical, psychological, sociological, and philosophical approaches through literature, scholarly writing, and film. Subject matter includes sex, sexuality, sexual orientation, perception, identity, power, politics of manhood, violence, and the use or expectation of male dominance.

Prerequisite: ENG 1101

ENG 2170ID
Introduction to Studies in Maleness and Manhood
Pathways: Creative Expression
College Option: Interdisciplinary

3 cl hrs, 3 cr

This course identifies expected and redefined understandings and representations of Maleness and Manhood through physical, psychological, sociological, and philosophical approaches through literature, scholarly writing, and film. Subject matter includes sex, sexuality, sexual orientation, perception, identity, power, politics of manhood, violence, and the use or expectation of male dominance.

Prerequisite: ENG 1101

ENG 2180
Studies in Identity and Orientation

Pathways: US Experience in its Diversity
3 cl hrs, 3 cr

This course provides students with an introductory understanding of identity, focusing specifically on the concepts of gender and sexuality as they intersect with race, class, ethnicity, and other aspects of social location and identification. The course also includes an analysis of the appearance of gender and sexuality as integrated social concepts by reading and discussing contemporary American texts across multiple genres and media.

Prerequisite: ENG 1101

ENG 2190
Expressions of Identity: Representations of Gender and Space in Literature

Pathways: US Experience in its Diversity
3 cl hrs, 3 cr

This course focuses on space and place: personal, home/household, communal, virtual, digital, or global representations as they relate to self-perception and gender identity. Readings include works that explore the unique relationship between gender identity roles/expectations and the form and function of different types of place and space as being gender specific. Course also includes the study of environment, race, physical space, (C)lass, culture, gender roles, and sex and sexuality.

Prerequisite: ENG 1101

ENG 2200
American Literature I

Pathways: US Experience in its Diversity
3 cl hrs, 3 cr (fall only)

American writing from the Colonial beginnings to the middle of the 19th century, with emphasis on the literature as an expression of the cultural and intellectual life of the times. Exams and essays based on readings.

Prerequisite: ENG 1101

ENG 2201
American Literature II

Pathways: US Experience in its Diversity
3 cl hrs, 3 cr (spring only)

American writing from the late 19th through the 20th century, with emphasis on the literature as an expression of the cultural and intellectual life of the times. Exams and essays based on readings.

Prerequisite: ENG 1101

ENG 2250
Asian American Literature and Culture

Pathways: US Experience in its Diversity
3 cl hrs, 3 cr

This survey course introduces students to representative Asian American literary and cultural productions including fiction,

poetry, drama and autobiography by writers across generations. Diverse as these writers are in style and ethnicity, their works, depicting the Asian experience as immigrants and minorities in North America, echo each other. Course analyzes thematic and formal elements such as immigration, cultural assimilation, gender characterization, racial relocation and identity displacement in order to establish an intertextual and coherent understanding of this literary tradition.

Prerequisite: ENG 1101

ENG 2300
Great Works of Literature I
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr (fall only)

Representative readings, many in translation, from the great books of Western culture from ancient times to the Middle Ages and the Renaissance. Exams and essays based on readings.

Prerequisite: ENG 1101

ENG 2301
Great Works of Literature II
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr (spring only)

Representative readings, many in translation, from the great books of Western culture from the 18th century to the present. Exams and essays based on readings.

Prerequisite: ENG 1101

ENG 2400
Films from Literature
Pathways: Creative Expression

3 cl hrs, 3 cr

This course will allow students to examine the relationship between film and their literary sources. Through classroom discussions and out-of-class assignments, students will analyze classic and contemporary literary texts and their cinematic versions. Students will examine the relationship between film and literature, with specific focus on the techniques used in fiction, drama and film and the influences of censorship and society. Students will focus on the similarities and differences of literary works adapted into films.

Prerequisite: ENG 1101

ENG 2420
Science Fiction
Pathways: Individual and Society

3 cl hrs, 3 cr

Study of science fiction literature and film, with attention to cultural implications of the genre. Explores the questions science and technology raise about past, present and future societies. Projects, presentations and exams based on readings.

Prerequisite: ENG 1101

ENG 2420ID
Science Fiction
Pathways: Individual and Society
College Option: Interdisciplinary

3 cl hrs, 3 cr

Study of science fiction literature and film, with attention to cultural implications of the genre. Explores the questions science and technology raise about past, present and future societies. Projects, presentations and exams based on readings.

Prerequisite: ENG 1101

ENG 2570
Writing in the Workplace

3 cl hrs, 3 cr

A course in communications skills emphasizing writing used in business and industry, business letters, memoranda, minutes, process papers and reports.

Prerequisite: ENG 1121 or ENG 1133

Equivalent to old course ENG 3771

ENG 2575
Technical Writing

3 cl hrs, 3 cr

Students communicate technical and scientific information to a variety of audiences through written and oral presentations, using electronic media such as the Internet, Power Point and graphics programs. Students also analyze readings in science and technology, study technical writing models and practice collaborative research and presentation.

Prerequisite: ENG 1121

Equivalent to old course ENG 3773

ENG 2700
Introduction to Professional and Technical Writing

4 cl hrs, 4 cr

An introductory course in effective professional and technical writing techniques and concepts. Students use digital media to communicate professional and technical information to a variety of audiences via written and oral presentations. Students also analyze a wide range of documents, study appropriate models, and practice collaborative research, writing, and presentation.

Prerequisite: ENG 1121

ENG 2720
Writing with New Media

4 cl hrs, 4 cr

An exploration of the changing nature of composition practices and rhetorical strategies in the digital age. Students are introduced to a variety of digital writing platforms that expand communicative practices beyond print-based media. Taking advantage of the visual and interactive properties of computer-mediated communication, students consider the ways in which composition practices and rhetorical

strategies are transformed in digital environments.

Prerequisite: ENG 2700

ENG 2730 Professional Editing and Revising

4 cl hrs, 4 cr

Students learn to identify audiences and choose appropriate language, tone, and style in order to write, edit, and revise a variety of communiqués in various workplace scenarios. Revision documents may be internally created or externally appropriated, depending on the instructor's discretion. Instruction in the protocols of revising, editing, proofreading, and associated tasks. An emphasis on the ability to rethink and adapt to ever-present writing exigencies.

Pre- or corequisite: ENG 2700

ENG 3401 Law Through Literature

Pathways: Individual and Society

3 cl hrs, 3 cr

An exploration of concepts of justice, higher law, customary law and written law expressed through works of fiction and non-fiction. The course seeks to enhance the student's sensitivity to issues of ethics, gender bias and class consciousness as they affect the administration of justice. Readings improve communication skills and strengthen legal skills of identifying, articulating and locating problems in the context of underlying legal issues. Written assignments emphasize expository writing skills.

Prerequisite: ENG 1121

ENG 3402 Topics in Literature

Pathways: Individual and Society

3 cl hrs, 3 cr

Specific critical and thematic approaches to selected works in literature written in English. Selected works are studied in relation to a special theme, technique, theoretical issue, or cultural consideration. Possible topics: the geographical journey as a metaphor for maturation; stream of consciousness as a literary technique for heightening reality; the role of Shakespeare as a Tudor propagandist; the issue of how culture shapes identity, as depicted in diverse works of fiction.

Prerequisite: ENG 1121 or any 2000-level literature course (AFR, ENG, LATS)

ENG 3403 One Major Writer

Pathways: Individual and Society

3 cl hrs, 3 cr

The works of one English-language author are studied in the context of the author's life, career and historical

and cultural background, and may be considered from cross-cultural and cross-disciplinary perspectives. Authors studied may include such major figures as Austen, Baldwin, Crane, Dickinson, Faulkner, Henry James, Melville, Milton, Morrison, Shakespeare, Mark Twain, Walker, Whitman, Woolf.

Prerequisite: ENG 1121 or any 2000-level literature course (AFR, ENG, LATS)

ENG 3404 The Literature of Illness and Care

Pathways: Individual and Society

3 cl hrs, 3 cr

An in-depth study of the literature of illness and care through reading and writing about memoirs, fiction, essays and poetry.

Prerequisite: ENG 1121 or any 2000-level literature course (AFR, ENG, LATS)

ENG 3407 Gothic Literature and Visual Culture

Pathways: Creative Expression

3 cl hrs, 3 cr

Students critically read, analyze, and write about the popular genre of the Gothic. As represented in both literary and visual terms, in both Europe and the United States beginning in the late-18th century to today. Key concepts include horror, haunting, madness, and monsters.

Prerequisites: ENG 1121 or any 2000-level literature course (AFR, ENG, LATS)

ENG 3760 Digital Storytelling

4 cl hrs, 4 cr

The fundamental aspects of narrative in digital environments. Students learn to identify common elements of digital stories and analyze how story creators utilize digital tools, platforms, and interfaces to add interactivity to their narratives. Hands-on introductions to a range of freely available digital storytelling tools to create narratives in a variety of interactive formats.

Prerequisite: ENG 2720

ENG 3770 Advanced Professional Writing

4 cl hrs, 4 cr

Focusing on both print-based and digital presentations, this course prepares students for participation in contemporary writing fields. Emphasis is on document design and content execution in current publication media and a variety of industries including publishing, education, health care, and other industries. By exploring process, from writing to publication, students

become familiar with the demands of writing in the workplace.

Prerequisite: ENG 2700

ENG 3775 Advanced Technical Writing

4 cl hrs, 4 cr

With an emphasis on digital media platforms to communicate technical information to a variety of professional audiences, this advanced course focuses on effective technical writing applications in science, technology, engineering, and mathematics. Students analyze a wide range of technical deliverables, practice advanced online research methods, and develop both individual and collaborative writing projects and presentations.

Prerequisite: ENG 2700

ENG 3780 Planning and Testing User Documents

4 cl hrs, 4 cr

This course covers strategies for planning, conducting, and analyzing a usability test, as well as identifying and solving problems related to document design via research and practice usability testing. Using instructional design principles as part of documentation, teams perform tests and report results in a usability lab.

Pre- or corequisite: ENG 3775

ENG 3790 Information Architecture

4 cl hrs, 4 cr

This theory and practice-based course provides a theoretical overview of the concepts and practices of information architecture: organization, labeling, navigation, search, and metadata. Students develop practical skills through the study of human-computer interaction.

Prerequisite: ENG 2700

ENG 4700 Special Topics in Professional and Technical Writing

4 cl hrs, 4 cr

As an advanced course in theories and practices of communication for new media, the course explores relationships between communication theories and technologies from social, cultural, historical, and practical perspectives and the implications of these for communication projects in new media environments.

Prerequisites: ENG 1710, ENG 2720

ENG 4900 Professional and Technical Writing Internship

2 cl hrs, 120 field hrs, 4 cr

Students complete a 120-hour internship. In-class meetings provide an opportunity for presentations and electronic portfolio development

to enrich the learning experience. Students write weekly status reports. Supervision is by both the faculty and the job supervisor.

Prerequisite: Internship Coordinator approval and ENG 3780 or ENG 4700

LANGUAGE AND LINGUISTICS

LNG 1100 Language, Culture and Society

Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

An introduction to the study of language and linguistics. Students explore the diversity of world languages and develop an understanding of the genetic and geographical ties among them. They learn to appreciate language as an object of scientific study and to apply their new knowledge to everyday social interactions in their own lives and communities. They examine the relationship of linguistic variation to social and cultural identity. Topics include multilingualism, language learning and preservation, spelling reform, and language policy.

Prerequisite: CUNY reading proficiency. CUNY writing proficiency, or concurrent enrollment in ENG 092W, ESOL 021W, or ESOL 031W

ENGLISH for SPEAKERS of OTHER LANGUAGES

ESOL 011W Elementary Writing in College ESOL

6 cl hrs, 0 cr

Basic grammatical structures of English and composing skills necessary for effective written communication in an academic context using tasks of low-intermediate difficulty. Grammatical mechanisms and lexical choices, basic rhetorical strategies, editing and other writing conventions. Clear development and expression of an idea using fairly simple sentences. The fundamentals of crafting sentences, paragraphs and simple texts.

Prerequisite: A score of 32-45 on the CUNY Assessment Test in Writing (CATW); Corequisites: ESOL 012R, ESOL 1300, or department approval

ESOL 021W Intermediate Writing in College ESOL

6 cl hrs, 0 cr

Principles of effective communication through writing in an academic context, using tasks of high-intermediate to advanced difficulty. Discrete skills addressed include

grammatical and lexical mechanisms, rhetorical strategies and other writing conventions more advanced than those taught in ESOL 011W. The level of composition moves to more complex sentences and multi-paragraph texts.
Prerequisite: A score of 46-55 on the CUNY Assessment Test in Writing (CATW) or a score of 40-45 if the student has a reading score of 65 or higher, or Satisfactory in ESOL 011W without writing proficiency; *Corequisite:* ESOL 022R or department approval

ESOL 031W
Advanced Writing in College ESOL

3 cl hrs, 0 cr
For students who have attained the basic level of competency in grammar and writing skills required in ESOL 012W, but who need to develop and improve these linguistic skills. Writing tasks are of an academic nature and help students to move toward meeting University proficiency requirements as well as ENG 1101 entrance criteria.
Prerequisite: Satisfactory in ESOL 021W without writing proficiency

ESOL 012R
Elementary Reading in College ESOL

3 cl hrs, 0 cr
College-level academic reading and study skills through academic texts of low-intermediate to intermediate difficulty. Discrete skills include analysis of content, analysis of structure, vocabulary development, and study and test-taking skills. These objectives are pursued through a variety of activities involving both reading and writing, such as simple outlining and summarizing.
Prerequisite: A score of 32 or higher on the CUNY Assessment Test in Writing (CATW) and a score of 25-59 on the CUNY Assessment Test in Reading (ACT); *Corequisites:* ESOL 011W, ESOL 1300, or department approval

ESOL 022R
Intermediate Reading in College ESOL

3 cl hrs, 0 cr
College-level academic reading and study skills through academic texts of high-intermediate to advanced difficulty. Competencies addressed in ESOL 012R are pursued at a more advanced level. Discrete skills addressed include analysis of content, analysis of structure, vocabulary development, study and test-taking skills, recognizing stylistic devices and understanding texts in their historical, cultural and social contexts. These objectives are pursued through a variety of

activities that integrate reading and writing skills including advanced outlining and summarizing, and working with study guides.
Prerequisite: ESOL 012R or department approval or CUNY Assessment Test in Reading (ACT) score of 60-69; *Corequisite:* ESOL 021W or department approval or Satisfactory in ESOL 090W without writing proficiency

ESOL 032R
Advanced Reading in College ESOL

3 cl hrs, 0 cr
For students who have attained the level of competency and fluency in reading required in ESOL 022R, but who need to develop and improve this linguistic skill. Reading assignments are of an academic nature, emphasizing understanding of both content and structure, and helping students to move toward meeting University proficiency requirements as well as ENG 1101 entrance criteria.
Prerequisite: ESOL 022R

ESOL 1300
Oral Expression for English Language Learners

2 cl hrs, 2 lab hrs, 3 cr
This course is designed to enable students, especially those of non-English-speaking backgrounds, to express themselves clearly and efficiently in the oral mode, in academic and creative contexts. Emphasis is on phonetic tools, and the course includes lab time. This work is implemented through the use of recordings, individual and group drills in sound discrimination and production, dialogues, oral readings and recitations, group discussions, peer evaluation, and brief oral reports.
Prerequisites: A score of 32 or higher on the CUNY Assessment Test in Writing (CATW); and CUNY proficiency in reading or department approval. *Students who have earned credit for COM 1320 may not obtain degree credit for ESOL 1300*

Humanities

Ann Delilkan, Chair
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FACULTY:

Professors: Porter, Santore, Vey

Associate Professors: Cheng, Delilkan, Scannell

Assistant Professors: Granados, Lachheb, Lee, Lichterman, Qian,
Sanchez Jimenez, Standing, Swift, Zhu

Lecturer: McAuliffe

HUMANITIES

The Humanities Department maintains a unique position within our college of technology. The department offers courses in art history, communication, foreign language, music and theatre, providing students with laboratories for creative expression, cultural and historical understanding, and practical tool sets for work and living. These enriching competencies help students appreciate multiple perspectives and synthesize ideas, ultimately laying the groundwork for a sense of possibility and a clearer recognition of an individual's place in society.

Our courses complement the study of science, technology, engineering, mathematics and human services. The integration of the arts and communication studies into a general education curriculum produces demonstrably positive results in academic performance. By engaging with the humanities, students become more deeply invested in learning, cultivate a sensitivity to cultural diversity, think more critically and develop superior problem-solving and entrepreneurial skills.

Beyond the classroom, our courses prepare students for a diverse and fast-changing job market, where multilingualism, effective communications skills and advocacy of human and environmental concerns have become preeminent. The practice and appreciation of the visual and performing arts find concrete applications not only in the STEM disciplines but also in a range of real-world careers.

Humanities courses fulfill general education requirements and, in some cases, degree requirements as well.

COURSES:

FOREIGN LANGUAGES

ARB 1101 Elementary Arabic I Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

The course is designed for students who have had no previous background in Arabic. It focuses on four essential components: listening, speaking, reading and writing skills in Modern Standard Arabic.

Prerequisite: Department approval

ARB 1102 Elementary Arabic II Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

The course builds on and further expands students' developing skills in the four essential components of listening, speaking, reading and writing Modern Standard Arabic, through studying a range of intermediate-level texts which focus on Arabic culture, ideas and history.

Prerequisite: ARB 1101 or department approval

ARB 2201 Intermediate Arabic I Pathways: World Cultures and Global Issues

(fall only)

3 cl hrs, 3 cr

This course is designed for students who have taken Elementary Arabic II or have permission from the Humanities Department. Adopting the communicative approach in teaching Modern Standard Arabic (MSA), this course will continue to focus on the four essential language skills: listening, speaking, reading (both oral and comprehension) and

writing, and integrate cultural and social components with the language-learning experience. Through audio and video materials, students will be exposed to contemporary Arab society, literature and culture.

Pre- or corequisite: ARB 1102 or department approval

ARB 2202 Intermediate Arabic II

3 cl hrs, 3 cr

This course is designed for students who have taken Intermediate Arabic I or have permission from the Humanities Department. Through

the four essential language skills, listening, speaking, reading (both oral and comprehension) and writing in Modern Standard Arabic (MSA), this course will introduce students to more complex grammatical forms and structures, expand their knowledge of Arabic words, idiomatic expressions. Students will begin to learn the variation in register through the use of authentic texts (journalistic, poetic, Qur'anic), and also learn about Islam, literature, Arab history and the diverse cultures of the Arab world.
Pre- or corequisite: ARB 2201 or department approval

ASL 1101
American Sign Language I
3 cl hrs, 3 cr

American Sign Language I is a beginning course designed to develop skill in a form of manual communication used primarily by American-born deaf persons in interpersonal (face-to-face) relations. Emphasis will be placed on the use of the body for visually-based communications, and the structure, vocabulary and development of American Sign Language. An introduction to deaf culture is also provided.
Pre- or corequisite: CUNY proficiency in reading and writing

ASL 1102
American Sign Language II
(spring only)
3 cl hrs, 3 cr

ASL 1102 is a continuation of ASL 1101. The development of significantly more advanced language skills and more complex interactions with the deaf and hard of hearing is stressed. Emphasis will continue to be placed on the use of the face and body for visually based communication, and on the understanding of the structure and vocabulary of American Sign Language.
Prerequisite: ASL 1101 or department approval

CHN 1101
Elementary Chinese I
Pathways: World Cultures and Global Issues
3 cl hrs, 3 cr

This introductory course is designed for students with no or minimal proficiency in Chinese (non-heritage speakers). Mandarin Chinese, the official language spoken by the majority of the world's Chinese population, will be taught in Romanized form (pinyin). The emphasis is on speaking, listening comprehension and basic conversational skills. Students will also be exposed to the Chinese writing system and learn Chinese characters.
Prerequisite: Department approval

CHN 1102
Elementary Chinese II
Pathways: World Cultures and Global Issues
3 cl hrs, 3 cr

Concentrating on the expansion of vocabulary and grammar, the course aims at further upgrading students' Mandarin proficiency. Intensive practice in reading, pronunciation and listening will be emphasized. To reinforce students' comprehension of the language, aspects of the Chinese culture such as history, art, calligraphy and social custom will be incorporated into the lessons.
Prerequisite: CHN 1101 or department approval

CHN 2201
Intermediate Chinese I
Pathways: World Cultures and Global Issues
3 cl hrs, 3 cr

This is a continuing course for students who have acquired basic knowledge in Elementary Chinese (CHN 1102). Designed to further the development of language skills in listening, speaking, reading and writing, this course emphasizes students' Mandarin proficiency through comprehensive oral and written exercises (traditional characters). Social customs and cultural aspects of everyday situations are introduced.
Pre- or corequisite: CHN 1102 or department approval

CHN 2202
Intermediate Chinese II
3 cl hrs, 3 cr

This is a continuing course for students who have acquired basic knowledge in Intermediate Chinese I (CHN 2201). Designed to improve students' ability in listening, speaking, reading (traditional characters) and writing, this course focuses on achieving a higher level of proficiency in Mandarin with a particular emphasis on oral exercise and writing practice. Various cultural aspects including history, social customs and the arts will be incorporated into the class.
Pre- or corequisite: CHN 2201 or placement examination

FREN 1101
Elementary French I
Pathways: World Cultures and Global Issues
3 cl hrs, 3 cr

This is a course for beginning students focused on developing all language skills (listening/speaking/reading/writing). An appreciation of Francophone culture is integrated into each lesson. Students learn basic grammatical structures (simple sentence construction, conjugation of regular/irregular verbs) and

vocabulary of everyday life. Class activities are complemented by required online assignments.
Prerequisite: Department approval

FREN 1102
Elementary French II
Pathways: World Cultures and Global Issues
3 cl hrs, 3 cr

As a continuation of French I, students learn new grammatical structures (object pronouns, preterit and imperfect indicative) and increase vocabulary concerning everyday activities as they are gradually introduced to the cultural component of the language. Students build on their previous acquisition and strengthen their speaking, reading and writing skills. Class activities are complemented by required online assignments.
Prerequisite: FREN 1101 or department approval (placement test)

FREN 2201
Intermediate French I
Pathways: World Cultures and Global Issues
3 cl hrs, 3 cr

Students complete the acquisition of fundamental grammatical structures (indicative, imperative, subjunctive and conditional moods; simple and compound sentences), and increase their working vocabulary while they develop their communication skills. Students are also required to read a selection of texts that illustrate the diversity of Francophone culture. Class activities are complemented by required online assignments.
Prerequisite: FREN 1102 or department approval (placement test)

FREN 2202
Intermediate French II
3 cl hrs, 3 cr

Students build on the language structures and vocabulary acquired in previous semesters, developing proficiency in conversation, reading, and writing. Special attention is given to the Francophone world experience. Activities include reading and class discussion of selected texts. Conducted largely in French.
Prerequisite: FREN 2201 or department approval (placement test)

SPA 1101
Elementary Spanish I
Pathways: World Cultures and Global Issues
3 cl hrs, 3 cr

This is a beginning course focused on developing students' language skills (listening/speaking, reading/writing). An appreciation of Hispanic culture is integrated into each lesson. Students learn basic grammatical structures such as the present tense of regular

and irregular verbs, vocabulary used in everyday activities. Class activities are complemented by required online assignments.
Prerequisite: Department approval

SPA 1102
Elementary Spanish II
Pathways: World Cultures and Global Issues
3 cl hrs, 3 cr

Students learn new grammar structures (preterit and imperfect indicative) and more extensive vocabulary concerning everyday activities, and are gradually introduced to the cultural component of the language. Students build on their previous knowledge and strengthen their listening, speaking, reading and writing skills. Class activities are complemented by required online assignments.
Prerequisite: SPA 1101 or department approval (placement test)

SPA 2201
Intermediate Spanish I
Pathways: World Cultures and Global Issues
3 cl hrs, 3 cr

Students complete the acquisition of fundamental grammatical structures (indicative, imperative, subjunctive and conditional moods; simple and compound sentences) and increase their working vocabulary while they develop their communication skills. Students are also required to read a selection of texts that illustrate the diversity of Hispanic culture. Class activities are complemented by required online assignments. Students with credit for SPA 2201HS cannot register for SPA 2201.
Prerequisite: SPA 1102 or department approval (placement test)

SPA 2201HS
Spanish for Native/Heritage Speakers
Pathways: World Cultures and Global Issues
3 cl hrs, 3 cr

An intermediate course intended for students who were immersed in or exposed to the language while growing up, but who have received little or no formal instruction in Spanish. Strengthens students' competence in the oral and written standard varieties of Spanish by building on their previous knowledge to expand their vocabulary, strengthen their command of grammar, and achieve more confidence and fluency in speaking and writing while learning about the diversity of the Hispanic cultures. The skills acquired in this course will help reinforce students' bilingual abilities and cultural competence. Students

with credit for SPA 2201 cannot register for SPA 2201HS.
Prerequisite: Placement test and department approval (student must be a heritage speaker and demonstrate proficiency to place in SPA 2201HS))

SPA 2202
Intermediate Spanish II
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr
Students build on the language structures and vocabulary acquired in previous semesters and develop proficiency in conversation, reading, listening comprehension, and writing. Special attention is given to Hispanic world culture. Class activities include group dynamics, readings, and class discussion of selected texts. Conducted largely in Spanish.
Prerequisite: SPA 2201 or SPA 2201HS or placement test and department approval

SPA 2202P
Spanish for Health Professionals
3 cl hrs, 3 cr
Prepares individuals studying or working in healthcare related areas to communicate effectively when providing medical care and attention to Spanish-speaking patients in professional settings. In addition to basic language skills, students acquire new grammatical structures and learn health related vocabulary. Emphasis is placed specifically on patient-professional communication.
Prerequisite: SPA 1102 with department permission; or SPA 2201; or SPA 2201HS or higher; or placement test and department permission.

SPA 2203
Spanish for Health Professionals
3 cl hrs, 3 cr
Prepares individuals studying or working in healthcare related areas to communicate effectively when providing medical care and attention to Spanish-speaking patients in professional settings. In addition to basic language skills, students acquire new grammatical structures and learn health related vocabulary. Emphasis is placed specifically on patient-professional communication.
Prerequisite: SPA 1102 with department permission; or SPA 2201; or SPA 2201HS or higher; or placement test and department permission.

SPA 3301
Survey of Early Spanish Literature

Pathways: World Cultures and Global Issues
(spring only)
3 cl hrs, 3 cr
This course is intended for students with an advanced level of proficiency in Spanish. It covers a selection of works of Spanish literature (poetry, prose, drama) from the Middle-Ages to the end of the 18th century. Students are introduced to techniques of critical literary analysis. Class activities include group discussions, reading, and written assignments. Conducted in Spanish.
Prerequisite: SPA 2202 or department approval (placement test)

SPA 3302
Survey of Modern Spanish Literature

Pathways: World Cultures and Global Issues
(fall only)
3 cl hrs, 3 cr
This course is intended for students with an advanced level of proficiency in Spanish. It covers a selection of works of Spanish literature (poetry, prose, drama) from the beginning of the 19th century to the end of the 20th century. Students are introduced to techniques of critical literary analysis. Class activities include group discussions, reading, and written assignments. Conducted in Spanish.
Prerequisite: SPA 2202 or department approval (placement test)

ART HISTORY

ARTH 1100
History and Appreciation of Photography

Pathways: Creative Expression
3 cl hrs, 3 cr
An introduction to photography as a fine art and communications medium, from the publication of its invention in 1839 to the present, among Western practitioners. Illustrated lectures and discussions appraise diverse overlapping functions of photographs and view camera work within the history of art and culture. Changing styles, purposes and techniques are outlined chronologically.
Prerequisite: CUNY proficiency in reading and writing

ARTH 1101
History of Art: Prehistoric to Gothic
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr
Art from prehistoric time to the 14th century. Illustrated lectures and discussions (including architecture, sculpture and painting).
Prerequisite: CUNY proficiency in reading and writing

ARTH 1102
History of Art: Renaissance to Modern

Pathways: World Cultures and Global Issues
3 cl hrs, 3 cr
Art from the Renaissance to Impressionism. Illustrated lectures and discussions.
Prerequisite: CUNY proficiency in reading and writing

ARTH 1103
Survey of Art History
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr
An introduction to art and architecture from ancient Egypt to modern times. Classes sometimes meet at a New York City museum.
Prerequisite: CUNY proficiency in reading and writing

ARTH 1104
Art of the United States
Pathways: US Experience in its Diversity
3 cl hrs, 3 cr

A study of American artistic heritage, the artistic personalities and national characteristics that have shaped this legacy, from Native American, European and colonial origins to the present including Asian, African and Latin American influences.
Prerequisite: CUNY proficiency in reading and writing

ARTH 1106
Modern Art
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr
Impressionism, Post-Impressionism, Fauvism, Expressionism, Cubism, Futurism, Non-Objective Art, Dadaism, Surrealism, Abstract Expressionism, Pop, Op, Minimalism, Color Field Kinetics, Conceptual and Artificial Realism.
Prerequisite: CUNY proficiency in reading and writing

ARTH 1108
Art of Asia
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr
Architecture, sculpture, painting and the minor arts of India, China, southeast Asia, Indonesia, Korea and Japan. Slide lectures, discussion and museum trips.
Prerequisite: CUNY proficiency in reading and writing

ARTH 1110
Islamic Art
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr
A historical survey of the art and architecture of the Islamic world from the 7th to the 17th century. Covers both Eastern and Western Islamic regions.

Prerequisite: CUNY proficiency in reading and writing

ARTH 1112
Introduction to Film
Pathways: Creative Expression

3 cl hrs, 3 cr
An introduction to the history of film from its beginnings in the late nineteenth century to the present. Through illustrated lectures, selected screenings, and discussion, students develop a historical appreciation of film genres including narrative, documentary, and experimental, and of the legacy of major filmmakers. Changing styles and techniques are outlined chronologically to examine the relationship between film and the visual arts.
Prerequisites: CUNY proficiency in reading and writing

ARTH 1204/HIS 1204
20th Century Dress and Culture

3 cl hrs, 3 cr
A survey of fashion history, from the end of the 19th century to the present. It offers an overview of the many influences that have affected the development of clothing. Studies the effect of an historical period on the clothing of the time through analysis of its economics, politics, religion and culture. Issues affecting the industry are explored through readings, videos, discussions and links to local industry are made through field trips and guest speakers.
Prerequisite: ENG 1101

ARTH 2101D
Healing the Body: The Visual Culture of Medicine

Pathways: Individual and Society
College Option: Interdisciplinary
3 cl hrs, 3 cr
Examines the visual culture of medicine, including how images help shape medical knowledge, artistic representations of the healthy and ailing body, and the emergence and increasing dependence on visual technologies. The lecture course consists of three modules that present the socio-historical context of medicine in relation to the body, disease and illness, and treatment and healing. Students acquire skills to better analyze images, and examine variables in cultural values that underlie medical practice across history.
Prerequisite: ENG 1101

ARTH 2321/ARCH 2321
History of Architecture: 1900 to the Present
Pathways: Creative Expression

3 cl hrs, 3 cr
A comprehensive study of modern architectural movements from the 1900's to present day. Architects and their buildings will be explored

in relationship to their cultural, artistic, philosophical, historical and technological contexts.

Prerequisites: ENG 1101; and one of the following ARTH 1101 or ARTH 1102 or ARTH 1103 or ARCH 1104 or ARCH 1121

ARTH 3311 The History of Graphic Design

Pathways: Creative Expression

3 cl hrs, 3 cr

The major designers, and the aesthetic and technical developments in print media from antiquity to the present, are studied in their cultural and artistic contexts. Renaissance to modern practices are extensively examined.

Prerequisite: ENG 1121

ARTH 3401 Italian Renaissance Art and Architecture **Pathways: World Cultures and Global Issues**

3 cl hrs, 3 cr

The major monuments of Renaissance painting, sculpture and architecture (1300-1580) are studied in their historical and cultural context. The work of Giotto, Donatello, Brunelleschi, Leonardo, Michelangelo, Raphael and Titian is emphasized.

Prerequisites: ENG 1101 and one of the following: ARTH 1101, ARTH 1102, ARTH 1103 or ARCH 1121

LATIN AMERICAN STUDIES

(In accordance with the name change in Spring 2016, PRS courses are now LATS)

LATS 1461 Latin American History **Pathways: World Cultures and Global Issues**

3 cl hrs, 3 cr

A study of Latin America with emphasis on the development of institutionalized political processes. Particular attention is paid to Argentina, Brazil, Chile, Mexico and Cuba. Centered around such issues as the Spanish political colonial heritage, the modern quest for legitimacy and stability in government, economic dependency, dictatorship, militarism and nationalism. Emphasis is also placed on domestic issues and on foreign policy, particularly as they affect inter-American relations.

Prerequisite: CUNY proficiency in reading and writing

Equivalent to old course PRS 1461

LATS 1462 History of Puerto Rico

3 cl hrs, 3 cr

The historical forces shaping the development of Puerto Rico to the 20th

century. The pre-Columbian period, the discovery, the Spanish conquest and colonization. Indian and European influences and contributions are examined as well as the impact of the United States as successor to Spain in Puerto Rico's 20th century development. Contemporary politics and government of Puerto Rico including the statehood, commonwealth, independence issues are also reviewed.

Prerequisite: CUNY proficiency in reading and writing

Equivalent to old course PRS 1462

LATS 2202 Latin American Literature **Pathways: World Cultures and Global Issues**

3 cl hrs, 3 cr

Literature of Latin America from 15th to 20th centuries. Special attention is given to 19th and 20th century authors.

Prerequisite: ENG 1101

Equivalent to old course PRS 2202

LATS 2211 Puerto Rican Literature **Pathways: World Cultures and Global Issues**

3 cl hrs, 3 cr

Puerto Rican identity expressed in the various forms of Puerto Rican literature. Provides experience in the use and analysis of the Spanish language in its various stylistic manifestations as expressed in the literature of Puerto Rico. Offered in English.

Prerequisite: ENG 1101

Equivalent to old course PRS 2211

LATS 2501 The Puerto Rican and Latin American in New York and Urban America

**Pathways: US Experience in its
Diversity**

3 cl hrs, 3 cr

An overview of Latinos and Latin American culture, and their significant impact in American society; factors of migration to the United States; demographic characteristics; pattern of family life and other secondary institutions; marginality and biculturalism; New York City Latinos as they relate to established institutions (schools, hospitals, economic activities, system of justice, etc.); bilingualism; Latino identity; Latinos' contribution to the formation of the cultural diversity of the United States.

Prerequisite: SOC 1101

MUSIC

MUS 1201 Musical Concepts: A Guide to Listening

3 cl hrs, 3 cr

Provides a basic understanding of the creative musical process and develops

and enhances listening awareness, sensitivity and perception.

Prerequisite: CUNY proficiency in reading and writing

MUS 1202 Fundamentals of Musicianship

3 cl hrs, 3 cr

An applied course dealing concretely with such musical elements as notation, metric patterns, rhythmic designs, intervals, melody, tonality, etc., with intensive training and drill in rhythmic, intervallic and melodic dictation, sight singing and ear training.

Prerequisite: CUNY proficiency in reading and writing

MUS 1210 Musical Styles

Pathways: Creative Expression

3 cl hrs, 3 cr

Major musical contributions to Western civilization including symphonic, choral, chamber and operatic compositions.

Prerequisite: CUNY proficiency in reading and writing

MUS 1211 Music of Latin America **Pathways: Creative Expression**

3 cl hrs, 3 cr

A study of the music of Latin America including African, Native American and European cultural influences. Melodic patterns, rhythms and harmonic structures of the music, as well as the influence of social settings and religious rituals are examined and discussed.

Prerequisite: CUNY proficiency in reading and writing

MUS 1212 Introduction to World Music **Pathways: World Cultures and Global Issues**

3 cl hrs, 3 cr

Introduction to World Music surveys music from the Middle East, China, Africa, Eastern Europe, South America, India, Japan, and Korea, including traditional, classical, folk and popular styles. Musical terms such as rhythm, melody, harmony, pitch, and meter form the basis for the exploration, comparison and study of different international styles.

Pre- or corequisite: ENG 1101

MUS 2206 Jazz **Pathways: Creative Expression**

3 cl hrs, 3 cr

Jazz as it relates to the development of folk art and its influence on contemporary composition. The cultural and social climate and

conditions which shaped the emergence of jazz as an art form from its earliest beginnings to the advanced stages found today are considered. Aesthetic considerations and critiques of all art forms are discussed with reference to their application to the field of jazz.

Prerequisite: ENG 1101

MUS 2207 Twentieth Century Music **Pathways: Creative Expression**

3 cl hrs, 3 cr

Innovations in music since the turn of the century. The contributions of Debussy, Bartok, Stravinsky, Schoenberg, Webern, Varese and others are reviewed and discussed. The traditional musical landmarks of the past are studied in terms of recent aesthetic considerations. The structural foundations which served the 17th, 18th and 19th centuries are considered in terms of how contemporary composers have altered and reshaped them. The avant-garde ideas of musique concrete, electronic and aleatoric music are treated in depth.

Prerequisite: ENG 1101

PERFORMING ARTS

PERF 1130 Music Workshop: Piano I

1 cl hr, 2 lab hrs, 2 cr

An applied course for students without previous background in music who want to learn the fundamentals of playing the piano. Students are taught musical notation and basic technique that enable them to play simple melodies and accompaniments in folk, popular and classical styles. Music theory includes major and minor scales, keys and chords used in harmonizing simple melodies and elementary improvisation. The ultimate goal of the workshop is informal solo, duet and ensemble performance by students.

Prerequisite: None

PERF 1132 Music Workshop: Guitar

1 cl hr, 2 lab hrs, 2 cr

Basic music theory and its application in performance on the guitar. Musical notation, key signatures, time signatures and meters for playing simple melodies in the folk, rock, popular and classical styles. Chord construction, strumming techniques and simple finger-picking skills, basic improvisation and ensemble playing.

Prerequisite: None

COMMUNICATION

COM 1320 Voice and Diction

3 cl hrs, 3 cr

Investigation of speech patterns and dialects as they relate to ethnicity, regionalism, and immigration in the U.S. The relative social value of Standard and non-Standard American English dialects are considered. The course introduces students to the physiological mechanism of speech production and corresponding phonetic notation. Students work on vocal production (volume, rate, pitch, phrasing) and are provided with the tools to analyze, and then target, the sounds of Standard American English. *Prerequisites: CUNY proficiency in reading and speech placement test for non-native speakers. Students who have earned credit for ESOL 1300 may not obtain degree credit for COM 1320. This course does not count for liberal arts and sciences credit toward a degree but is of value to those seeking to make their speech patterns clearer to speakers of American English.*

COM 1330 Public Speaking

Pathways: Individual and Society

3 cl hrs, 3 cr

Fundamental principles of speaking in public situations and the preparation and delivery of informative and persuasive presentations. Subjects include ethics in public speaking, audience analysis, selecting and researching speech topics, constructing well-reasoned arguments, extemporaneous delivery, and peer evaluation. Students are expected to develop outlines and speaking notes, use visual aids, and improve on verbal and nonverbal delivery skills.

Prerequisite: CUNY proficiency in reading and writing

COM 1332 Introduction to Human Communication

3 cl hrs, 3 cr

A foundational communication course providing students with important knowledge of, and training in, different forms of human communication across varying sociocultural contexts and case scenarios. This course covers the following topics: history of human communication and mediated, health, group, and public communication. *Prerequisite: CUNY proficiency in reading and writing*

COM 1335 Group Communication

Pathways: Individual and Society

3 cl hrs, 3 cr

Small group decision-making. Reviews research on communication in small groups, focuses on argumentation,

leadership, group roles and norms as they affect critical thinking, communication, and being goal oriented in groups.

Prerequisite: CUNY proficiency in reading and writing

COM 1340 Oral Interpretation of Literature

Pathways: Creative Expression

3 cl hrs, 3 cr

Analyzing and interpreting literature within the distinct dimension of speech discourse. Students identify rhetorical and lyrical structures, allusions, narratives, and potential ambiguities in order to articulate an intention and learn how meanings can be enhanced or altered through delivery techniques. Materials drawn from classical and modern poetry, prose, and dramatic literature.

Prerequisite: CUNY proficiency in reading and writing

COM 2401 International Communication

Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

This class examines the role of communication in international relations. Topics include a number of key nation-to-nation concerns: the flow of news and information, media systems, power, war, trade, economics, the role of multinational bodies, technology, and issues such as, terrorism, human rights, social justice, and the preservation of peace. This course examines the people, groups, and organizations that are involved in international relations, paying close attention to social, cultural, historical and contemporary perspectives, events, and theoretical approaches

Prerequisite: ENG 1101

COM 2402 Intercultural Communication

Pathways: Individual and Society

3 cl hrs, 3 cr

This course explores intercultural communication theory and research within social, organizational, and interpersonal contexts. Topics include similarities and differences in values, language, perceptions of time and space, social systems, interethnic and inter-group communication, identity, and adaptation. Students will take part in class discussions, activities, reading, written assignments, field research, and oral presentations.

Prerequisite: ENG 1101

COM 2403 Health Communication

Pathways: Individual and Society

3 cl hrs, 3 cr

The study and practice of communication as it relates to health professionals and patient outcomes. Topics include provider-patient interaction, team

communication and the diffusion of health information through public health campaigns. Students learn the basics of clear, purposeful and compassionate communication across multiple channels, to reduce errors and provide better health care delivery.

Prerequisite: COM 1330

COM 2404 Interpersonal Communication

Pathways: Individual and Society

3 cl hrs, 3 cr

A communication course providing students with important knowledge of, and training in, communication between individuals across varying sociocultural contexts and case scenarios. This course covers the following topics: verbal and nonverbal communication, cross-cultural and familial communication, cyberspace communication, and organizational communication.

Prerequisite: COM 1330

COM 3401 Business and Professional Communication

Pathways: Individual and Society

3 cl hrs, 3 cr

Principles of communication within organizations. Topics and activities may include organizational communication and communication theory, group problem solving, case studies, interviewing, and formal presentations.

Prerequisites: ENG 1121 or higher; or department approval or COM 1330 or higher

THEATRE

THE 1180 Development through Drama

3 cl hr, 3 cr

Examines the creative process that begins with written analysis of a script and includes learned skills required to convey character on paper and on stage. Techniques are developed through self exploration and heightened awareness of senses and emotions. Culminates with a classroom performance of fully developed characters. Attendance at theatre performances on and off campus. Use of character-building techniques in writing and performing to increase self-awareness and learn the role of deliberate intention in creating art and in building a successful life.

Prerequisite: ENG 1101 or COM 1330

THE 2180 Introduction to the Theatre

Pathways: Creative Expression

3 cl hrs, 3 cr

Principles and practices involved in staging plays leading to an

appreciation and understanding of the theatre as an art form. Emphasis on the major aspects of theatre production: text, direction, acting and technical areas such as stage design and lighting. The course includes demonstrations as well as visits to theatres in the area. Students are responsible for fees for plays.

Prerequisite: ENG 1101

THE 2280 History of the Theatre: Stages and Technology

Pathways: Creative Expression

3 cl hrs, 3 cr

A survey of the development of architectural and scenic styles in the physical structure of theatre from its beginnings in ancient Greece to its most current forms. Emphasis placed on the stylistic influences of theoreticians and artistic movements.

Prerequisite: ENG 1101

THE 2280ID History of the Theatre: Stages and Technology

Pathways: Creative Expression

College Option: Interdisciplinary

3 cl hrs, 3 cr

A survey of the development of architectural and scenic styles in the physical structure of theatre from its beginnings in ancient Greece to its most current forms. Emphasis placed on the stylistic influences of theoreticians and artistic movements.

Prerequisite: ENG 1101

THE 2380 Play Analysis: Texts and Contexts

Pathways: Creative Expression

3 cl hrs, 3 cr

The analysis of play scripts for literary structure, aesthetic elements necessary for their effective theatrical realization, and an appreciation of stylistic approaches to plays from various historical and theatrical genres.

Prerequisite: ENG 1101

THE 3280 American Musical Theatre

3 cl hrs, 3 cr

A survey of American musical theatre on stage and screen including its origins, elements and structure, significant productions and creators, and current status, considered in the context of a changing America. Live productions may be attended when available.

Prerequisite: ENG 2002 or any THE course or (ENG 1101 and AFR 1321)

Interdisciplinary Courses

All baccalaureate students are required to complete one interdisciplinary liberal arts and sciences course.

Interdisciplinary study focuses on questions, problems, and topics too complex or too broad for a single discipline or field to encompass adequately; such studies thrive on drawing connections between seemingly exclusive domains. To be considered an interdisciplinary course at City Tech, the course must be team-taught by more than one faculty member from two or more departments in the College (exceptions are made for departments that provide a home for multiple disciplines, such as Humanities and Social Science).

COURSES:

AFR 2402ID

The Heritage of Imperialism

College Option: Interdisciplinary
3 cl hrs, 3 cr

An examination of the thought, structure, operation and results of imperialism in human history generally, and the 19th/20th centuries in particular. European/American imperialism in the non-white areas of the world: the role of the Industrial Revolution; the imposition of Western European institutions on indigenous peoples of Africa, Asia, North/South America; colonialism; attempts by these people to reestablish autonomous sociological and cultural systems. *Prerequisite: ENG 1101 and any previous AFR course*

AFR 3000ID

Black New York

Pathways: US Experience in Its Diversity

College Option: Interdisciplinary
3 cl hrs, 3 cr

Using history, literature, the arts, politics, and sociology, this interdisciplinary course seeks to trace the African presence in New York from the 1600s to the present. This localized course will enable students to examine the varied ways in which people of African descent in the Diaspora have helped to shape the complex identity of New York City over time. Readings, films, music, information literacy sources, and local cultural and research institutions will be used to examine topics, such as slavery, resistance, migration, immigration, labor, Civil Rights, popular culture, gender politics, and gentrification. Sites of inquiry in the five boroughs may include, but are not limited to, the African Burial Ground, San Juan Hill, and Harlem in Manhattan, Sandy Ground in Staten Island, Weeksville, Bedford-Stuyvesant, Crown Heights, and Flatbush in Brooklyn, the South Bronx, and Addisleigh Park in Queens. *Prerequisite: ENG 1101 and any AFR course*

ARTH 2101ID

Healing the Body: The Visual Culture of Medicine

Pathways: Individual and Society
College Option: Interdisciplinary
3 cl hrs, 3 cr

Examines the visual culture of medicine, including how images help shape medical knowledge, artistic representations of the healthy and ailing body, and the emergence and increasing dependence on visual technologies. The lecture course consists of three modules that present the socio-historical context of medicine in relation to the body, disease and illness, and treatment and healing. Students acquire skills to better analyze images, and examine variables in cultural values that underlie medical practice across history. *Prerequisite: ENG 1101*

CST 1102ID

Programming Narratives: Computer Animated Storytelling

College Option: Interdisciplinary
3 cl hrs, 3 cr

In this interdisciplinary course, through the study of the structure of narrative, concepts of problem solving, and the logic of computer programming languages, students develop a narrative-driven video game prototype. Emphasis is placed on creative writing and computational thinking. CST 1102 is intended for non-CST majors. Credits for this class will not count toward a BTech in Computer Systems *Prerequisites: ENG 1101 and CUNY proficiency in mathematics*

ECON 2505ID

Environmental Economics

Pathways: World Cultures and Global Issues

College Option: Interdisciplinary
3 cl hrs, 3 cr

This course examines current environmental issues from a macroeconomic perspective, focusing on both the long- and short-term economic viability of

various proposals to address current environmental challenges. Traditional goals of economic efficiency are examined in the context of the need to expand renewable energy sources, green design, sustainable construction and resource allocation and other efforts to combat climate change on a global scale.

Prerequisite: ECON 1101 or ECON 1401

ECON 2820ID

Behavioral Economics

College Option: Interdisciplinary
3 cl hrs, 3 cr

This interdisciplinary course examines the factors that underlie the judgment/decision making processes of economic agents. Behavioral economics challenges the rationality assumption of standard economic theory and encompasses the role of emotion, psychological biases and heuristics to understand non-rational decision making. *Prerequisites: (ECON 1101 or ECON 1401); MAT 1275 or higher; PSY 1101*

ENG 1161ID

Language and Thinking

Pathways: Individual and Society
College Option: Interdisciplinary
3 cl hrs, 3 cr

A study of communication designed to increase understanding and control of language on both the individual and social levels. Class work includes reading and discussion of elements of semantics and psycholinguistics and guided practice in effective thinking. *Prerequisite: ENG 1101*

ENG 1773ID

Weird Science: Interpreting and Redefining Humanity

Pathways: Individual and Society
College Option: Interdisciplinary
3 cl hrs, 3 cr

This writing-intensive interdisciplinary course will allow students to explore the literature of shifting and expanding definitions of humanity and post-humanity from the perspectives of the natural and social sciences, technology and engineering,

incorporating digital media.

Prerequisite: ENG 1101, CUNY proficiency in mathematics; students must also have a level of computer competency necessary for taking an online course.

ESCI 2000ID

Energy Resources

College Option: Interdisciplinary
3 cl hrs, 3 cr

This special topics interdisciplinary course surveys various energy resources: hydropower, solar, wind, geothermal and natural gas. Students learn about the scientific process of energy production and its applications. Students explore economic, social, political, and environmental impacts. *Prerequisites: ENG 1101, MAT 1275 or higher*

ENG 2170ID

Introduction to Studies in Maleness and Manhood

Pathways: Creative Expression
College option: Interdisciplinary
3 cl hrs, 3 cr

This course identifies expected and redefined understandings and representations of Maleness and Manhood through physical, psychological, sociological, and philosophical approaches through literature, scholarly writing, and film. Subject matter includes sex, sexuality, sexual orientation, perception, identity, power, politics of manhood, violence, and the use or expectation of male dominance. *Prerequisite: ENG 1101*

ENG 2420ID

Science Fiction

Pathways: Individual and Society
College Option: Interdisciplinary
3 cl hrs, 3 cr

Study of science fiction literature and film, with attention to cultural implications of the genre. Explores the questions science and technology raise about past, present and future societies. Projects, presentations and exams based on readings. *Prerequisite: ENG 1101*

HEA 2112ID**The Evolving Face of Race, Class and Gender Identity****College Option: Interdisciplinary***3 cl hrs, 3 cr*

Using internal colonialism as an analytical construct, this course examines the socio-historical, cultural conditions, and gender constructs of marginalized cultural and racial groups in America. A special focus is on Blacks and other Indigenous cultures and populations, such as Native Americans and Mexican Americans. Topics include, but are not limited to, the following: slavery/genocide, racial/cultural blending, integration/segregation, economic deprivation, the impact of public health and mental health and shifts in gender identity and cultural roles.

*Prerequisite: ENG 1101***HIS 3402ID****Topics in Modern World History, 1945-Present****Pathways: World Cultures and Global Issues****College Option: Interdisciplinary***3 cl hrs, 3 cr*

A seminar-based exploration of selected topics in modern world history from 1945 to the present. Students in this course are expected to keep abreast of current trends in various parts of the world and to be familiar with popular sources of information. The topic for each section will be selected by the instructor.

Prerequisite: ENG 1101 and a previous history CORE course (which includes HIS 1000 series or AFR 1460 or AFR 1461 or AFR 1465 or AFR 1466 or LATS 1462)

LIB 2205ID/ARCH 2205ID**Learning Places: Understanding the City****College Option: Interdisciplinary***1 cl hr, 4 lab hrs. 3 cr*

This special topics course offers an interdisciplinary approach to investigating our built environment using a case study focused on a specific place each semester. This course combines physical examination with information research and data collection using methodologies developed in multiple disciplines. Students from a variety of departments engage in on-site exploration and in-depth research of a location in New York City.

*Prerequisite: ENG 1101***PHIL 2203ID****Health Care Ethics****Pathways: Individual and Society****College Option: Interdisciplinary***3 cl hrs, 3 cr*

An examination of the major ethical theories on what is morally right and wrong, and the meaning of

moral concepts (e.g., the concepts of right and duty). Focus is on ethical problems associated with the practice of medicine and biomedical research. (Available to health science students as an alternative to PHIL 2103).

*Prerequisite: ENG 1101***PHYS 1002ID****Introduction to the Physics of Natural Disasters****College Option: Interdisciplinary***3 cl hrs, 1 lab hr, 3 cr*

A course for non-science majors that focuses on natural disasters and the dynamic Earth processes that control them. It integrates the principles of geology, meteorology, climatology, oceanography, and astronomy to provide rudimentary understanding of geophysics. Students learn about the nature, causes, risks, impacts, and prediction of natural disasters including hurricanes, earthquakes, volcanoes, tsunamis, and climate change. Laboratory exercises are incorporated with class work to illustrate and supplement the lecture material.

Pre- or corequisite: MAT 1180 or MAT 1190 or higher

PHYS 1010ID**Science in the Kitchen****College Option: Interdisciplinary***3 cl hrs, 1 lab hr, 3 cr*

An introduction to the scientific concepts behind food cooking processes. Emphasis is given to general concepts and qualitative description. Laboratory work complements the course to show the scientific concepts in action in the kitchen. Laboratory exercises explain the scientific method and teach students how to perform experiments and compose a lab report.

*Prerequisite: MAT 1190 or higher***PSY 2404ID****Personnel and Organizational Psychology****Pathways: Individual and Society****College Option: Interdisciplinary***3 cl hrs, 3 cr*

Theory and techniques of personnel problems in industry and business. Dynamics of individual and group behavior in work situations, selection, evaluation methods, interviewing and leadership development. The psychological implications of mechanization and automation are considered.

*Prerequisite: PSY 1101***PSY 3405ID****Health Psychology****Pathways: Individual and Society****College Option: Interdisciplinary***3 cl hrs, 3 cr*

An overview of existing psychological and epidemiological findings on the relationship between behavior and disease. The course explores how behavior, emotion and cognition can influence disease processes and examines the impact of stress and personal control on specific coronary, immune and infectious disease symptoms. Social support, referral and interventions for optimal physical and mental health are introduced.

*Prerequisite: PSY 1101, ENG 1101***SOC 3302ID****Environmental Sociology****Pathways: Individual and Society****College Option: Interdisciplinary***3 cl hrs, 3 cr*

This course examines the complex interactions between societies and the natural environments on which they depend. Special emphasis is placed on the link between the deepening ecological crisis and the operation of the capitalist socio-economic system.

Prerequisites: ENG 1101 and any SOC or ANTH course

SBS 2000ID**Research Methods for the Social and Behavioral Sciences****College Option: Interdisciplinary***3 cl hrs, 3 cr*

An introduction to the research methodologies utilized in the social and behavioral sciences, beginning with the fundamentals of research design, through data collection, analysis, interpretation, and the final reporting of results. Both quantitative and qualitative designs are examined using software to aid in inquiry and analysis.

Prerequisite: Any introductory ANTH, ECON, GEOG, GOV, HIS, PSY, SOC, or, any AFR or LATS 1400 series course, or AFR 1501, 1502, 2402 or 3000, or COMM 2402, or 3401 and MAT 1180 or higher; COMD students will also need the prerequisite of PSY 3407

THE 2280ID**History of the Theatre: Stages and Technology****Pathways: Creative Expression****College Option: Interdisciplinary***3 cl hrs, 3 cr*

A survey of the development of architectural and scenic styles in the physical structure of theatre from its beginnings in ancient Greece to its most current forms. Emphasis placed on the stylistic influences of theoreticians and artistic movements.

Prerequisite: ENG 1101

Liberal Arts and Sciences Programs

Pearl Building, room P 616
718.260.5082 / 718.260.5014

Dean's office: 718.260.5008
email: jvazquez-poritz@citytech.cuny.edu

PROGRAMS:

Liberal Arts/AA
Liberal Arts and Sciences/AS

Associate in Arts in LIBERAL ARTS (LAA)

The associate in arts degree program is a comprehensive liberal arts curriculum providing a solid academic foundation that prepares the graduating student for transfer to a bachelor's degree program and for the professional world. Students enrolled in the associate in arts degree program have an opportunity to prepare for further study in fields such as law, public relations, journalism, broadcasting, education, political science, government, history, psychology, communication and languages. The capstone course (options are listed in the table at the end of this section) serves as a culminating academic experience requiring the use and integration of oral and written communication, critical thinking and analysis.

A maximum of six elective credits required for the degree in Liberal Arts (LAA) may be chosen from courses offered by the Schools of Technology and Design or Professional Studies, with permission from the Dean of Arts and Sciences, the Namm Building, room N 321, at 718.260.5008, and the Program Director of Liberal Arts, the Pearl Building, room P 616, at 718.260.5082.

Learning Outcomes

- Effective oral and written communication skills
- Team work and problem solving skills
- Foundations in computer and information literacy, with critical thinking skills, for lifelong learning
- Improved ability to communicate in a foreign language and fundamental knowledge of the culture of native speakers
- Fundamental knowledge of history
- Fundamental knowledge of the behavioral and social sciences
- Fundamental knowledge of philosophy
- Fundamental knowledge of the humanities
- Fundamental knowledge of literature
- Fundamental knowledge of a physical or biological science
- Fundamental quantitative literacy through the study of mathematics

Academic Advisement

Academic advisement for first semester students takes place in the New Student Center, located in the Namm Building, room N 104. All other students receive advisement through the Office of Liberal Arts, located in the Pearl Building, room P 616. Students are strongly urged to consult with an academic advisor before registering for classes.

Pathways to Baccalaureate Programs

Graduating LAA students can readily transfer into most baccalaureate degree programs. Transfer of 60 credits to all colleges within The City University of New York system is assured for graduates of City Tech's associate in arts degree program. For information on transfer into City Tech's programs in human services, career and technology teacher education, or facilities management, after earning the LAA degree, contact the appropriate department, or go to <http://www.citytech.cuny.edu/academics/deptsites/liberalartsandsciences/laa.pdf>

Performance and Academic Standards

- Students must complete ENG 1101 with a "C" or better to graduate.
- Prior to enrolling for the first time in a foreign language, students must meet with a foreign language advisor in the Humanities Department, Atrium Building, room A 630, for placement. Placement is determined by a brief placement examination. Students who begin a foreign language with a course number of FL 2202 (SPA 2202, FREN 2202, etc.) or higher need only complete 6 credits of foreign language (two courses FL 2202, FL 3301 or FL 3302). The remaining 3 foreign language credits normally needed for graduation become electives.
- Students must complete one of the following to fulfill their mathematics requirement: MAT 1190, MAT 1275, MAT 1375, MAT 1475, MAT 1575 or MAT 2675. MAT 1175, Fundamentals of mathematics may be taken for elective credit.

Option in African American Studies

An option in African American Studies is available. For details, please refer to the African American Studies Department catalog description.

Articulation Agreements

To learn more about City Tech's articulation agreements to the CUNY BA in the areas of African American Studies and Gender and Sexuality Studies, see <http://www.citytech.cuny.edu/academics/articulations.aspx>

Degree Requirements

The College will grant an associate in arts degree (AA) upon satisfactory completion of the required 60 credits as indicated:

GENERAL EDUCATION COMMON CORE

30-35 CREDITS

I – REQUIRED CORE (4 COURSES, 12-15 CREDITS)

English (2 courses, 6 credits)

ENG 1101	English Composition I ¹	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 3-4 credits)

MAT 1190	Quantitative Reasoning or higher ²
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Life and Physical Sciences (1 course, 3-5 credits)

Any approved course ²

II – FLEXIBLE CORE (6 COURSES, 18-20 CREDITS)

Select one course from each of the following areas plus one additional course from any of the five areas; no more than two courses may be selected from any discipline.

18

World Cultures and Global Issues

US Experience in its Diversity

Individual and Society

Creative Expression

Scientific World

Option in African American Studies

Students choosing to concentrate in African American Studies must take 12 credits from a list of specific AFR courses. These may be chosen as part of the Flexible Core or Free Electives, and must also include an AFR capstone. Please see the African American Studies department listing or your advisor for more information.

Writing Intensive Requirement³

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS	25-30 CREDITS
Foreign Language I	3
Foreign Language II	3
Foreign Language III	3
Speech	3
Philosophy	3
History	3
Capstone from approved list	3
Free Electives	4-9
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES	25-30
TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS	30-35
TOTAL CREDITS REQUIRED FOR THE DEGREE	60

¹ Students must complete ENG 1101 with a "C" or better to graduate.

² Students who take higher level MAT or STEM Variant courses will have 31-35 general education credits, thus reducing the elective credits.

³ A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

Associate in Science in LIBERAL ARTS AND SCIENCES (LAS)

The associate in science degree is a comprehensive liberal arts and sciences curriculum emphasizing the application of scientific knowledge and mathematics for problem-solving. The graduating student receives preparation for continuing education in the sciences, engineering and mathematics as well as the professional world. The curriculum also includes courses in literature, communication and the social and behavioral sciences. Students are encouraged by the faculty to take part in research projects which may lead to presentations at scholarly conferences. The capstone course (options are listed in the table at the end of this section) serves as a culminating academic experience requiring the use and integration of oral and written communication, critical thinking and analysis.

A maximum of 11 elective credits required for the degree in Liberal Arts and Sciences (LAS) may be chosen from courses offered by the Schools of Technology and Design or Professional Studies, with permission from the Dean of Arts and Sciences, the Namm Building, room N 321, at 718.260.5008, and the Program Director of Liberal Arts and Sciences, the Pearl Building, room P 616, at 718.260.5014.

Learning Outcomes

- Effective oral and written communication skills
- Team work and problem solving skills
- Foundations in computer and information literacy, with critical thinking skills, for lifelong learning
- Foundations of scientific research including testing and validation of scientific theories, and application of scientific reasoning.
- Fundamental, interdisciplinary knowledge of the natural sciences
- Quantitative literacy through the study of calculus
- Fundamental knowledge of the behavioral and social sciences
- Fundamental knowledge of philosophy
- Fundamental knowledge of literature

Academic Advisement

Academic advisement for first semester students takes place in the New Student Center, located in the Namm Building, room N 104. All other students receive advisement through the Office of Liberal Arts, located in the Pearl Building, room P 616. Students are strongly urged to consult with their academic advisor before registering for classes.

Pathways to Baccalaureate Programs

Graduating LAS students can readily transfer into most baccalaureate degree programs. Transfer of 60 credits to all colleges within The City University of New York system is assured. For information on transfer into City Tech's programs in Applied Math (AFB, ASB), Math Education, Biomedical Informatics, Computer Engineering and Baruch's Zicklin School of Business after earning the LAS degree, contact the Dean of the School of Arts and Sciences, Namm 321, at 718.260.5008, or go to <http://www.citytech.cuny.edu/academics/deptsites/liberalartsandsciences/las.pdf>

Performance and Academic Standards

- Students required to take the prerequisites MAT 1175, MAT 1275 and/or MAT 1375 will need an additional 4, 8 or 12 credits, respectively, to graduate.

For information about the articulation agreement with the Physicians Assistant program at SUNY Downstate Medical Center of Health Related Professional, please contact the Biological Sciences Department.

Physics Option

An option in Physics is available. For details, please refer to the Physics Department catalog description.

Degree Requirements

The College will grant an associate in science degree (AS) upon satisfactory completion of the required 60 credits as indicated.

GENERAL EDUCATION COMMON CORE ¹		33-35 CREDITS
I – REQUIRED CORE		
English (2 courses, 6 credits)		
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
Mathematical and Quantitative Reasoning ¹ (1 course, 4 credits)		
Any approved course		4
Life and Physical Sciences (1 course, 4-5 credits)		
Any one of the following courses is recommended		
CHEM 1110	General Chemistry I	4
BIO 1101	Biology I	4
BIO 2311	Human Anatomy and Physiology I	4
PHYS 1117	Astronomy I	4
PHYS 1433	General Physics I: Algebra Based	4
PHYS 1441	General Physics I: Calculus Based	5
II – FLEXIBLE CORE (6 COURSES, 19-20 CREDITS)		
Select one course from each of the following areas; plus one additional course from any of the five areas; no more than two courses may be selected from any discipline.		19-20
World Cultures and Global Issues		3
US Experience in its Diversity		3
Individual and Society		3
Creative Expression		3
Scientific World		
Any one of the following courses is recommended:		
CHEM 1210	General Chemistry II	4
BIO 1201	Biology II	4
BIO 2311	Human Anatomy and Physiology I	4
BIO 2312	Human Anatomy and Physiology II	4
BIO 3302	Microbiology	4
BIO 3350	Bioinformatics I	4
PHYS 1118	Astronomy II: Stars, Galaxies, Cosmology	4
PHYS 1434	General Physics II: Algebra Based	4
PHYS 1442	General Physics II: Calculus Based	5
Writing Intensive Requirement ²		
Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.		

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 25-27 CREDITS

Science Sequence

In addition to the Life and Physical Sciences and Scientific World requirements above, a science sequence is required for the degree and may be selected from the list below

BIO 1101	Biology I	4
BIO 1201	Biology II	4
or		
CHEM 1110	General Chemistry I	4
CHEM 1210	General Chemistry II	4
or		
PHYS 1117	Astronomy I	4
PHYS 1118	Astronomy II: Stars, Galaxies, Cosmology	4
or		
PHYS 1433	General Physics I: Algebra Based	4
PHYS 1434	General Physics II: Algebra Based	4
or		
PHYS 1441	General Physics I: Calculus Based	5
PHYS 1442	General Physics II: Calculus Based	5
or		
BIO 2311	Human Anatomy and Physiology I	4
BIO 2312	Human Anatomy and Physiology II	4
or		
CHEM 2223	Organic Chemistry I	5
CHEM 2323	Organic Chemistry II	5
or		
BIO 3302	Microbiology	4
BIO 3620	Molecular and Cell Biology	4
or		
BIO 3350	Bioinformatics I	4
BIO 3352	Bioinformatics II	4
or		
CHEM 3312	Analytical Chemistry	5
CHEM 3412	Instrumental methods of Analysis	5

Mathematics ³ (4 credits)

MAT 1475	Calculus I	4
MAT 1575	Calculus II	4
or		
MAT1372	Statistics with Probability	3
and		
MAT 1476L	Calculus Lab	1
Capstone (select from approved list)		3-5 credits
Free/Unrestricted Electives to reach 60 credits		

Physics Option

Students wishing to take the Physics Option should take PHYS 1441 and PHYS 1442 and choose two of the following courses:

PHYS 1117	Astronomy I	4
PHYS 1118	Astronomy II: Stars, Galaxies, Cosmology	4
PHYS 2443	Modern Physics	4
PHYS 2605	Introduction to Laser Physics and Photonics	4

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 25-27

TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS	33-35
TOTAL CREDITS REQUIRED FOR THE DEGREE	60

¹ This is a STEM degree program requiring 4-credit courses in mathematics. Students may elect to use a required 4-credit mathematics course to meet the Common Core requirement in Mathematical and Quantitative Reasoning.

² A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

³ Students who do not have sufficient background in mathematics to place into MAT 1475 can take MAT 1275 and MAT 1375 to satisfy the Mathematical and Quantitative Reasoning and Scientific World requirements in order to complete the degree with no more than 60 credits.

Capstone Courses*

These courses fulfill the LAA/LAS Associate Capstone requirement, though it can also be taken for other requirements and electives. The City Tech LAA/LAS Associate Capstone is designed for students entering their second year in the program. LAA/LAS Associate Capstone courses are meant to prepare students to continue their studies in a bachelor's degree, third-year, or junior, level. In addition, Associate Capstone courses are meant to help students develop an awareness of the importance of knowledge, values and skills developed in general education courses; and to integrate this knowledge, these values and these skills into their advanced academic study and professional careers.

Course Number	Course Name	Prerequisite
AFR 2202	Contemporary Black Writers	ENG 1101, previous AFR course
AFR 2402(ID)	The Heritage of Imperialism	ENG 1101, previous AFR course
BIO 2450	Genetics	BIO 1201
CHEM 2223	Organic Chemistry I	CHEM 1201
CHEM 2323	Organic Chemistry II	CHEM 2223
ENG 3401	Law through Literature	ENG 1121/EG 121
ENG 3402	Topics in Literature	ENG 1121/EG 121 or any 2000-level literature course (AFR, ENG, PRS) ENG 3403/EG 403 One Major Writer ENG 1121/EG 121 or any 2000-level literature course
ENG 3403	One Major Writer	ENG 1121 or any 2000-level literature course
ENG 3407	Gothic Literature and Visual Culture	ENG 1121./EG 121 or Any 200-level literature course (AFR, ENG, PRS)
ECON 2403	Labor Management Relations	ECON 1101/EN 101
ECON 2505(ID)	Environmental Economics	ECON 1101 or ECON 1401
GOV 2401	Constitutional Law	LAW 1201/LS 201 or GOV 1101/GO 101 or GOV 1102/GO 102
GOV 2402	Public Policy	GOV 1101/GO 101 or GOV 1102/GO 102
HIS 2405	History of Foodways in the United States	One previous History class
HIS 3208	History of Immigration, Ethnicity, and Nativism in America	ENG 1101 and one previous History class
HIS 3209	History of Technology	ENG 1101 and one previous History class
HIS 3310	Environmental History of North America	One previous HIS, AFR, LATS course or ARCH 2321 or ARCH 3551
HIS 3402	Global Encounters: Topics in Twentieth Century World History	ENG 1101/EG 1101 and any previous History class
MAT 2580	Introduction to Linear Algebra	MAT 1575
MAT 2680	Differential Equations	MAT 1575
PHIL 3209	Philosophy of Religion	One previous Philosophy course
PHIL 3211	Philosophy of Law	One previous Philosophy course
PHIL 3400	Environmental Philosophy	One previous Philosophy course
PHYS 2443	Modern Physics	PHYS1441-1442 OR PHYS 1433-1434
PSY 2300	Developmental Psychology	PSY 1101/PS 101
PSY 2301	Child Development	PSY 1101/PS 101
PSY 2302	Psychology of Adolescence and Adulthood	PSY 1101/PS 101
PSY 2303	Psychology of Aging	PSY 1101/PS 101
PSY 2401	Social Psychology	PSY 1101/PS 101
PSY 2402	Psychology of Personality	PSY 1101/PS 101
PSY 2403	Abnormal Psychology	PSY 1101/PS 101
PSY 2404	Personnel and Organizational Psychology	PSY 1101/PS 101

Course Number	Course Name	Prerequisite
PSY 3405	Health Psychology	PSY 1101/PS 101
PSY 3407	Psychology of Visual Perception	ENG 1101/EG 101, PSY 1101/PS 101
SOC 2201	Sociology of Aging	SOC 1101
SOC 2401	Society, Technology and Self	SOC 1101/SO 101
SOC 2403	Law and Society	SOC 1101/SO 101 or PSY 1101/PS 101
SOC 3301	The Emerging Global Society	ENG 1101/EG 101 and one of the following: any Sociology (SOC) course, ECON 1101/EN 101 or HIS 1102/HI 102
SOC 3302(ID)	Environmental Sociology	ENF 1101 and any ANTH or SOC course
SOC 3402	Sociology of Social Problems	SOC 1101/SO 101, ENG 1101/EG 101
COM 3401	Communication for Business, Industry and the Professions	ENG 1121/EG 121 or higher, and CST1101/CS101 or MST 1101/MS 101 or department approval required, and SPE 1330/TS 330 or higher

Mathematics

Professor Sandie Han, Chair

Namm Hall, room N 711

718.260.5380

email: shan@citytech.cuny.edu

<http://www.citytech.cuny.edu/academics/deptsites/mathematics/>

PROGRAMS:

Computer Science/AS

Applied Mathematics–Financial Science/BS

Applied Mathematics–Information Science/BS

Applied Mathematics–Science/BS

Mathematics Education/BS

FACULTY:

Professors: Africk, Douglas, Ellner, Ghosh-Dastidar, Han, Hill, Kahrobaei, Katz, Kramer, Liou-Mark, Natov, Rojas, Schoutens, Taraporevala, Tradler

Associate Professors: Benakli, Bonanome, Carley, Cermele, Chen, El-Hitti, Ghezzi, Johnstone, Reitz, Rozenblyum, Yuce, Zhou

Assistant Professors: Bessonov, Calinescu, DeSantis, Greenstein, Halleck, Harrow, Isaacson, Kennedy, Koca, Kostadinov, Li, Masuda, Miller, Parker, Poirier, Singh, Smith, Thiel

Lecturers: Colucci, Kan, Niezgoda

MATHEMATICS

Mathematics is the language of science and technology. It is the language used to translate real world problems into a form in which a solution can be found. It is the goal of the department to provide all students with the mathematical foundation they need for their careers and for lifelong learning.

The mathematics department offers a full range of courses, from non-credit classes for students whose mathematics preparation is insufficient for credit-level work to those designed for students in all degree programs at the college. The mathematics department also offers three degree programs, an associate degree program (AS) in Computer Science, a baccalaureate degree program (BS) in applied mathematics and a baccalaureate degree program (BS) in mathematics education.

The computer science associate degree program provides students with the first two years of study leading to a baccalaureate degree in computer science, computer information science, computer systems technology, computer engineering technology or applied mathematics. Computer science is an excellent field of study for those seeking career opportunities in the worlds of business, education, government and industry.

The applied mathematics baccalaureate degree program is designed for students with an interest in mathematics and real world problem solving. An applied mathematics degree is quite versatile, and graduates will have the skills needed to adapt to a rapidly changing work environment. Upon graduation, students can begin careers in the financial, information, and scientific industries. The program contains three options: (1) Information Science, (2) Financial Science and (3) Science.

The mathematics education baccalaureate degree program is designed for students who wish to teach mathematics in middle

school or high school. The program provides students with a strong mathematics background as well as the education courses that are required for teaching certification.

Employers value computer science and mathematics graduates, not just for their specific technical skills, but for the broad analytic and problem-solving abilities that are developed in the study of these subjects. Both computer science and mathematics programs feature internship opportunities, where students can earn credits while working for an actual real world employer. There are also opportunities to work with faculty on research projects, attend seminars, present at conferences, and engage in social activities with other students with similar interests through the student run math club. Special scholarship programs are available for qualified students, sponsored by the National Science Foundation and other organizations.

Associate in Science in COMPUTER SCIENCE

The Computer Science associate degree program provides students with the first two years of study leading to a baccalaureate degree in computer science, computer information science, computer systems technology, computer engineering technology or applied mathematics.

The language of mathematics is used to translate the solutions of real-world problems into algorithms. Constructing efficient and effective algorithms to solve a particular problem is the business of computer science. An algorithm is a step-by-step procedure that tells a computer what to do. Algorithms search, sort, evaluate, analyze, transfer, code and decode information. Constructing efficient and effective algorithms to solve particular problems is the business of computer science. Therefore, the focus of this program is on problem-solving with a heavy emphasis on applied mathematics.

Computer science is an excellent field of study for those seeking career opportunities in the worlds of business, education, government and industry. Employers value computer science graduates, not just for their specific technical skills, but for the broad analytic and problem-solving abilities that are developed in the study of computer science.

Medical, pharmaceutical and financial disciplines as well as the information and design industries depend heavily on computer science graduates. In addition, the massive amount of information generated by business, industry, government, science and communications requires algorithms to maintain, control, mine, warehouse and secure data.

The Computer Science program is sponsored by the Mathematics Department. The curriculum consists of a broad spectrum of mathematics, science, general education, computer science and computer engineering courses. The program is designed to prepare the student for the more advanced work required for the baccalaureate degree.

The first two years are devoted to establishing mathematical sophistication, constructing and analyzing algorithms, learning to write object-oriented programs and becoming familiar with the architecture of a computer. Internships are available to give students work experience.

To be eligible for admission into the Computer Science program, students must be CUNY-proficient in reading and mathematics. In order to begin the full first semester sequence of courses, students must have also completed MAT 1375 or the equivalent. Students not prepared to take MAT 1475 will be required to take up to an additional 12 credits of the mathematics prerequisites, MAT 1175, MAT 1275 and MAT 1375.

Learning Outcomes for Computer Sciences Majors

Computer Science graduates will:

- Demonstrate a working knowledge and understanding of statistics, calculus, linear algebra and mathematical applications
- Develop programming and logical reasoning skills
- Exhibit an ability to perform mathematical manipulations and calculations using available technology
- Show an ability to integrate discrete mathematical structures and algorithms into a programming environment
- Develop improved competence at abstract conceptual reasoning
- Demonstrate intellectual curiosity, critical evaluation skills and the ability to reach and justify conclusions
- Become a more effective and persuasive communicator
- Demonstrate knowledge of science, literature and economics

Degree requirements

The College will grant an associate in science (AS) degree with a major in Computer Science upon satisfactory completion of the required 60 credits listed.

GENERAL EDUCATION COMMON CORE ¹		33-34 CREDITS
I – REQUIRED CORE (4 COURSES, 15 CREDITS)		
English Composition (2 courses, 6 credits)		
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
Mathematical and Quantitative Reasoning (1 course, 4 credits)		
MAT 1475 or higher ²	Calculus I	4
Life and Physical Sciences (1 course, 5 credits)		
PHYS 1441/ PHYS 1441L	General Physics I: Calculus Based	5
II – FLEXIBLE CORE (6 COURSES, 18-19 CREDITS)		
In addition to the required course listed below, select one course from each of the following four areas, plus one additional course from any of the five areas; no more than two courses may be selected from any discipline.		15
World Cultures and Global Issues		
Any Approved Course		
US Experience in its Diversity		
Any Approved Course		
[ECON 1101	Macroeconomics (recommended)]	3

Individual and Society

Any Approved Course

Creative Expression

Any Approved Course

Scientific World

MAT 1372	Statistics with Probability	3
	or	
MAT 2572	Probability and Mathematical Statistics I	4

Writing Intensive Requirement ³

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 26-27 CREDITS

ECON 1101	Macroeconomics	3
PHYS 1441	General Physics I: Calculus Based	Met as GenEd
MAT 1372	Statistics with Probability	Met as GenEd
	or	
MAT 2572	Probability and Mathematical Statistics I	
MAT 2580	Introduction to Linear Algebra	3
MAT 1476L	Calculus laboratory	1
	or	
CST 1101	Problem Solving with Computer Programming	3
MAT 1575	Calculus II	4
MAT 2440	Discrete Structures and Algorithms I	3
MAT 2540	Discrete Structures and Algorithms II	3
CST 2403	Introductory C++ Programming I	3
CST 3503	C++ Programming II	3

ELECTIVES ⁴

Select from approved elective list to meet or exceed 60 credits.

These choices should be made in consultation with an academic advisor

BIO 1101	Biology I	4
BIO 2311	Human Anatomy and Physiology I	4
BIO 2312	Human Anatomy and Physiology II	4
BIO 3350	Elements of Bioinformatics	4
CHEM 1110	General Chemistry I	4
CHEM 1210	General Chemistry II	4
CHEM 2223	Organic Chemistry I	5
CHEM 2323	Organic Chemistry II	5
COMD 2450	Web Design I	2
COMD 3551	Web Design II – Advanced XHTML and CSS	3
COMD 3652	Web Design III – Design Studio	3
CST 1204	Database Systems	3
CST 2307	Networking Fundamentals	3
CST 3504	Database Design	3
CST 3603	Object-Oriented Programming	3
ECON 2301	Money and Banking	3
MAT 2588	The Mathematics of Finance	3
MAT 2572	Probability and Mathematical Statistics I	4

MAT 2630	Applied Mathematics Technology – Numerical Methods	3
MAT 2675	Calculus III	4
MAT 2680	Differential Equations	3
MAT 2899	Independent Research Project – Computer Science	2
MAT 2900	Internship – Computer Science	2
MAT 3672	Probability and Mathematical Statistics II	4
PHYS 1442	General Physics II: Calculus Based	5

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES **26-27**

TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS **33-34**

TOTAL CREDITS REQUIRED FOR THE DEGREE **60**

1 This program has received a waiver to specify particular courses students must take in some areas of the Common Core. If students take different courses in these areas, they will be certified as having completed the Common Core areas, but it may not be possible for them to finish their degree program within the regular number of credits.

2 Students without the requisite math background to enter MAT 1475 will be required to take MAT 1175, MAT 1275, and/or MAT 1375 in preparation. This will increase the number of required credits for the degree by 4-12 credits.

3 A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

4 Students may potentially substitute one course for an elective class. Consultation with and approval of a faculty advisor is required.

Bachelor of Science in APPLIED MATHEMATICS

The Applied Mathematics program is designed for students with an interest in mathematics and real-world problem-solving.

An applied mathematics degree is quite versatile, and provides graduates with the skills needed to adapt to a rapidly changing work environment. Upon graduation, students are equipped to begin careers in the financial, information, pharmaceutical and related industries. The program contains three options: information science, financial science and science. Students must complete a set of common required courses as well as one of the three sequences. A two-semester internship is also required, which is essential for finding employment.

Learning Outcomes for Applied Mathematics Majors

Applied mathematics graduates will be able to:

- Organize and analyze data
- Formulate problems mathematically and choose appropriate methods to solve them
- Make detailed logical arguments
- Use technology effectively in the solutions to mathematical problems when it is appropriate
- Communicate clearly and persuasively
- Make professional presentations
- Be prepared to enter the workforce or pursue a Master's degree

Concentration 1: (AIB) Applied Mathematics – Information Science

Graduates can work as analysts in the information industries with job titles that include data analyst, network engineer and IT specialist. These analysts use computer-based mathematical models to optimize communication networks. The program includes hands-on experience in designing telecommunication systems and the mathematical tools needed to analyze them.

Concentration 2: (AFB) Applied Mathematics – Financial Science

Job titles for graduates from this option include financial analyst, statistician and quantitative programmer. Analysts in the financial industries use computer-based mathematical models to analyze securities (such as stocks) in order to project future prices and provide assessment of risk. They help businesses and individuals to make investment decisions. The curriculum places a heavy emphasis on statistics and on the computer programming skills needed in applications.

Concentration 3: (ASB) Applied Mathematics – Science

This concentration is designed for those interested in applying mathematics to medical and related industries. There is an emphasis on statistics, biology and chemistry. There are many options for graduates including scientist, research analyst, scientific programmer and statistician. The applications of mathematics in this industry include designing experiments to test drug safety and effectiveness, creating computer-based models of the spread of disease and assessing the risks of different medical treatments.

Admission into the Program in Applied Mathematics

Students applying for admission must meet the College standards for admission into a baccalaureate program and must be eligible to enroll in MAT 1475. Prospective transfer students should consult with the Mathematics Department at the earliest possible point to be certain that they gain maximum transfer credit and that they enter the program with the requisite background. Current City Tech students seeking to enter the program must secure the approval of the Mathematics Department to file a change of curriculum request with the Office of the Registrar. Students should be aware that the program requires a high level of math proficiency and that those unprepared for the rigorous coursework may be obliged to complete prerequisites before beginning their upper-level coursework in applied mathematics. This may add to the credits required for graduation.

The College will grant a bachelor of science degree in Applied Mathematics upon a student's successful completion of the 120 credits of the degree requirements.

BS APPLIED MATHEMATICS – INFORMATION SCIENCE

GENERAL EDUCATION COMMON CORE 42 CREDITS

I – REQUIRED CORE¹ (4 COURSES, 13-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1475	Calculus I or higher meets a degree requirement	4
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Life and Physical Sciences

PHYS 1441	General Physics I: Calculus Based (recommended)	3-5
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II – FLEXIBLE CORE (6 COURSES, 18-20 CREDITS)

World Cultures and Global Issues

Any approved course		3
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US Experience in its Diversity

ECON 1101	Macroeconomics (recommended)	3
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Individual and Society

		3
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Creative Expression

		3
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Scientific World

PHYS 1442	General Physics II: Calculus Based (recommended)	3-5
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One additional course from any group 3

MAT 2440	Discrete Structures and Algorithms I (recommended)	
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III – COLLEGE OPTION REQUIREMENT² (7-12 CREDITS)

- One course in Speech/Oral Communication
COM 1330 Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course
Any approved course 3

- Additional liberal arts credits to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

78 CREDITS

CST 2403	C++ Programming I	3
CST 3503	C++ Programming II	3
EET 1222	Circuit Analysis II	5
EET 1240	Electronics	4
EET 2140	Communications Electronics	3
EET 2162	Digital Electronics I	3
MAT 1475 ³	Calculus I	4
MAT 1476L	Calculus Laboratory	1
MAT 1575	Calculus II	4
MAT 2440	Discrete Structures and Algorithms I	3
MAT 2572	Probability and Mathematical Statistics I	4
MAT 2580	Introduction to Linear Algebra	3
MAT 2630	Applied Mathematics Technology – Numerical Methods	3
MAT 2675	Calculus III	4
MAT 3770	Mathematical Modeling I – Optimization	3
MAT 4880	Mathematical Modeling II	3
MAT 4900	Internship I	2
MAT 4901	Internship II	2
PHYS 1441	General Physics I: Calculus Based	5
PHYS 1442	General Physics II: Calculus Based	5
TCET 2102	Analog and Digital Telephony	4
TCET 2242	Microcomputer Interfacing	3
TCET 3102	Analog and Digital Communications I	4

Electives (select as needed to add up to 78⁴)

CST 2307	Networking Fundamentals	3
CST 3507	Advanced Single-LAN Concepts	3
MAT 2540	Discrete Structures and Algorithms II	3
MAT 2680	Differential Equations	3
MAT 3672	Probability and Mathematical Statistics II	4
MAT 3772	Stochastic Models	3
MAT 3777	Applied Mathematics – Applications of the Wave Equation	3
MAT 3787	Applied Mathematics – Finite Fields	3
MAT 3788	Applied of the Heat Equation for Financial Mathematics	3
MAT 3880	An Introduction to Partial Differential Equations	3
MAT 4672	Computational Statistics	3
MAT 4872	Probability and Mathematical Statistics III	4

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES	78
TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS	42
TOTAL CREDITS REQUIRED FOR THE DEGREE	120

1 Students are advised to consult the program-specific requirements for “double-duty” courses: program-specific requirements that also meet CUNY Pathways general education requirements in that category. If students take different courses in these areas, they will be certified as having completed the Common Core areas, but it may not be possible for them to finish their degree program within the regular number of credits.

2 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

3 Students without the requisite math background to enter MAT 1475 must take MAT 1175, MAT 1275 and/or, MAT 1375 in preparation, depending on initial placement. This will increase the number of required credits for the degree by 4-12.

4 Some program-specific required courses might also satisfy the General Education Common Core. For example, a student satisfies quantitative reasoning by taking MAT 1475 Calculus I for 4 credits. The student could then take MAT 4872 as a 4 credit elective.

BS APPLIED MATHEMATICS – FINANCIAL SCIENCE

GENERAL EDUCATION COMMON CORE **42 CREDITS**

I – REQUIRED CORE¹ (4 COURSES, 13-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning² (1 course, 4 credits)

MAT 1475	Calculus I or higher meets a degree requirement	4
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Life and Physical Sciences

PHYS 1441	General Physics I: Calculus Based (recommended)	3-5
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II – FLEXIBLE CORE (6 COURSES, 18-20 CREDITS)

World Cultures and Global Issues

Any approved course	3
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US Experience in its Diversity

ECON 1101	Macroeconomics (recommended)	3
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Individual and Society

	3
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Creative Expression

	3
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Scientific World

PHYS 1442	General Physics II: Calculus Based (recommended)	3-5
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One additional course from any group

MAT 2440	Discrete Structures and Algorithms I (recommended)	3
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III – COLLEGE OPTION REQUIREMENT³ (12 CREDITS)

- One course in Speech/Oral Communication
COM 1330 Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course
Any approved course 3
- Additional liberal arts credits to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS **78 CREDITS**

CST 1204	Database Systems	3
CST 2403	C++ Programming I	3
CST 3503	C++ Programming II	3
CST 3504	Database Design	3
ECON 1101	Macroeconomics	3
ECON 2301	Money and Banking	3
MAT 1475	Calculus I ⁴	4
MAT 1476L	Calculus Laboratory	1
MAT 1575	Calculus II	4
MAT 2440	Discrete Structures and Algorithms I	3
MAT 2572	Probability and Mathematical Statistics I	4

MAT 2580	Introduction to Linear Algebra	3
MAT 2630	Applied Mathematics Technology – Numerical Methods	3
MAT 2675	Calculus III	4
MAT 2680	Differential Equations	3
MAT 3672	Probability and Mathematical Statistics II	4
MAT 3770	Mathematical Modeling I – Optimization	3
MAT 3772	Stochastic Models	3
MAT 3788	Applications of the Heat Equation for Financial Mathematics	3
MAT 4672	Computational Statistics with Applications	3
MAT 4788	Financial Risk Modeling	3
MAT 4900	Internship I	2
MAT 4901	Internship II	2
PHYS 1441	General Physics I: Calculus Based	5
Electives (select as needed to add up to 78⁵)		
MAT 2540	Discrete Structures and Algorithms II	3
MAT 3787	Applied Mathematics – Finite Fields	3
MAT 3880	An Introduction to Partial Differential Equations	3
MAT 4872	Probability and Mathematical Statistics III	4
CST 3603	Object Oriented Programming	3
CST 3604	Quality Database Implementation	3
PHYS 1442	General Physics II: Calculus Based	5
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES		78
TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS		42
TOTAL CREDITS REQUIRED FOR THE DEGREE		120

1 Students are strongly urged to consult degree requirements for “double-duty” courses: degree requirements that also meet CUNY Pathways general education requirements in that category.

2 Applied Mathematics is a STEM degree program, requiring 4 or 5 credit courses in mathematics and science. Students may elect to use their required 4 or 5 credit Math or science courses to meet Common Core requirements.

3 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

4 Students without the requisite math background to enter MAT 1475 must take MAT 1175, MAT 1275 and/or, MAT 1375 in preparation, depending on initial placement. This will increase the number of required credits for the degree by 4-12.

5 Some program-specific required courses might also satisfy the General Education Common Core. For example, a student satisfies quantitative reasoning by taking MAT 1475 Calculus I for 4 credits. The student could then take MAT 4872 as a 4 credit elective.

BS APPLIED MATHEMATICS – SCIENCE		
GENERAL EDUCATION COMMON CORE		42 CREDITS
I – REQUIRED CORE¹ (4 COURSES, 13-14 CREDITS)		
English Composition (2 courses, 6 credits)		
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
Mathematical and Quantitative Reasoning (1 course, 4 credits)		
MAT 1475	Calculus I or higher meets a degree requirement	4
Life and Physical Sciences		
CHEM 1110	General Chemistry I (recommended)	3-4
II – FLEXIBLE CORE (6 COURSES, 18-19 CREDITS)		
World Cultures and Global Issues		
Any approved course		3
US Experience in its Diversity		3
ECON 1101	Macroeconomics (recommended)	
Individual and Society		3
Creative Expression		3
Scientific World		
CHEM 1210	General Chemistry II (recommended)	3-4
One additional course from any group		3
MAT 2440	Discrete Structures and Algorithms I (recommended)	

III – COLLEGE OPTION REQUIREMENT² (9-12 CREDITS)

- One course in Speech/Oral Communication
COM 1330 Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course
Any approved course 3
- Additional liberal arts credits to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS		78 CREDITS
BIO 1101	Biology I	4
BIO 2311	Human Anatomy and Physiology I	4
CST 1101	Problem Solving with Computer programming	3
CST 2403	C++ Programming I	3
CST 3503	C++ Programming II	3
CHEM 1110	General Chemistry I	4
CHEM 1210	General Chemistry II	4

CHEM 2223	Organic Chemistry I	5
MAT 1475	Calculus I ³	4
MAT 1575	Calculus II	4
MAT 2440	Discrete Structures and Algorithms I	3
MAT 2572	Probability and Mathematical Statistics I	4
MAT 2580	Introduction to Linear Algebra	3
MAT 2630	Applied Mathematics Technology – Numerical Methods	3
MAT 2675	Calculus III	4
MAT 2680	Differential Equations	3
MAT 3672	Probability and Mathematical Statistics II	4
MAT 3770	Mathematical Modeling I – Optimization	3
MAT 3772	Stochastic Models	3
MAT 3880	An Introduction to Partial Differential Equations	3
MAT 4672	Computational Statistics	4
MAT 4900	Internship I	2
MAT 4901	Internship II	2

Electives (select as needed to add up to 78⁴)

BIO 2312	Human Anatomy and Physiology I	4
CHEM 2323	Organic Chemistry I	5
MAT 2540	Discrete Structures and Algorithms II	3
MAT 3777	Applied Mathematics Applications of the Wave Equation	3
MAT 3787	Applied Mathematics – Finite Fields	3
MAT 3788	Applications of the Heat Equation for Financial Mathematics	3
MAT 4788	Financial Risk Modeling	3
MAT 4872	Probability and Mathematical Statistics III	4
MAT 4880	Mathematical Modeling II	3

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES **78**

TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS **42**

TOTAL CREDITS REQUIRED FOR THE DEGREE **120**

1 Students are advised to consult the program-specific requirements for “double-duty” courses: program-specific requirements that also meet CUNY Pathways general education requirements in that category. If students take different courses in these areas, they will be certified as having completed the Common Core areas, but it may not be possible for them to finish their degree program within the regular number of credits.

2 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

3 Students without the requisite math background to enter MAT 1475 must take MAT 1175, MAT 1275 and/or, MAT 1375 in preparation, depending on initial placement. This will increase the number of required credits for the degree by 4-12.

4 Some program-specific required courses might also satisfy the General Education Common Core. For example, a student satisfies quantitative reasoning by taking MAT 1475 Calculus I for 4 credits. The student could then take MAT 4872 as a 4 credit elective.

Bachelor of Science in MATHEMATICS EDUCATION

The mathematics education baccalaureate degree program is designed to prepare middle school and high school mathematics teachers. The program helps future mathematics teachers acquire extensive pedagogical knowledge and skills complemented by a solid mathematical background. Graduates of the program are very competitive in finding teaching positions in New York State. They are also well prepared for graduate school in mathematics education or pure mathematics. In addition, the strong mathematical training provided by this program makes graduates desirable to business, government, and industry.

Learning Outcomes for Mathematics Education Majors

Mathematics education graduates will be able to:

- Create instructional plans to promote and enhance critical thinking, and problem solving abilities.
- Create instructional plans that accommodate diverse needs of adolescent learners.
- Use technology appropriate to the teaching and learning situations.
- Develop a variety of formative and summative assessment instruments.
- Self-reflect on professional practices and develop plans for continuous professional development.
- Develop instructional plans based on current adolescent development and learning theories.
- Teach mathematics through integration of content to other disciplines and application to real-world settings.
- Create a classroom management plan and maintain a positive learning environment.
- Plan, implement, and evaluate effective instruction in the middle and secondary school classroom.
- Demonstrate collaborative relationships with educators, parents, and administration.
- Make professional presentations.
- Enter a Master’s degree program in pure mathematics or mathematics education.

Admission into the Program in Mathematics Education

Students applying for admission must satisfy the College requirements for admission into a baccalaureate program and must be eligible to enroll in MAT 1475. All applicants must submit an application, write an essay and be interviewed by program faculty.

Prospective transfer students must have a minimum cumulative GPA of 3.0* and have completed prerequisites for MAT 1475 or higher. They should consult with the Mathematics Department at the earliest possible point to be certain that they gain maximum transfer credit and that they enter the program with the requisite background. All students should be aware that the program requires a high level of math proficiency and that if they don’t meet the entry program requirements unprepared for the rigorous coursework they may need to successfully complete additional course work and prerequisites before they are able to enter the program and begin upper-level coursework in mathematics. This may add to the credits required for graduation.

*At the discretion of the program director or department chair, a student with a GPA lower than 3.0 may be admitted into the program.

Progression and Graduation Requirements

- Students must receive a grade of “C” or higher in each EDU or MEDU course taken in the major.
- Students must receive a grade of “C” or higher in each MAT course taken in the major.
- Students must have a minimum grade point average of 2.7 to graduate.

Students in the bachelor of science in Mathematics Education must satisfy a foreign language requirement. The foreign language requirement may be met in any one of the following ways:

- Successful completion of a 3-credit foreign language course at City Tech or transferred from another college.
- Earning a score of 85 or higher on the New York State Regents examination in a foreign language.
- A score of 4 or better on the advanced placement examination in a foreign language.
- Satisfactory completion of a College Level Examination Program (CLEP) test in a foreign language.
- Graduation from a higher education institution with a bachelor’s degree or its equivalent, in which the language of instruction was other than English.

Students who meet the foreign language requirement with a 3-credit college course will be required to complete 3 fewer credits within the mathematical applications component of the bachelor of science in Mathematics Education.

The College will grant a bachelor of science degree in Mathematics Education upon a student’s successful completion of the 120 credits of the degree requirements.

GENERAL EDUCATION COMMON CORE

43-47 CREDITS

I – REQUIRED CORE¹ (4 COURSES, 13-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1475	Calculus I ² or higher meets a degree requirement	4
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Life and Physical Sciences

3-5

II – FLEXIBLE CORE (6 COURSES, 18-20 CREDITS)

World Cultures and Global Issues

Foreign Language Requirement		
0-3 meets NY State degree requirements		3
Or any approved course if language requirement is met		

US Experience in its Diversity

3

Individual and Society

3

PSY 1101	Introduction to Psychology (recommended)	3
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Creative Expression

3

Scientific World

3-5

MAT 2572	Probability and Mathematical Statistics I (recommended)	4
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One additional course from any group

3

MAT 2580	Introduction to Linear Algebra (recommended)	3
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III – COLLEGE OPTION REQUIREMENT³ (12 CREDITS)

- One course in Speech/Oral Communication
COM 1330 Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course
Any approved course 3
- Additional liberal arts credits to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

77 CREDITS

MAT 1475	Calculus I	Met as GenEd
MAT 1476L	Calculus Laboratory	1
MAT 1575	Calculus II	4
MAT 2071	Introduction to Proofs and Logic	4
MAT 2572	Probability and Mathematical Statistics I	4
MAT 2580	Introduction to Linear Algebra ⁴	3
MAT 2630	Applied Mathematics Technology	3
MAT 3021	Number Theory	4
MAT 3050	Geometry I	4
MAT 3075	Introduction to Real Analysis	4
MAT 3080	Modern Algebra	4
MAT 4030	History of Mathematics ⁴	3
MAT 4050	Geometry II	3
MEDU 1010	Foundations of Mathematics Education	3
MEDU 1021	Teaching and Learning Strategies for Mathematics Teachers	3
MEDU 2010	Technology in Mathematics Education	2
MEDU 3011	Methods of Teaching Middle School Mathematics	4
MEDU 3020	Methods of Teaching Secondary School Mathematics	4
MEDU 4040	Supervised Student Teaching Mathematics Education	9
EDU 3670	Methods of Literacy Instruction in Teacher Education	3
PSY 1101	Introduction to Psychology ⁵	3
PSY 2501 / EDU 2610	Child and Adolescent Development ⁴	3
PSY 3502 / EDU 3610	Human Learning and Instruction ⁴	3
EDU 2455	Methods and Materials for Special Needs Students	3
EDU 4600	Professional Development Seminar	2
ENG 1101	English Composition I	Met as GenEd

ENG 1121	English Composition II	Met as GenEd
MAT 1475	Calculus I	Met as GenEd
COM 1330	Public Speaking	Met as GenEd
Foreign Language Requirement		Met as GenEd

Free Elective Credits (including 3 surplus GenEd credits above 42) 6

Applied Mathematics Component (Select up to 6 credits to make 120)

ARCH 2480	Structures I	3
ARCH 3522	A History of New York City Architecture	3
ARCH 3551	Sustainability: History and Practice	3
ARCH 3580	Structures II	3
ARCH 3640	Historic Preservation Theory and Practice	3
EET 1102	Techniques of Electrical Technology	2
EET 1122	Circuit Analysis I	4
EET 1222	Circuit Analysis II	5
PHYS 2443	Modern Physics	4
PHYS 2605	Introduction to Laser Physics and Photonics	4
PHYS 1117	Astronomy I	4
CET 3510	Microcomputer Systems Technology	4
CET 3525	Electrical Networks	4
CET 3625	Applied Analysis Laboratory	1
CET 3640	Software for Computer Control	3
CET 4705	Component and Subsystem Design I	2
CET 4773	Inter-networking Technology	4
CET 4805	Component and Subsystem Design II	2
CST 1101	Problem Solving with Computer Programming	3
CST 2403	Introductory C++ Programming Language Part I	3
CST 3503	C++ Programming Part II	3
MAT 2675	Calculus III	4
MAT 2680	Differential Equations	3
MAT 3672	Probability and Mathematical Statistics II	4
MAT 3770	Mathematical Modeling I – Optimization	3
MAT 4880	Mathematical Modeling II	3
MEDU 2901	Peer Leader Training in Mathematics	1

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 76

TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS⁶ 44

TOTAL CREDITS REQUIRED FOR THE DEGREE 120

¹ Students are advised to consult the program-specific requirements for “double-duty” courses: program-specific requirements that also meet CUNY Pathways general education requirements in that category. If students take different courses in these areas, they will be certified as having completed the Common Core areas, but it may not be possible for them to finish their degree program within the regular number of credits.

² Students who lack the requisite math background for MAT 1475 will be required to take MAT 1175, MAT 1275 and/or MAT 1375 in preparation, depending upon initial placement. This will increase the number of required credits for the degree by 4-8.

³ Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

⁴ Course may be taken in the College option

⁵ Course may be taken in the Flexible Core

⁶ Total LAS credits, including electives and additional mathematics courses, exceed 60.

Department of Mathematics General Education Program

The Mathematics Department seeks to provide students with the firm foundation in mathematics necessary for their careers as well as for today’s increasingly technological society. It is the goal of the department to provide the student with an understanding of the methodology of mathematical thought.

The department offers a full range of courses, from non-credit courses for students whose mathematics preparation is insufficient for credit-level work, to courses designed for students in all degree programs at the College. Initial placement in mathematics courses is determined by the student’s score on the CUNY mathematics placement test. All incoming and readmitted students must meet CUNY proficiency requirements in mathematics, as indicated by a passing score on the placement test. Students who are not proficient must successfully complete MAT 0630, MAT 0650, or MAT 0670 before enrolling in any other mathematics course.

All students are required to satisfy the mathematics component of the College’s general education core curriculum. Students should consult the statement of requirements of their major department before selecting courses, since the mathematics requirements may vary from department to department. Note that these statements list only the minimum requirements in mathematics. Normally, students should enroll in the highest course for which they are eligible, as shown on their advisement forms. Students who have completed mathematics courses at other colleges should consult with their major department advisor or a Mathematics departmental advisor to see if they are eligible for transfer credit. This should be done before enrolling in any mathematics course.

In addition to the textbook(s), most mathematics courses require a scientific calculator. Some may also require a graphing calculator. Students who purchase calculators other than those recommended by the instructor are responsible for learning how to operate them on their own.

Some sections of various courses integrate the use of the computer into the curriculum. Students enrolled in these sections will have computers available in open computer lab or learning centers for use in the completion of assignments.

COURSES:

MAT 0630

Elementary Algebra with Basic Mathematics Review

7 cl hrs, 0 cr

Fundamentals of elementary algebra with an integrated review and reinforcement of arithmetic skills. Topics include the real number system, numerical evaluation, algebraic operations, algebraic and graphical solutions of one and two variable linear equations, word problems, algebraic fractions, and quadratic equations. For students with a limited knowledge of elementary algebra. *Prerequisites:* For new students, a score of 39 or less on the ACCUPLACER Elementary Algebra test. For continuing students, an R or withdrawal grade in MAT 0630.

MAT 0650

Elementary Algebra

5 cl hrs, 0 cr

Topics include the real number system, numerical evaluation, algebraic operations, algebraic and graphical solutions of one and two variable linear equations, word problems, algebraic fractions, quadratic equations and the Pythagorean Theorem. For students with partial knowledge of elementary algebra. *Prerequisite:* For new students, a score of at least 40 but less than 56 on the ACCUPLACER Elementary Algebra Test. For continuing students, an R or withdrawal grade in MAT 0650

MAT 0670

Elementary Algebra Review

2 cl hrs, 0 cr

A review of elementary algebra for students who came close to passing MAT 0630 or MAT 0650. Offered during the intersession periods. *Prerequisites:* Department approval required and recommendation of instructor in MAT 0630 or MAT 0650

MAT 1175

Fundamentals of Mathematics*

4 cl hrs, 4 cr

Topics include linear and quadratic functions, equations of lines, parallel and perpendicular lines, intermediate algebra, plane geometry and trigonometry of the right triangle. *Prerequisite:* CUNY proficiency in math.

MAT 1180

Mathematical Concepts and Applications*

Pathways: Math and Quantitative Reasoning

4 cl hrs, 4 cr

Topics are selected from algebra, geometry, graphs of functions, inequalities, probability and statistics. *Prerequisite:* CUNY proficiency in reading and mathematics. Students who are not CUNY proficient must first take and pass MAT 0630 or MAT 0650 or MAT 0670

*Credit will not be given for both MAT 1175 and MAT 1180. Students who already have credit for MAT 1275, MAT 1372, MAT 1375 or higher will not receive credit for this course. Acceptable substitute for MAT 1190

MAT 1190

Quantitative Reasoning

Pathways: Math and Quantitative Reasoning

3 cl hrs, 0 lab hrs, 3 cr

Students develop and apply mathematical, logical, critical thinking, and statistical skills to solve problems in real-world contexts. They acquire skills in the fields of algebra, geometry, probability, statistics, and mathematical modeling. The course incorporates opportunities within the classroom to develop students' reading, writing, oral, and listening skills in a mathematical context. *Prerequisite:* For the 2015-2016 academic year only: CUNY proficiency in reading; proficiency in mathematics or successful completion of MAT 1190 preparatory workshop with an average of 75 or higher and a CEAPE score of 76 or higher.

* Students who already have credit for MAT 1275, MAT 1372, MAT 1375 or higher will not receive credit for this course. Acceptable substitute for MAT 1180

MAT 1215

Technical Mathematics with Applications I

Pathways: Math and Quantitative Reasoning

4 cl hrs, 4 cr

The first of a two-semester sequence of intermediate algebra and trigonometry with applications. Topics include exponents, equations, trigonometric functions, vectors, polynomials, rational expressions, equations and complex numbers. This course is open to students in the Verizon program only. *Prerequisites:* CUNY proficiency in mathematics and two years of high school mathematics

MAT 1272

Statistics

Pathways: Math and Quantitative Reasoning, Scientific World

3 cl hrs, 3 cr

An introduction to statistical methods and statistical inference. Topics include descriptive statistics, random variables, distributions, sampling, estimation and inference, t-tests, chi-square tests and correlation. *Prerequisite:* MAT 1180 or higher. Not open to students who have completed MAT 1372 or MAT 2572

MAT 1275

College Algebra and Trigonometry

Pathways: Math and Quantitative Reasoning

4 cl hrs, 4 cr

An intermediate and advanced algebra course. Topics include quadratic equations, the distance and midpoint formula, graphing parabolas and circles, systems of linear and quadratic equations, an introduction to exponential and logarithmic functions. Topics from trigonometry including basic trigonometric functions, identities, equations and solutions of triangles. *Prerequisites:* MAT 1175 or for new students, scores of at least 60 on the ACCUPLACER College Algebra Test

MAT 1280

Quantitative Mathematics

Pathways: Scientific World

4 cl hrs, 4 cr

Topics include probability, statistics, mathematics of finance, matrices, linear programming and optimization. *Prerequisite:* MAT 1180 or higher

MAT 1315

Technical Mathematics with Applications II

Pathways: Scientific World

4 cl hrs, 4 cr

The second of a two-semester sequence of intermediate algebra and trigonometry with applications. Topics include law of sines, law of cosines, logarithmic and exponential equations, absolute values and inequalities, advanced trigonometric graphs, exponents and radicals, introduction to statistics and graphical analysis. This course is open to students in the Verizon program only. *Prerequisite:* MAT 1215

MAT 1372

Statistics with Probability

Pathways: Scientific World

2 cl hrs, 2 lab hrs, 3 cr

Topics include sample spaces and probabilities, discrete probability distributions (Binomial, Hypergeometric), expectation and variance, continuous probability distributions (Normal, Student, Chi-Square), confidence intervals, hypothesis testing, and correlation and regression. Spreadsheets are used throughout the semester. *Pre- or corequisite:* MAT 1375; Not open to students who have completed MAT 2572

MAT 1375

Precalculus

Pathways: Math and Quantitative Reasoning, Scientific World

4 cl hrs, 4 cr

Topics include an in-depth study of functions such as polynomial functions, inverse functions, radical functions, rational functions, trigonometric functions, exponential and logarithmic functions; solving inequalities; elements of vectors and complex numbers; solving trigonometric equations and identities involving sum, double and half-angle formulas; Binomial Theorem; and progressions. A graphing calculator is required. *Prerequisite:* MAT 1275 or for new students, scores of at least 80 on the ACCUPLACER College Algebra Test

MAT 1475

Calculus I

Pathways: Math and Quantitative Reasoning, Scientific World

4 cl hrs, 4 cr

Topics include functions, limits, differentiation, tangent lines, L'Hôpital's Rule, Fundamental Theorem of Calculus and applications. *Prerequisite:* MAT 1375 or, for new students, a score of at least 65 on the Algebra part and of at least 95 on the ACCUPLACER College Algebra Test.

MAT 1476L

Calculus Laboratory

2 lab hrs, 1 cr

Through computer projects, students will apply and reinforce concepts and skills learned in MAT 1475. *Corequisite:* MAT 1475 or MAT 1575. Not open to students who have completed MAT 1575 or MAT 2630 or who are currently enrolled in MAT 2630

MAT 1575
Calculus II

Pathways: Math and Quantitative Reasoning, Scientific World

4 cl hrs, 4 cr

A continuation of MAT 1475. Topics include Taylor polynomials, Mean Value Theorem, Taylor and Maclaurin series, tests of convergence, techniques of integration, improper integrals, areas, volumes and arc length.

Prerequisite: MAT 1475

MAT 2071
Introduction to Proofs and Logic

4 cl hrs, 0 lab hrs, 4 cr

The course is designed to prepare students for an advanced mathematics curriculum by providing a transition from Calculus to abstract mathematics. The course focuses on the processes of mathematical reasoning, argument, and discovery. Topics include propositional and first order logic, learning proofs through puzzles and games, axiomatic approach to group theory, number theory, and set theory, abstract properties of relations and functions, elementary graph theory, sets of different cardinalities, and the construction and properties of real numbers.

Pre- or corequisite: MAT 1575

Equivalent to old course number MAT 2070

MAT 2440
Discrete Structures and Algorithms I

Pathways: Scientific World

2 cl hrs, 2 lab hrs, 3 cr

This course introduces the foundations of discrete mathematics as they apply to computer science, focusing on providing a solid theoretical foundation for further work. Topics include functions, relations, sets, simple proof techniques, Boolean algebra, propositional logic, elementary number theory, writing, analyzing and testing algorithms.

Prerequisites: (MAT 1375 or higher) and (CST 1201 or CST 2403)

MAT 2540
Discrete Structures and Algorithms II

Pathways: Scientific World

2 cl hrs, 2 lab hrs, 3 cr

This course continues the discussion of discrete mathematical structures and algorithms introduced in MAT 2440. Topics in the second course include predicate logic, recurrence relations, graphs, trees, digital logic, computational complexity and elementary computability.

Prerequisite: MAT 2440

MAT 2572
Probability and Mathematical Statistics I

Pathways: Scientific World

4 cl hrs, 4 cr

The study of discrete and continuous probability distributions including the Binomial, Poisson, Hypergeometric, Exponential, Chi-Squared and Normal Distribution. Conditional distributions, covariance and correlation, confidence intervals, least square estimation, chi-square goodness of fit distribution and test for independence and randomness. Ends with an application to queuing.

Prerequisite: MAT 1575

MAT 2580
Introduction to Linear Algebra

Pathways: Scientific World

3 cl hrs, 3 cr

An introductory course in Linear Algebra. Topics include vectors, vector spaces, systems of linear equations, linear transformations, properties of matrices, determinants, eigenvalues and eigenvectors.

Pre- or corequisite: MAT 1575

MAT 2588
The Mathematics of Finance

3 cl hrs, 3 cr

The study of financial derivatives including options, futures and forward contracts and the mathematical models used to price them.

Prerequisites: ECON 1101, MAT 1475;

Pre- or corequisites: ECON 2301, MAT 2572 or *Prerequisite* MAT 1372

MAT 2630
Applied Mathematics Technology – Numerical Methods

2 cl hrs, 2 lab hrs, 3 cr

An introduction to solving mathematical problems on the computer using a symbolic algebra program with applications drawn from science and engineering. Topics include roots of non-linear functions, interpolation, numerical differentiation and numerical integration.

Prerequisites: MAT 1575, MAT 2580 and one of the following: CST 1101 or higher or MAT 1475H or MAT 1476L

MAT 2675
Calculus III

4 cl hrs, 4 cr

A continuation of MAT 1575. Topics include parametric curves, partial derivatives, differentiable multi-variable functions, chain rule for multi-variable functions, vector fields, gradients, divergence, curl, Lagrange multipliers, multiple integrals, line integrals, Green's Theorem and Stokes' Theorem.

Prerequisite: MAT 1575; *pre- or corequisite:* MAT 2580

MAT 2680
Differential Equations

Pathways: Scientific World

3 cl hrs, 3 cr

Topics include methods of solving ordinary differential equations and applications to various problems.

Prerequisite: MAT 1575

MAT 2899
Independent Research Project – Computer Science

AS Degree

4 cl hrs, 2 cr

Students work with faculty to develop and complete a semester project for presentation. Assignments include identifying and clearly stating a problem; writing a proposal on alternative ways to tackle the problem; estimating the time and materials needed to solve the problem; outlining a step-by-step procedure that can be used to solve the problem; writing the algorithms needed to solve the problem; proving the problem has been solved (or is impossible to solve); and testing the efficiency of the algorithm using inductive arguments. A final oral presentation will be required.

Prerequisites: Department approval

MAT 2900
Internship – Computer Science

AS Degree

120 field hrs, 2 cr

A student will either find an employer who can employ his or her computer skills or a list of potential employers will be assigned to the student. The student's objective is to make a favorable impression on the employer and to identify and explain the job description. The student will keep a log/journal of each day's activities including objectives and progress towards those objectives. A faculty supervisor and job supervisor will actively consult on the progress of the internship. The final grade will be based on the completeness and quality of the journal, the job supervisor's evaluation and the intern's ability to make a final oral presentation.

Prerequisites: Department approval

MAT 3021
Number Theory

4 cl hrs, 0 lab hrs, 4 cr

This course is an introduction to number theory. Topics include Divisibility (Division algorithm, GCD, etc), primes, congruences, the fundamental theorem of arithmetic, quadratic reciprocity, number theoretic functions and Fermat's little theorem. Some applications will be done, which can be computer based, to encourage students to propose and test conjectures.

Prerequisite: MAT 2071

Equivalent to old course number MAT 3020

MAT 3050
Geometry I

4 cl hrs, 0 lab hrs, 4 cr

This course will cover Euclidean geometry in two dimensions from a synthetic point of view. It will cover classical theorems as well as groups of transformations.

Prerequisite: MAT 2071; *Pre- or corequisite:* MAT 3080

MAT 3075
Introduction to Real Analysis

4 cl hrs, 0 lab hrs, 4 cr

This course is an introduction to analysis of real functions of one variable with a focus on proof. Topics include the real number system, limits and continuity, differentiability, the mean value theorem, Riemann integral, fundamental theorem of calculus, series and sequences, Taylor polynomials and error estimates, Taylor series and power series.

Prerequisite: MAT 1575, MAT 2071

MAT 3080
Modern Algebra

4 cl hrs, 0 lab hrs, 4 cr

An introductory course in modern algebra covering groups, rings and fields. Topics in group theory include permutation groups, cyclic groups, dihedral groups, subgroups, cosets, symmetry groups and rotation groups. In ring and field theories topics include integral domains, polynomial rings, the factorization of polynomials, and abstract vector spaces.

Prerequisite: MAT 2580, MAT 2071

MAT 3672
Probability and Mathematical Statistics II

4 cl hrs, 4 cr

The study of multivariate normal distribution, the distribution of transformed vectors and order statistics. Includes generating functions, t- and F-distributions, central limit theorem, hypothesis testing, multiple regression, statistical inference for regression, diagnostic testing and design of experiments.

Prerequisites: MAT 2572, MAT 2580, MAT 2675

MAT 3770
Mathematical Modeling I – Optimization

3 cl hrs, 3 cr

The study of different types of optimization problems arising in different fields of business and industry. Examples are provided on sensitivity analysis of parameters of a model and calculating shadow prices.

Prerequisites: MAT 2580, MAT 2675, CST 1101

MAT 3772
Stochastic Models

3 cl hrs, 3 cr

The use of discrete and continuous distributions to construct deterministic and stochastic simulation models. Stochastic simulations may include Markov Processes, M/G/I Queuing Systems, Monte Carlo Simulation and Analytic Simulation.

Prerequisite: MAT 2572

MAT 3777
Applied Mathematics: Applications of the Wave Equations

3 cl hrs, 3 cr

The study of Laplace and Fourier transforms and their applications to analysis of continuous and discrete time signal processing. The sampling theorem and real-world digital-to-analog conversion.

Prerequisites: MAT 2580, MAT 2675

MAT 3787
Applied Mathematics – Finite Fields

3 cl hrs, 3 cr

The fundamentals of applied coding theory and various techniques in cryptography. Topics include: public-key cryptography, elliptic curves, digital signatures, error correcting codes and BCH codes.

Prerequisites: MAT 2580, MAT 2675, CST 2403

MAT 3788
Applications of the Heat Equation for Financial Mathematics

3 cl hrs, 3 cr

Focuses on the Black-Scholes Model. Includes risk measures in a portfolio of financial assets: The Greek Letters and Value at Risk. Computer models will be used.

Prerequisites: MAT 2630, MAT 2572, MAT 2675, CST 3503

MAT 3880
An Introduction to Partial Differential Equations

3 cl hrs, 0 lab hrs, 3 cr

An introduction to partial differential equations. Topics include: Fourier's method, separation of variables, partial differential equations in higher dimensions: 2D heat and wave equations, and partial differential equations in other coordinate systems.

Prerequisite(s): MAT 2675 and MAT 2680

MAT 4030
History of Mathematics

3 cl hrs, 0 lab hrs, 3 cr

The course examines the historical development of mathematical concepts from the origins of algebra and geometry in the ancient civilizations of Egypt and Mesopotamia

through the advent of demonstrative mathematics of ancient Greeks to the discovery of Calculus, non-Euclidian geometries, and formal mathematics in the 17th-20th century Europe. Topics include a historical examination of the development of number systems, methods of demonstration, geometry, number theory, algebra, Calculus, and non-Euclidean geometries.

Prerequisite: MAT 2071, MAT 3021

MAT 4050
Geometry II

3 cl hrs, 0 lab hrs, 3 cr

This course will cover Euclidean and hyperbolic geometry in two dimensions including group actions on these spaces by groups of transformations. The complex plane will be introduced in rectangular and polar coordinates and classical theorems of geometry will be covered in this setting.

Prerequisite: MAT 3050, MAT 3080

MAT 4672
Computational Statistics with Applications

2 cl hrs, 2 lab hrs, 3 cr

Topics include computer algorithms for evaluation, simulation, and visualization of data; sampling from prescribed distributions; robustness and error analysis of procedures used by statistical packages; graphics for data display; computation of probabilities and percentiles.

Prerequisite: MAT 3672

MAT 4788
Financial Risk Modeling

3 cl hrs, 0 lab hrs, 3 cr

This course aims to provide an overview of the main concepts underlying the analysis of financial risk and to show how these concepts can be implemented in practice. The topics that are covered include the Black-Scholes-Merton model and the Greeks, Numerical Procedures with Monte Carlo simulations, Estimating Volatilities and Correlations, Volatility Smiles, Value at Risk and Credit Risk. Computer models are used throughout the course.

Prerequisite: MAT 3788

MAT 4872
Probability and Mathematical Statistics III

4 cl hrs, 4 cr

The study of exponential distribution and reliability and failure rates. Hypo- and Hyperexponential, Erlang, Gamma and Weibull distributions. Expectation of multiple random variables and the computation of mean time failure. Transition probabilities and time birth-death process. Least squares curve fitting and analysis of variance.

Prerequisite: MAT 3672

MAT 4880
Mathematical Modeling II

3 cl hrs, 3 cr

The study of continuous-time and discrete-time nonlinear dynamic models. Provides examples of chaotic behavior of solutions of some dynamic models.

Prerequisite: MAT 3770

MAT 4900
Internship I

120 field hrs, 2 cr

This is part 1 of a two-semester sequence. Students will complete 120 hours within an internship program. A student log/journal will be kept. Employer's evaluation will indicate that the student is eligible for MAT 4901.

Prerequisite: Department approval

MAT 4901
Internship II

120 field hrs, 2 cr

This is part 2 of a two-semester sequence. Students will complete 120 hours after completing MAT 4900, within an internship program. A student log/journal will be kept. The employer's evaluation, the student's log/journal, a written report and an oral presentation will determine the course grade.

Prerequisite: Department approval

MEDU 1010
Foundations of Mathematics Education

3 cl hrs, 0 lab hours, 3 cr

This course examines the historical, philosophical, and sociological foundations underlying the development of American educational institutions. The role of the schools, the aims of education, diverse learners, the mathematics curriculum in New York State, legal principles that affect education, and the role of state, local, and federal agencies will be emphasized.

Prerequisite: CUNY proficiency in reading and writing

MEDU 1021
Teaching and Learning Strategies for Mathematics Teachers

2 cl hr, 2 lab hours, 3 cr

Students explore a wide variety of teaching and learning strategies used in mathematics. These strategies include oral and written communication, quantitative literacy, soft competencies, collaborative learning, critical thinking, library research and use of technology. Students will also explore theories of teaching and learning processes and motivation. Strategies to address students' learning difficulties in mathematics will be developed based on emotional intelligence,

learning styles and other theories. Active learning through the arts of observing, listening and questioning will be explored. Teacher candidates will examine ways in which students' previous knowledge can be used to stimulate intellectual curiosity.
Prerequisite: MAT 1375, CUNY proficiency in reading and writing
Equivalent to old course number MEDU 1020

MEDU 2010
Technology in Mathematics Education

1 cl hr, 2 lab hrs, 2 cr

Students examine the rationale and pedagogy for the effective use of technology in the middle and high school mathematics classrooms. The technologies considered may include graphing calculators, computer algebra systems, spreadsheets, and dynamic geometry software.

Prerequisite: MAT 1475, MEDU 1021

MEDU 2901
Peer Leader Training in Mathematics

1 cl hr, 0 lab hrs, 1 cr

This course trains students to be peer leaders for a mathematics workshop. Peer leaders learn to lead a group of students by focusing on communication, group dynamics, motivation, learning styles and other process issues, to help participants actively engage with course material. Reflective journals revealing the development of workshop practices will be required.

Prerequisite ENG 1101, MAT 1275

MEDU 3011
Methods of Teaching Middle School Mathematics

4 cl hrs (= 8 field hours/week),

0 lab hrs, 4 cr

Students will examine the development of curriculum for grades 7-9, aligning with state and national standards and incorporating appropriate teaching and learning strategies and assessment techniques. Focus will be on the needs of individual learners including English language learners and those with disabilities and special health needs, group instruction techniques, the development of literacy in the mathematics classroom, roles of the teacher in the classroom, and planning both curriculum and individual lessons. Includes 6 hours per week for 10 weeks of preservice field experience in middle schools.

Prerequisite: MEDU 1010; *Pre- or corequisite:* ENG 1121, MEDU 2010

MEDU 3020
Methods of Teaching
Secondary School
Mathematics

3 cl hrs (= 6 field hours/week),

0 lab hrs, 4 cr

Students will examine the development of curriculum for grades 10-12, aligning with state and national standards and incorporating appropriate teaching and learning strategies and assessment techniques. Focus will be on the needs of individual learners including English language learners and those with disabilities and special health needs, group instruction techniques, the development of literacy in the mathematics classroom, roles of the teacher in the classroom, and planning both curriculum and individual lessons. Includes 6 hours per week for 10 weeks of preservice field experience in high schools.

Pre- or corequisite: MEDU 3011

MEDU 3030
Assessment Techniques in
Mathematics

3 cl hrs, 0 lab hrs, 3 cr

Students will explore essential classroom assessment concepts and major assessment issues including those pertaining to district, state and national assessment. A variety of assessment techniques will be examined in theory and practice, including affective assessment, portfolio assessment, and formative and summative performance-based assessment. The distinction between assessment and evaluation will be discussed. Test and rubric construction, designing questions to promote thinking, and the role of standardized tests will also be included.

Pre- or corequisite: MEDU 3011

MEDU 4010
Supervised Student Teaching
and Seminar in Middle School
Mathematics

1 cl hr (= 9 field hours/week),

0 lab hrs, 3 cr

The course consists of a field-based, student teaching experience and a seminar component. The field-based experience involves 20 days or 120 hours of supervised student teaching in grades 7 through 9. Under the guidance and supervision of an experienced teacher and a faculty member, students will implement and refine pedagogical strategies, classroom management techniques, and assessment approaches. The seminar component provides a discussion forum for students, guided by a faculty member, to refine pedagogical strategies, and to address and resolve pedagogical issues that

students face during the concurrent field placement.

Prerequisite: MEDU 3011 and department permission (one semester in advance).

MEDU 4020
Supervised Student Teaching
and Seminar in Secondary
School Mathematics

1 cl hr (= 9 field hours/week),

0 lab hr, 3 cr

The course consists of a field-based, student teaching experience and a seminar component. The field-based experience involves 20 days or 120 hours of supervised student teaching in grades 10 through 12. Under the guidance and supervision of an experienced teacher and a faculty member, students will implement and refine pedagogical strategies, classroom management techniques, and assessment approaches. The seminar component provides a discussion forum for students, guided by a faculty member, to refine pedagogical strategies, and to address and resolve pedagogical issues that students face during the concurrent field placement.

Prerequisite: MEDU 3020 and department permission (one semester in advance).

MEDU 4040
Supervised Student Teaching
in Mathematics Education

3 cl hrs, 16 hrs field work/week, 9

credits

A field-based, student teaching experience with a seminar component. The field-based experience involves 20 days or 120 hours of supervised student teaching in grades 7 through 9; and 20 days or 120 hours of supervised student teaching in grades 10 through 12. Under the guidance and supervision of an experienced teacher and a faculty member, students implement and refine pedagogical strategies, classroom management techniques, and assessment approaches.

Prerequisite: MEDU 3020, MAT 2572, MAT 3075, MAT 3080, MAT 4050, and department approval is required one semester in advance; corequisite: EDU 4600

Physics

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PROGRAM:

Applied Computational Physics / BS

FACULTY:

Professors: Blake, Kezerashvili
Associate Professor: Acquaviva, Berman, Ferrogli, Gelman, Kolmakov,
Kostadinov, Leng, Maller, Ossola, Vazquez-Poritz
Assistant Professors: Krym, Mongroo

Senior CLT: Grace, Kiezik

PHYSICS

Physics is an essential component in the education of a scientifically literate individual in an advanced society. The study of physics gives the student an opportunity to learn the fundamental theories that will be needed to explore how the world functions as well as the discoveries behind technological advances.

The department offers courses in physics, astronomy and general science where students develop an appreciation and understanding of nature and the underlying laws which govern our universe. Coursework develops comprehension of basic physical principles, competence in using logical procedures in problem-solving and an awareness of historical advances and future potential in the field of science.

Courses offered in the department serve the needs of the entire College community. Specific courses are required in some degree programs. Students may use courses offered by the department to satisfy the general education science requirement or as electives. Students who have taken or are taking calculus are encouraged to take PHYS 1441 and PHYS 1442 rather than PHYS 1433 and PHYS 1434.

Bachelor of Science in APPLIED COMPUTATIONAL PHYSICS

The Applied Computational Physics degree program provides a more broad, balanced and flexible education than a traditional physics major. Combining computational elements alongside basic physical principles creates a mindset for modeling realistic systems. The course of study combines applied physics and high-performance computing to show complex laws of nature, physics methods and computational techniques within the context and application of different fields.

Graduates will be well equipped with a solid platform in physics, computing and mathematics, as well as valuable skills in complex

problem-solving and teamwork. This will position them to fulfill the growing need for researchers, educators, and information professionals in a wide variety of fields: including engineering areas such as aerospace, applied mathematics and computer science, physical chemistry, finance, biomedicine and environmental science, as well as research in academic, industrial or national laboratories.

Admissions Criteria

Students applying for admission must meet the college standards for admission into a baccalaureate program. High school coursework in physics will be helpful but is not required. Students who do not have the mathematics background required to enroll in MAT 1475 (Calculus I) but who meet other admission requirements can use the program elective credits to complete the pre-requisite courses.

Students transferring to the Applied Computational Physics program must have

- A minimum cumulative GPA of 2.5 or higher
- At least one semester of college-level English composition
- At least one semester of calculus (i.e. a course equivalent to MAT 1475)

Transfer students lacking any of these criteria must seek the approval of the Program Director. College coursework in physics will be useful for applicants but is not required for admission.

The program's curriculum is designed for students to achieve the following learning outcomes:

- The ability to clearly communicate complex scientific ideas both verbally and in written form
- An appreciation of how the scientific method is built upon testable hypotheses and experimental evidence
- A concrete foundation in basic physics, including mechanics, electromagnetism, quantum mechanics and thermodynamics
- The ability to develop a set of mathematical, problem-solving, and computer programming skills
- The ability to model and simulate a large number of different types of physical systems and formulate predictions using semi-analytical and computational techniques and data analysis
- An awareness of the underlying assumptions and limitations of various approximation schemes and certain computational algorithms
- The ability to identify and apply research ethics and unbiased assessment in gathering and reporting scientific data and in the analyses of results of modeling and simulations
- An awareness of the ethical, societal, legal and other personal aspects of being a professional.

DEGREE REQUIREMENTS

GENERAL EDUCATION COMMON CORE **42 CREDITS**

I – REQUIRED CORE¹ (4 COURSES, 12 CREDITS)

English (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 3 credits)

Any approved course (STEM math strongly recommended) ¹		3
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Life and Physical Sciences (1 course, 3 credits)

Any approved course		3
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II – FLEXIBLE CORE (6 COURSES, 18 CREDITS)		
From the list of approved courses select one course from each of the following areas; no more than two courses may be selected from any discipline.		
World Cultures and Global Issues		
Any approved course	3	
US Experience in its Diversity		
Any approved course	3	
Individual and Society		
Any approved course	3	
Creative Expression		
Any approved course	3	
Scientific World		
Any approved course	3	
One additional course from any group	3	
III – COLLEGE OPTION REQUIREMENT² (12 CREDITS)		
• One course in Speech/Oral Communication		
COM 1330 Public Speaking or higher ³	3	
• One interdisciplinary Liberal Arts and Sciences course	3	
• Additional Liberal Arts credits	6	
In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language		
Writing Intensive Requirement		
Students at New York City College of Technology must complete four courses designated WI for the associate level, two from GenEd and two from the major.		
PROGRAM-SPECIFIC DEGREE REQUIREMENTS AND ELECTIVES		78
Computer Science Requirements		9
CST 1101 Problem Solving with Computer Programming	3	
CST 1201 Programming Fundamentals	3	
CST 1204 Database Systems Fundamentals	3	
General Physics Requirements		25
PHYS 1441 General Physics I: Calculus based	5	
PHYS 1442 General Physics II: Calculus based	5	
PHYS 2443 Modern Physics	4	
PHYS 2607 Introduction to Quantum Mechanics	3	
PHYS 3100 Classical Mechanics	4	
PHYS 3200 Electricity and Magnetism	4	
Applied Computational Physics (ACP) Requirements		16
PHYS 3300 Computational Fluid Dynamics	3	
PHYS 3600 Machine Learning for Physics and Astronomy	3	
PHYS 4100 Computational Methods	4	
PHYS 4150 Computational Methods Laboratory	2	
PHYS 4200 Internship/Real Research Experience	4	

Mathematics Requirements		19
MAT 1475	Calculus I	4
MAT 1575	Calculus II	4
MAT 2675	Calculus III	4
MAT 2580	Linear Algebra	3
MAT 2572	Probability and Mathematical Statistics I	4
Program Electives⁴		9
Elective courses provide the freedom to adapt the curriculum to the specific interests and previous curriculum choices of each individual student. Students are encouraged to discuss the selection of elective courses with the Program Director.		
TOTAL GENERAL EDUCATION COMMON CORE CREDITS		42
TOTAL REQUIRED AND ELECTIVE CREDITS		78
TOTAL CREDITS FOR DEGREE		120
¹ Applied Computational Physics is a STEM degree program, requiring 4 or 5 credit courses in mathematics and sciences. Student may elect to use their required 4 or 5 credit mathematics or science courses to meet Common Core requirements in “Mathematical and Quantitative Reasoning” and “Life and Physical Sciences.” Note also that other science courses are identified as satisfying “Scientific World” courses in the Flexible Core. This “double duty” use of courses is encouraged, as the number of free elective credits will increase accordingly, allowing more flexibility in advanced elective choices.		
² Complete lists of liberal arts and sciences courses and advanced liberal arts courses, as well as semester-specific lists of interdisciplinary courses and writing intensive courses, are available online at the City Tech Pathways website .		
³ Students who have already met this requirement may choose any other liberal arts and science course in its place.		
⁴ Students who need to complete MAT 1275 and MAT 1375 before beginning the calculus-based classes required by the program may use these credits to do so within the 120-credit count for the degree.		

Option in Physics

Add a specialty to your associate degree in Liberal Arts and Sciences with an option in Physics. An option is an area of concentrated study in an associate degree program. This option will enable the student to develop a deeper understanding of physics.

Physics Option Requirements

To satisfy the PHYS Option, select Calculus-Based Physics as one of your science sequences, and two additional physics classes from the list below when choosing your electives.

REQUIRED COURSES IN THE MAJOR		CREDITS
PHYS 1441	General Physics I: Calculus Based	5
PHYS 1442	General Physics II: Calculus Based	5
Choose two of the following courses:		
PHYS 1117	Astronomy I	4
PHYS 1118	Astronomy II: Stars, Galaxies, Cosmology	4
PHYS 2443	Modern Physics	4
PHYS 2605	Introduction to Laser Physics and Photonics	4
TOTAL CREDITS REQUIRED FOR THE OPTION		18

COURSES:

PHYS 1000

The Physical Universe

Pathways: Life and Physical Sciences

3 cl hrs, 3 cr

This course is designed to introduce the physical concepts that explain the workings of the universe to non-science majors. The use of mathematics is limited and subordinate to the physical concepts being addressed. Examples from daily life are used to both illustrate the physical concepts and make them relevant to students. Laboratory exercises are performed in the classroom to explain the scientific method and to allow students to learn how to perform experiments and compose a lab report.

Pre- or corequisite: MAT 1175 or higher

PHYS 1002ID

Introduction to the Physics of Natural Disasters

College Option: Interdisciplinary

3 cl hrs, 1 lab hr, 3 cr

A course for non-science majors that focuses on natural disasters and the dynamic Earth processes that control them. It integrates the principles of geology, meteorology, climatology, oceanography, and astronomy to provide rudimentary understanding of geophysics. Students learn about the nature, causes, risks, impacts, and prediction of natural disasters including hurricanes, earthquakes, volcanoes, tsunamis, and climate change. Laboratory exercises are incorporated with class work to illustrate and supplement the lecture material.

Pre- or corequisite: MAT 1180 or MAT 1190 or higher

PHYS 1010ID

Science in the Kitchen

College Option: Interdisciplinary

3 cl hrs, 1 lab hr, 3 cr

An introduction to the scientific concepts behind food cooking processes. Emphasis is given to general concepts and qualitative description. Laboratory work complements the course to show the scientific concepts in action in the kitchen. Laboratory exercises explain the scientific method and teach students how to perform experiments and compose a lab report.

Prerequisite: MAT 1190 or higher

PHYS 1111

Principles of Science I

Pathways: Life and Physical Sciences, Scientific World

3 cl hrs, 2 lab hrs, 4 cr

Conceptual physics for non-science students. Topics include: Newton's laws of motion and law of universal gravity,

heat and temperature, electricity and magnetism, light, relativity and elements of modern physics. Special emphasis is placed upon scientific principles with applications taken from everyday experiences. Laboratory work illustrates and supplements the lecture material.

Prerequisites: CUNY proficiency in reading and writing; Pre- or corequisite: MAT 1175 or higher

PHYS 1112

Principles of Science II

Pathways: Scientific World

3 cl hrs, 2 lab hrs, 4 cr

A study of physical science as related to humans and society. Topics include: earth sciences, the solar system, physical chemistry, geology, oceanography, the water cycle and global warming.

Prerequisite: PHYS 1111

PHYS 1117

Astronomy I

Pathways: Life and Physical Sciences, Scientific World

3 cl hrs, 2 lab hrs, 4 cr

Astronomical history is presented including an introduction to the mechanics and optics of Galileo and Newton. Radiation laws and astronomical tools including the telescope are considered. The solar system is presented in detail as is a history of human space travel.

Prerequisite: Proficiency in reading and writing; Pre- or corequisite: MAT 1175 or higher

PHYS 1118

Astronomy II: Stars, Galaxies, Cosmology

Pathways: Scientific World

3 cl hrs, 2 lab hrs, 4 cr

Stellar astrophysics is considered including star formation, planetary systems formation; and star properties, groupings and evolution. Galaxy properties and evolution are discussed. Following an introduction to relativity, aspects of quantum mechanics and cosmology are introduced. The search for and consequences of extraterrestrial life are considered. Laboratory experiments supplement and illustrate lecture material.

Pre- or corequisite: PHYS 1117

PHYS 1420

Principles of Physics

3 cl hrs, 2 lab hrs, 4 cr

Basic concepts and principles of mechanics, heat, electricity, magnetism and optics. Laboratory work illustrates and supplements the lecture material. Laboratory

experiments are computer-based and illustrate and supplement the lecture material. This course is open to the Verizon program only.

Prerequisite: MAT 1275 or equivalent

PHYS 1422

Foundations of Physics

3 cl hrs, 2 lab hrs, 4 cr

A study of the basic principles of mechanics, thermodynamics, fluid dynamics, electromagnetism, optics, and elements of modern physics, designed for health science students. Laboratory, lecture and homework assignments will illustrate the applications of physical principles presented in class to muscle movements, blood flow, hearing, vision and medical applications of radiation technology. Knowledge of elementary algebra is assumed.

Prerequisite: MAT 1175, MAT 1180 or MAT 1190 or higher

PHYS 1433

General Physics I: Algebra Based

Pathways: Life and Physical Sciences, Scientific World

4 cl hrs, 2 lab hrs, 4 cr

Algebra-based course on basic concepts and principles of mechanics, heat, waves and fluids. Topics include: statics, kinematics, dynamics, work and energy, circular and rotational motion, fluid dynamics, temperature, heat transfer and wave motion. Laboratory experiments are computer-based and illustrate and supplement the lecture material.

Pre- or corequisite: MAT 1275 or equivalent

PHYS 1434

General Physics II: Algebra Based

Pathways: Scientific World

4 cl hrs, 2 lab hrs, 4 cr

Algebra-based course on basic concepts and principles of electricity and magnetism, light and atomic physics. Topics include: electrostatics, electric current, magnetism, magnetic induction, alternating currents, electromagnetic waves, geometric and wave optics and the atomic theory of matter. Laboratory experiments illustrate and supplement the lecture material.

Prerequisite: PHYS 1433

PHYS 1441

General Physics I: Calculus Based

Pathways: Life and Physical Sciences, Scientific World

4 cl hrs, 3 lab hrs, 5 cr

Basic concepts and principles of mechanics, heat and mechanical waves. Topics include: kinematics,

dynamics, statics, work and energy, rotational motion, oscillations and wave motion, fluids, temperature, heat and concepts of thermodynamics. Calculus and vector methods are used throughout the course. Laboratory experiments are computer-based and illustrate and supplement the lecture material.

Pre- or corequisite: MAT 1475 or higher

PHYS 1442

General Physics II: Calculus Based

Pathways: Scientific World

4 cl hrs, 3 lab hrs, 5 cr

A continuation of PHYS 1441. Electricity and magnetism, optics and elements of modern physics. Topics include: electrostatics, electric current and electric circuits, magnetism, electromagnetic induction, alternating current circuits, electromagnetic waves, geometric optics, optical instruments, spectra and physical optics. Calculus and vector methods are used throughout the course. Laboratory experiments are computer-based and illustrate and supplement the lecture material.

Prerequisite: PHYS 1441

PHYS 2443

Modern Physics

Pathways: Scientific World

Writing Intensive

3 cl hrs, 3 lab hrs, 4 cr

Selected topics in physics and modern physics including: light, wave optics, interference, diffraction and polarization of light, relativity, origins of the quantum theory, atoms, the nucleus, elements of condensed matter, lasers, holography, elements of elementary particle physics and astrophysics. Laboratory experiments are computer-based and illustrate and supplement the lecture material.

Prerequisite: PHYS 1442

PHYS 2601

Introduction to Research

2 cl hrs, 3 lab hrs, 3 cr

A study of the theoretical and practical application of some basic techniques used in research in the physical sciences. Emphasis is placed on an appreciation for the entire process of scientific practice from proposal through experimentation including poster and oral presentations, to writing a final paper. Includes computer modeling and simulations.

Prerequisites: MAT 1375 or higher, ENG 1101 and one semester of a college science course

PHYS 2603
Physical Principles of Medical Imaging

2 cl hrs, 2 lab hrs, 3 cr

An introduction to principles and methods of medical imaging. The course focuses on ultrasound, x-ray and magnetic resonance imaging modalities. The physical characteristics and parameters of sound and electromagnetic waves are discussed. Interaction of ultrasound and x-ray radiation with matter relevant for image formations and acquisitions is considered. Underlying principles of magnetic resonance imaging (MRI) are discussed. Introduction to tomographic imaging techniques such as computed tomography (CT-scan) is provided. The course is a combination of lectures and demonstrations and includes a laboratory component.

Prerequisite: PHYS 1433 or PHYS 1441 or RAD 2326

PHYS 2605
Introduction to Laser Physics and Photonics

Pathways: Scientific World

3 cl hrs, 3 lab hrs, 4 cr

This course offers a study of the physical principles of lasers and photonics. It starts with an overview of geometrical and physical optics, and introduces students to concepts and processes of important parts of modern physics including optical coherence, stimulated emission, laser oscillation, quantum optics, principles of fiber optics and photonics. The laboratory component of this course offers students extensive hands-on practice and exposure to modern equipment and technologies in photonics.

Pre- or corequisite: PHYS 1434 or PHYS 1442

PHYS 2607
Introduction to Quantum Mechanics

3 cl hrs, 3 cr

An introduction to foundations, mathematical formalism and applications of quantum physics is presented. The origin of quantum theory–Planck's law for the black-body radiation, the photoelectric and Compton effects and the wave-particle duality—are discussed. The principle of superposition and the Heisenberg uncertainty principle are formulated. The probability interpretation of the quantum mechanical wave function is given. The Schrodinger equation is studied and applied to simple systems. Quantization of orbital and spin angular momentum is presented. The Pauli exclusion principle is formulated. The hydrogen atom is treated.

Applications to multi-electron atoms and solids are discussed. Basics of linear operators, matrices and vector spaces are introduced.

Prerequisite: PHYS 1442

PHYS 2609
Introduction to Quantum Computing

4 cl hrs, 4 cr

The course provides an introduction to the field of quantum computing. While very much a technology of the future, the course will examine some of the possibilities that the quantum world offers in advancing the capabilities of computers and how our notion of information has evolved. Topics covered include elements of Boolean algebra and classical logic gates, qubits and hypothesis of quantum mechanics, introduction to quantum algorithms, quantum teleportation and its application, quantum entanglement, statistical and adiabatic quantum computation, physical realizations of logic quantum gates in quantum system.

Pre- or corequisites: PHYS 2443 or PHYS 2607

PHYS 3100
Classical Mechanics

4 cl hrs, 4 cr

The course is devoted to the study of Lagrangian and Hamiltonian methods. Topics include a review of Newtonian mechanics and the principle of conservation of energy and momentum, as well as the study of calculus of variations, Lagrange's equations, two bodies central force problems, mechanics in non-inertial frames, rigid bodies, Hamiltonian mechanics, collision theory and special relativity.

Prerequisites: PHYS 1442, MAT 1575

PHYS 3200
Electricity and Magnetism

4 cl hrs, 4 cr

An introduction to electrodynamics with applications to physical problems. Topics include electrostatics, magnetostatics, Maxwell's equations, electromagnetic forces, electromagnetic waves, radiation from accelerating charges and currents and special relativity.

Prerequisites: PHYS 1442, MAT 1575

PHYS 3300
Computational Fluid Dynamics

2 cl hrs, 2 lab hrs, 3 cr

An introduction to computational fluid dynamics. Topics include the formalism of continuum mechanics, the conservation of mass, energy and momentum in a fluid, the Euler and

Navier-Stokes equations, viscosity, vorticity and fluid instabilities. Numerical calculations, Monte Carlo techniques and numerical simulation are used to solve problems.

Prerequisites: CST 1201 or equivalent, PHYS 3100

PHYS 3400
Advanced Quantum Mechanics

3 cl hrs, 3 cr

Topics in this course include the wave function and its probabilistic interpretation, the uncertainty principle, the Schrodinger equation and its solutions, the Hydrogen atom, angular momentum and spin, identical particles, approximation techniques and the theory of scattering.

Prerequisites: PHYS 2443 or PHYS 2607, MAT 2572

PHYS 3500
Statistical Physics and Thermodynamics

3 cl hrs, 3 cr

This course is devoted to the study of systems made of a large number of particles, an area of thermal physics and statistical mechanics which governs transformations of heat into mechanical work, phase transitions, properties of gases and solids and many other fundamental phenomena.

Prerequisites: PHYS 2443 or PHYS 2607, MAT 2572

PHYS 3600
Machine Learning for Physics and Astronomy

2 cl hrs, 2 lab hrs, 3 cr

Problem solving in physics and astronomy through statistical inference, machine learning algorithms and data mining techniques. Researching and solving problems in different areas of physics using tools such as Bayesian statistics, Monte Carlo sampling, regression and classification algorithms, dimensionality reduction and data cleaning data. Programming assignments use current, flexible languages, such as Python.

Prerequisites: CST 1201 or equivalent, MAT 1272 or MAT1372 or MAT 2572 or permission

PHYS 4100
Computational Methods

4 cl hrs, 4 cr

This course provides a basic understanding of computer modeling in physics. Topics include basics of python programming language; scientific plotting; numerical evaluation of integrals; numerical solution of ordinary

and partial differential equations; visual programming; basics of high performance and parallel computing; basics of graphics processing unit programming.

Prerequisites: PHYS 2443, CST 1201

PHYS 4150
Computational Methods Laboratory

4 lab hrs, 2 cr

This course provides practical training in computer modeling in physics. Topics include basics of python programming language; scientific plotting; numerical evaluation of integrals; numerical solution of ordinary and partial differential equations; visual programming; basics of high performance and parallel computing; basics of graphics processing unit programming.

Pre- or corequisite: PHYS 4100

PHYS 4200
Physics Internship/Real Research Experience

160 field hours, 4 cr

This internship/research course provides a hands-on experience in applying the skills acquired in the academic courses in a real professional environment. For students who wish to apply for graduate programs, the internship can be replaced with a real research experience within a research group selected by the student and a career mentor within the department.

Prerequisite: Departmental approval

SCI 1000
Introduction to Mathematics and Science Technologies

2 cl hrs, 3 lab hrs, 3 cr

This interdisciplinary course introduces the student to basic concepts and career options in Physics, Biological Sciences, Chemistry and Mathematics. Hands-on skills in these areas are developed, and students apply these skills in a group setting to find creative solutions to problems. Strategies to succeed in college, to cultivate leadership skills and to communicate effectively, both orally and in writing, are emphasized.

Pre- or corequisite: CUNY proficiency in mathematics

Social Science

Professor Peter Parides, Chair
Namm Hall, room N 611
718.260.5080
email: pparides@citytech.cuny.edu

FACULTY:

Professors: Cuordileone, Derringham, Nalven, Panayotakis
Associate Professors: Castillo, Catapano, Her, MacDonald, Pagano,
Parides, Pope Fischer, Park, Pourshariati, Rodriguez, Sisco, Zylstra
Assistant Professors: Almond, Bayaz Ozturk, Boyle, Capruso, Hannum,
Hillstrom, Kao, MacDougall, Mincyte, Nyambuu, Parnes

SOCIAL SCIENCE

The Department of Social Science offers courses in anthropology, economics, geography, government, history, philosophy, psychology and sociology. Students do not apply for admission to the Social Science department. The courses in the department are part of degree-granting programs. They also satisfy requirements for general education. Students should be guided in selecting courses in the department by the statement of requirements for the specific programs in which they are enrolled.

COURSES:

ANTH 1101 Introductory Anthropology

Pathways: World Cultures and
Global Issues

3 cl hrs, 3 cr

Physical and cultural components of humanity's evolution. Included are discussions of cultural universals such as marriage, religion, kinships and economic and political systems. Ethnographic data from Africa, Mesoamerica, Australia and Asia are presented.

Prerequisite: CUNY proficiency in reading and writing

ANTH 1102 Magic, Witchcraft, and Religion

Pathways: World Cultures and
Global Issues

3 cl hrs, 3 cr

Focuses on myth and ritual as component parts of religious systems. Also deals with religion and magic, healing and religious practitioners. Students must be prepared to look at both literate and pre-literate ritual systems. Non-Western systems are contrasted with religions of the Western world. Cross-cultural analysis of structures, forms and functions, and philosophies of religions in their cultural contexts are included.

Prerequisite: CUNY proficiency in reading and writing

ANTH 1103 Gender, Culture and Society

Pathways: World Cultures and
Global Issues

3 cl hrs, 3 cr

Female development from a historical, economic, sociological, psychological and anthropological perspective. Focus is on readings and research concerning women with an analytical emphasis on biological versus cultural orientations in the literature.

Prerequisite: CUNY proficiency in reading and writing

ANTH 2000 Medical Anthropology

Pathways: World Cultures and
Global Issues

3 cl hrs, 3 cr

Examines how anthropologists study the understanding of disease, health, and healing from a global perspective. Topics include Healers and Healing, Social Inequality and Health Disparities, Globalization, Biocultural, Cultural and Applied Anthropological approaches.

Prerequisite: ENG 1101 and any anthropology course

The mission of the department of Social Science is to stimulate intellectual curiosity and critical thinking skills by studying the social scientist's view of problems which confront the individual, the community, the nation and the world. Students are encouraged to discuss, question and debate the ideas and theories they encounter in various Social Science disciplines, and to form conclusions through careful reading and critical analysis of evidence. In doing so they will develop a deeper understanding of the complexity of society and of the many demands it makes on each of us as well as our communities. By gaining insight into the ways in which social scientists analyze the world and the intricate relationships that govern it, the student can ultimately step with confidence into the responsibilities of citizenship and enhance intellectual and personal growth in his/her chosen career.

ECON 1100 Consumer Economics

3 cl hrs, 3 cr

Consumers play a central role in market economies. The course looks at that role by examining consumer purchasing decisions. Topics include owning vs. renting, borrowing, saving, investing, financing, credit cards, conspicuous consumption, advertising and consumer law. While learning how to make informed purchasing decisions, students also gain an understanding of fundamental economic concepts.

Prerequisite: None; Note: This course may not be taken for degree requirements by students in the AA and AS programs.

ECON 1101 Macroeconomics

Pathways: US Experience in Its
Diversity

3 cl hrs, 3 cr

Fundamental economic ideas and the operation of the economy on a national scale. Production, distribution and consumption of goods and services, the exchange process, the role of government, the national income and its distribution, GDP, consumption function, savings function, investment spending, the

multiplier principle and the influence of government spending on income and output. Analysis of monetary policy including the banking system and the Federal Reserve System.
Prerequisite: CUNY proficiency in reading and writing

ECON 1401 Microeconomics

Pathways: Individual and Society

3 cl hrs, 3 cr

The price system and capitalism. Demand, supply and elasticity, the costs of production and how these costs are determined under perfect competition, monopoly, monopolistic competition and oligopoly, factors of production under perfect competition and the various forms of monopoly.
Prerequisite: CUNY proficiency in reading and writing

ECON 2301 Money and Banking

3 cl hrs, 3 cr

The importance of money and banking to economic activity on the national and international level. The definition of money and the different financial institutions that help circulate money through the system. Deposit creation, a brief history of the banking system in the U.S. prior

to the creation of the Federal Reserve system, and a detailed study of the Federal Reserve banking system. The relationship between money and banking in international trade and finance.

Prerequisite: ECON 1101 or ECON 1401

ECON 2403
Labor Management Relations
Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

Economic and social problems relating to the labor management field. Development and functions of labor and employer organizations, regulatory law and protective labor legislation, collective bargaining and dispute settlement, the laws on wages, hours, working conditions, social security, elimination of discrimination and health hazards.

Prerequisite: ECON 1101

ECON 2505
Environmental Economics
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

This course examines current environmental issues from a macroeconomic perspective, focusing on both the long- and short-term economic viability of various proposals to address current environmental challenges. Traditional goals of economic efficiency are examined in the context of the need to expand renewable energy sources, green design, sustainable construction and resource allocation and other efforts to combat climate change on a global scale.

Prerequisite: ECON 1101 or ECON 1401

ECON 2505ID
Environmental Economics
Pathways: World Cultures and Global Issues

College Option: Interdisciplinary

3 cl hrs, 3 cr

This course examines current environmental issues from a macroeconomic perspective, focusing on both the long- and short-term economic viability of various proposals to address current environmental challenges. Traditional goals of economic efficiency are examined in the context of the need to expand renewable energy sources, green design, sustainable construction and resource allocation and other efforts to combat climate change on a global scale.

Prerequisite: ECON 1101 or ECON 1401

ECON 2705/HIS 2705
US Economic History

3 cl hrs, 3 cr

An examination of American economic history from the Industrial Revolution to the present. The evolution and influence of agriculture, trade, manufacturing, the banking system, transportation, immigration, labor unions, wars and recessions, and depressions and inflation are all examined as central to the dynamics of economic and social change.

Prerequisite: Any one of the following: ECON 1101; ECON 1401; HIS 1110; HIS 1111

ECON 2820ID
Behavioral Economics
College Option: Interdisciplinary

3 cl hrs, 3 cr

This interdisciplinary course examines the factors that underlie the judgment/decision making processes of economic agents. Behavioral economics challenges the rationality assumption of standard economic theory and encompasses the role of emotion, psychological biases and heuristics to understand non-rational decision making.

Prerequisites: (ECON 1101 or ECON 1401); MAT 1275 or higher; PSY 1101

GEOG 1101
Elements of Physical Geography

Pathways: Scientific World

3 cl hrs, 3 cr

A survey of key elements of physical geography presented in the context of human activity and its relation to the physical world. Topics include world surface features, climate and weather, the seas, and natural resources.

Prerequisite: CUNY proficiency in reading and writing

GOV 1101
American Government
Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

An overview of the structure and characteristics of the American political system. Topics include the branches of government, the Constitution and civil liberties, political parties, interest groups, citizen participation, and the relationship between the national and state governments.

Prerequisite: CUNY proficiency in reading and writing

GOV 1102
State and Local Government
Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

A contemporary perspective on the powers and responsibilities of the various branches of state and local government. This course will also focus on the issue of federalism and the various ways that state and local governments both cooperate and come into conflict with the national government. Special emphasis is placed on New York City and State government.

Prerequisite: CUNY proficiency in reading and writing

GOV 2401
US Constitutional Law

3 cl hrs, 3 cr

An examination of the U.S. Constitution's structure and the Supreme Court's evolving interpretations of its meaning and authority. The course is taught using the technique of analyzing case law briefs.

Prerequisite: GOV 1101 or GOV 1102 or LAW 1201

GOV 2402
Public Policy
Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

An introduction to public policymaking in the United States. This course provides students with a critical view of how public policy is formulated in the United States through a topical examination of important public policy issues. The course is divided into three sections: 1) theoretical frameworks of public policy, 2) understanding the policy-making process, and 3) current issues in U.S. public policy.

Prerequisite: GOV 1101 or GOV 1102

HIS 1101
The Origins of Western Civilization

Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

A survey of Western civilization from the dawn of human civilization to the eve of the Renaissance, emphasizing the following events: the ancient civilizations of Mesopotamia, Egypt, Greece, and Rome; the rise of Judaism, Christianity and Islam; Western Europe in the Middle Ages; feudalism, the medieval worldview, the Crusades and the crises of the late middle ages.

Prerequisite: CUNY proficiency in reading and writing

HIS 1102
Foundations of the Modern World, 1400-1900

Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

A chronological and thematic introduction to the history of European interaction with the wider world from the 1400s to the end of the 1800s. The course focuses on the central themes of global interconnectivity and discussions of nationalism, capitalism, colonialism, slavery and trade

Prerequisite: CUNY proficiency in reading and writing

HIS 1103
The Modern World Since 1900
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

A chronological and thematic introduction to the history of Western interactions with the wider world from the late 1800s to the present. The course focuses on the central themes of global interconnectivity and discussions of nationalism, war, ideological conflict, and globalization.

Prerequisite: CUNY proficiency in reading and writing

HIS 1110
US History to 1865
Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

A survey of American history from Native American inhabitation to the Civil War. Topics include the European colonization of the New World and the origins of African slavery, the causes and consequences of the American Revolution, the formation of the republic, the market revolution of the 19th century, westward expansion, the evolution of sectional conflict and the Civil War.

Prerequisite: CUNY proficiency in reading and writing

HIS 1111
US History Since 1865
Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

A survey of U.S. history from Reconstruction to the present. Topics include Reconstruction, industrialization, urbanization and immigration, American expansion abroad, the world wars and the rise of the United States as a global power, the New Deal and the growth of the federal government, the Cold War and Civil Rights movement, and post-Cold war America.

Prerequisite: CUNY proficiency in reading and writing

HIS 1201
Contemporary Civilizations of Asia

3 cl hrs, 3 cr

An examination of the peoples of Asia, focusing on the economic, political, social, and cultural characteristics of Asia. Emphasis is placed on the relationship between Asia and the West.

Prerequisite: CUNY proficiency in reading and writing

HIS 1204/ARTH 1204
20th Century Dress and Culture

3 cl hrs, 3 cr

A survey of fashion history, from the end of the 19th century to the present. It offers an overview of the many influences that have affected the development of clothing. Studies the effect of an historical period on the clothing of the time through analysis of its economics, politics, religion and culture. Issues affecting the industry are explored through readings, videos, discussions and links to local industry are made through field trips and guest speakers.

Prerequisite: ENG 1101

HIS 1501
The Origins of Islamic Civilization

Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

A survey of the origins of Islamic civilization in a global context. By examining the life of the Prophet Muhammad, the period of the Rightly Guided Caliphs, the Arab conquest of the Middle East, the Umayyad and Abbasid Caliphates, as well as the scientific, literary and artistic achievements of Muslims, this course discusses the contribution of Islamic civilization to the development of human society.

Prerequisite: CUNY proficiency in reading and writing

HIS 1503
The Modern Middle East and North Africa

Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

An introduction to the history of the Modern Middle East and North Africa from the 18th century to the present. Major themes in this course are colonialism, empire, gender, class, religion, sectarianism and contemporary revolution.

Prerequisite: CUNY proficiency in reading and writing

HIS 2000
Modern World History
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

An examination of modern world history circa. 1848 to the present in a global context. Topics covered range from the 19th century race for empire to contemporary debates about globalization. Emphasis is placed on examining the interconnectedness of the political, diplomatic, economic, social, and cultural forces that shaped the formation of the modern world.

Prerequisite: ENG 1101

HIS 2405
History of Foodways in America

Pathways: US Experience in its Diversity

3 cl hrs, 3 cr

The course traces the historical development and social dynamics of food production, distribution, preparation, and consumption in America from the pre-colonial period to the present. This course provides an understanding of the evolution of the American palate from economic, social, cultural and political perspectives.

Prerequisites: ENG 1101 and a previous history course (HIS 1000 series, AFR 1460, AFR 1461, AFR 1465, AFR 1466, or LATS 1462)

HIS 2705/ECON 2705
US Economic History

3 cl hrs, 3 cr

An examination of American economic history from the Industrial Revolution to the present. The evolution and influence of agriculture, trade, manufacturing, the banking system, transportation, communication, technological change, immigration, labor unions, wars and recessions, and depressions and inflation are all examined as central to the dynamics of economic and social change.

Prerequisite: Any one of the following: ECON 1101; ECON 1401; HIS 1110; HIS 1111

HIS 3208
US Immigration History
Pathways: US Experience in its Diversity

3 cl hrs, 3 cr

An examination of American immigration from the colonial period to the present. Emphasis is placed on examining the way race, ethnicity, class, gender and religion have shaped the lives of immigrants and their communities.

Prerequisite: ENG 1101 and a previous history CORE course (which includes HIS 1000 series or AFR 1460 or AFR 1461 or AFR 1465 or AFR 1466 or LATS 1462)

HIS 3209
History of Technology
Pathways: US Experience in its Diversity

3 cl hrs, 3 cr

An examination of technology in North America from Native American inhabitation to the present. Focusing on the relationship between technology and cultural value systems, this course addresses the historical development of our current technological society. Topics include the relationship of technological change to class, gender and racial divisions, the creation of large-scale technological systems, and ethical debates regarding the appropriate use of technology.

Prerequisite: ENG 1101 and a previous history CORE course (which includes HIS 1000 series or AFR 1460 or AFR 1461 or AFR 1465 or AFR 1466 or LATS 1462)

HIS 3310
Environmental History of North America

Pathways: US Experience in its Diversity

3 cl hrs, 0 lab hrs, 3 cr

This course looks at the role of nature in the unfolding of American history from prehistory to the present. Focusing on both human-induced environmental change and nature's impact on human development, we will examine large-scale changes in the earth's environmental systems that have accompanied historical changes in culture, society, economics, politics, and technology.

Prerequisites: English 1101 and one previous history class from HIS, AFR, LATS, or ARCH 2321 or ARCH 3551

HIS 3402
Topics in Modern World History, 1945-Present
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

A seminar-based exploration of selected topics in modern world history from 1945 to the present. Students in this course are expected to keep abreast of current trends in various parts of the world and to be familiar with popular sources of information. The topic for each section will be selected by the instructor.

Prerequisite: ENG 1101 and a previous history CORE course (which includes HIS 1000 series or AFR 1460 or AFR 1461 or AFR 1465 or AFR 1466 or LATS 1462)

HIS 3402ID
Topics in Modern World History, 1945-Present
Pathways: World Cultures and Global Issues

College Option: Interdisciplinary
3 cl hrs, 3 cr

A seminar-based exploration of selected topics in modern world history from 1945 to the present. Students in this course are expected to keep abreast of current trends in various parts of the world and to be familiar with popular sources of information. The topic for each section will be selected by the instructor.

Prerequisite: ENG 1101 and a previous history CORE course (which includes HIS 1000 series or AFR 1460 or AFR 1461 or AFR 1465 or AFR 1466 or LATS 1462)

PHIL 2101
Introduction to Philosophy
Pathways: Individual and Society

3 cl hrs, 3 cr

Philosophy as the rational analysis and justification of basic cultural beliefs about religion, politics, morality, knowledge, art, technology, etc. Students are encouraged to formulate and defend their views.

Prerequisite: ENG 1101

PHIL 2102
Logical Thinking

3 cl hrs, 3 cr

Development of critical thinking skills. Topics include structure of arguments, nature of an inference, types of inductive and deductive arguments, common fallacies and other errors and deceptions in reasoning.

Prerequisite: ENG 1101

PHIL 2103
Ethics
Pathways: Individual and Society

3 cl hrs, 3 cr

An examination of the major ethical theories on what is morally right and wrong, and the meaning of moral concepts (e.g., the concepts of moral obligation, right, duty). Focus is upon ethical problems such as capital punishment, aid to the needy, treatment of animals and plants, etc.

Prerequisite: ENG 1101

PHIL 2104
Ancient Philosophy
Pathways: Individual and Society

3 cl hrs, 3 cr

The history of philosophy from ancient to medieval times: Pre-Socratics to St. Thomas Aquinas.

Prerequisite: ENG 1101

PHIL 2105
Modern Philosophy

3 cl hrs, 3 cr

The history of modern philosophy from the seventh century to this century; rationalism, empiricism, idealism, pragmatism and more recent movements including figures such as Descartes, Locke, Hegel and Dewey.
Prerequisite: ENG 1101

PHIL 2106
Philosophy of Technology
Pathways: Individual and Society

3 cl hrs, 3 cr

A philosophical evaluation of the goals, methods, standards and values of technology. How technology has altered the quality of human life. Ethical and political implication of technology. Its role in work, leisure, power and ecology. Whether technology is a threat to freedom, religion, imagination and nature or a constructive force in promoting equality, democracy, rational thinking and economic progress.
Prerequisite: ENG 1101

PHIL 2107
Philosophy and Women
Pathways: Individual and Society

3 cl hrs, 3 cr

A study of the views of major philosophers from classical to modern times on the nature of women and their role in society, on sexual equality and sexual morality. Feminist theories and their practical implications.
Prerequisite: ENG 1101

PHIL 2114
Business Ethics in a Global Context

Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

Considers the purpose of business; evaluates ethical theories; assesses the implications of globalization for ethical business; analyzes landmark international cases of business wrongdoing; and reasons through difficult ethical scenarios that frequently arise in business contexts.
Prerequisites: ENG 1101

PHIL 2120
Philosophy of Art and Beauty
Pathways: Creative Expression

3 cl hrs, 3 cr

An examination of the standards of aesthetic criticism, the meaning of aesthetic concepts, beauty in nature, the different kinds of art and their contribution to personal and societal development.
Prerequisite: ENG 1101

PHIL 2121
Chinese Philosophy
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

Study of the major Chinese philosophers including Confucius, Mencius, Lao Tzu, Chuang Tzu, Mo Tzu, the Ch'an School and Chu His in their religious, political and social contexts.
Prerequisite: ENG 1101

PHIL 2203
Health Care Ethics
Pathways: Individual and Society

3 cl hrs, 3 cr

An examination of the major ethical theories on what is morally right and wrong, and the meaning of moral concepts (e.g., the concepts of right and duty). Focus is on ethical problems associated with the practice of medicine and biomedical research. (Available to health science students as an alternative to PHIL 2103).
Prerequisite: ENG 1101

PHIL 2203ID
Health Care Ethics
Pathways: Individual and Society
College Option: Interdisciplinary

3 cl hrs, 3 cr

An examination of the major ethical theories on what is morally right and wrong, and the meaning of moral concepts (e.g., the concepts of right and duty). Focus is on ethical problems associated with the practice of medicine and biomedical research. (Available to health science students as an alternative to PHIL 2103).
Prerequisite: ENG 1101

PHIL 3208
Political Philosophy
Pathways: Individual and Society

3 cl hrs, 3 cr

An examination of interrelationships between individuals and society, views on human nature, the social contract, alienation as a social problem, justifiability of government, limits to governmental power.
Prerequisite: Previous philosophy course or department approval

PHIL 3209
Philosophy of Religion

3 cl hrs, 3 cr

Study of meaning of "God"; Is faith justifiable? Proofs of God's existence or non-existence; types of religious experience; and the relation of religion to science, ethics and contemporary life.
Prerequisite: Previous philosophy course or department approval

PHIL 3210
Existentialism and Contemporary Life

3 cl hrs, 3 cr

Origins and development of existentialist philosophy and its impact on religion, literature, psychology and social issues. The frequent description of existentialism as a philosophy of extreme pessimism. Influence of existentialism on modern thought.
Prerequisite: Previous philosophy course or department approval

PHIL 3211
Philosophy of Law
Pathways: Individual and Society

3 cl hrs, 3 cr

An examination of the concepts and classifications used in and about legal systems; problems of legal reasoning and judicial decision-making; and the evaluation of philosophical and legal arguments in the areas of justice, liberty and responsibility on such issues as civil disobedience, capital punishment, censorship and pornography, reverse discrimination, theory of torts and contracts.
Prerequisite: Previous philosophy course or department approval

PHIL 3212
Engineering Ethics
Pathways: Individual and Society

3 cl hrs, 3 cr

This course will involve a philosophical evaluation of the goals, methods, standards and values involved in engineering. It will cover the ethical and political implications of engineering and its role in work, leisure and in transforming the environment. The course will concentrate on analysis and case studies involving problematic moral situations with relevance to engineering, or involving engineering decisions.
Prerequisite: Previous philosophy course or department approval

PHIL 3400
Environmental Philosophy
Pathways: Individual and Society

3 cl hrs, 3 cr

Study of selected global environmental issues (e.g., population, planetary warming, bio-diversity loss, world hunger, sustainable development, pollution, etc.) by means of philosophical analysis of the concepts, arguments and values involved in their discussion.
Prerequisite: Previous philosophy course or department approval

PSY 1100
Psychology of Adjustment

3 cl hrs, 3 cr

General theories and methods of psychology, individual differences, failure of adjustment, psychological

stress and coping mechanisms, personality, learning, mental health and mental hygiene, therapeutic techniques, behavior in work situations and current views of psychological problems.
Prerequisite: None; Note: This course may be used for elective credit for students in associate degree programs but may not be used as a prerequisite for additional psychology courses or as a substitution for PSY 1101. Students who have passed both the CUNY reading and writing exams should not register for this course.

PSY 1101
Introduction to Psychology
Pathways: Individual and Society

3 cl hrs, 3 cr

Methodology, history and theories of psychology, brain and behavior, neuropsychology, socialization, motivation, emotion, perception, learning, thinking, intelligence, personality and the adjustment processes, and social psychology.
Prerequisite: CUNY proficiency in reading and writing

PSY 2300
Developmental Psychology
Pathways: Individual and Society

3 cl hrs, 3 cr

The various aspects of physical, social, cognitive and emotional development of the human being from conception until death. A comprehensive review of each stage of development (including growth, maturation and learning). The major factors influencing behavior throughout the life span. Findings from studies in experimental, clinical and cross-cultural research.
Prerequisite: PSY 1101; Note: A student who takes and passes PSY 2300 may not take for degree credit PSY 2301, PSY 2302 or PSY 2303. Similarly, any student who takes and passes one or more of these three courses may not obtain degree credit for PSY 2300.

PSY 2301
Child Psychology
Pathways: Individual and Society

3 cl hrs, 3 cr

Physical, social, cognitive and emotional development of the child from conception through middle childhood and the major factors influencing the child's total behavior.
Prerequisite: PSY 1101

PSY 2302
Psychology of Adolescence and Adulthood

Pathways: Individual and Society
3 cl hrs, 3 cr

Developmental psychology of the individual, beginning with adolescence, continuing through early and middle adulthood,

through retirement, old age and death. All aspects of development are considered: physical, cognitive, emotional and social.

Prerequisite: PSY 1101

PSY 2303

Psychology of Aging

Pathways: Individual and Society

3 cl hrs, 3 cr

Definitions of the aging processes, theoretical aspects, genetic and environmental interactions, the functional aspects of aging, personality and the adjustment processes, psychopathology, social aspects, creativity and aging, death and dying.

Prerequisite: PSY 1101

PSY 2401

Social Psychology

Pathways: Individual and Society

3 cl hrs, 3 cr

The basic psychological principles involved in the scientific study of individual behavior in social and group situations are examined. Emphasis is placed on understanding attitude formation and change, conformity, group interaction, leadership roles, altruism, aggression and prejudice.

Prerequisite: PSY 1101

PSY 2402

Psychology of Personality

Pathways: Individual and Society

3 cl hrs, 3 cr

Methodology and research practices used to measure personality, reviews of the major theories which attempt to explain the development of personality including Freudian and Neo-Freudian theories of personality, Trait Theories and Humanistic Theories. Also covered are the biological influences of personality and behavioral aspects of personality.

Prerequisite: PSY 1101

PSY 2403

Abnormal Psychology

Pathways: Individual and Society

3 cl hrs, 3 cr

An introduction to the field of abnormal psychology: major theories, research and techniques. Varying concepts of abnormality throughout history including whether or not various behaviors are truly abnormal. Use of case history data to discuss the etiology, diagnosis, treatment and possible prevention of various psychological and behavioral disorders. Consideration of the point of view of leading theoretical approaches.

Prerequisite: PSY 1101

PSY 2404

Personnel and Organizational Psychology

Pathways: Individual and Society

3 cl hrs, 3 cr

Theory and techniques of personnel problems in industry and business. Dynamics of individual and group behavior in work situations, selection, evaluation methods, interviewing and leadership development. The psychological implications of mechanization and automation are considered.

Prerequisite: PSY 1101

PSY 2404ID

Personnel and Organizational Psychology

Pathways: Individual and Society

College Option: Interdisciplinary

3 cl hrs, 3 cr

Theory and techniques of personnel problems in industry and business. Dynamics of individual and group behavior in work situations, selection, evaluation methods, interviewing and leadership development. The psychological implications of mechanization and automation are considered.

Prerequisite: PSY 1101

PSY 2501 or EDU 2610

Child and Adolescent Development

3 cl hrs, 3 cr

Exploration of childhood and adolescent development. Analyses of developmental theories and principles in the areas of perception, cognition, language, personality, social relations, moral behavior and developmental disorders. Emphasis is placed on application of findings in educational settings.

Prerequisite: PSY 1101

PSY 3405

Health Psychology

Pathways: Individual and Society

3 cl hrs, 3 cr

An overview of existing psychological and epidemiological findings on the relationship between behavior and disease. The course explores how behavior, emotion and cognition can influence disease processes and examines the impact of stress and personal control on specific coronary, immune and infectious disease symptoms. Social support, referral and interventions for optimal physical and mental health are introduced.

Prerequisite: PSY 1101, ENG 1101

PSY 3405ID

Health Psychology

Pathways: Individual and Society

College Option: Interdisciplinary

3 cl hrs, 3 cr

An overview of existing psychological and epidemiological findings on the relationship between behavior and disease. The course explores how behavior, emotion and cognition can influence disease processes and examines the impact of stress and personal control on specific coronary, immune and infectious disease symptoms. Social support, referral and interventions for optimal physical and mental health are introduced.

Prerequisite: PSY 1101, ENG 1101

PSY 3407

Psychology of Visual Perception

Pathways: Scientific World

3 cl hrs, 3 cr

The physiological, psychophysical and cognitive perspectives that guide the contemporary understanding of human visual sensation and perception are explored. Students are provided with the opportunity to test various theoretical perspectives covered by using the experimental method. Topics covered include object perception, depth perception, motion perception, size perception and color perception.

Prerequisites: PSY 1101, ENG 1101

PSY 3502 or EDU 3610

Human Learning and Instruction

3 cl hrs, 3 cr

Exploration of variables underlying effective instruction. Analyses of learning theories and principles in the areas of classical conditioning and instrumental learning, generalization and discrimination, verbal learning and transfer, short-term and long-term memory; reward and punishment, and the effect of motivation on learning.

Prerequisites: PSY 1101, ENG 1101

SBS 2000

Research Methods for the Social and Behavioral Sciences

3 cl hrs, 3 cr

An introduction to the research methodologies utilized in the social and behavioral sciences, beginning with the fundamentals of research design, through data collection, analysis, interpretation, and the final reporting of results. Both quantitative and qualitative designs are examined using software to aid in inquiry and analysis. *Prerequisite: Any introductory ANTH, ECON, GEOG, GOV, HIS, PSY, SOC, or, any AFR or LATS 1400 series course, or AFR 1501, 1502, 2402 or 3000, or COMM 2402, or 3401 and MAT 1180 or higher; COMD students will also need the prerequisite of PSY 3407*

SBS 2000ID

Research Methods for the Social and Behavioral Sciences

College Option: Interdisciplinary

3 cl hrs, 3 cr

An introduction to the research methodologies utilized in the social and behavioral sciences, beginning with the fundamentals of research design, through data collection, analysis, interpretation, and the final reporting of results. Both quantitative and qualitative designs are examined using software to aid in inquiry and analysis. *Prerequisite: Any introductory ANTH, ECON, GEOG, GOV, HIS, PSY, SOC, or, any AFR or LATS 1400 series course, or AFR 1501, 1502, 2402 or 3000, or COMM 2402, or 3401 and MAT 1180 or higher; COMD students will also need the prerequisite of PSY 3407*

SBS 3201

Gender, Dress and Society

3 cl hrs, 3 cr

The study of theories related to appearance, clothing, and fashion, and their influences on cultural identities, gender perceptions, and fashion product consumption. Examines contemporary dress from cultures outside and within the United States.

Prerequisites: BUF 2246, PSY 1101

SOC 1101

Elements of Sociology

Pathways: Individual and Society

3 cl hrs, 3 cr

Perspectives on sociology as an analytical science. The emphasis is on concepts, hypotheses and theories which explain social behavior and social change.

Prerequisite: CUNY proficiency in reading and writing

SOC 1102

Urban Sociology

Pathways: Individual and Society

3 cl hrs, 3 cr

A sociological perspective on the nature and origins of the modern city, and the community of life in relation to the urban metropolis.

Prerequisite: CUNY proficiency in reading and writing

SOC 1103

The Family

Pathways: Individual and Society

3 cl hrs, 3 cr

The family viewed as an institution and social group. Emphasis on family as a social system in changing society.

Prerequisite: CUNY proficiency in reading and writing

SOC 1104
Race and Ethnic Relations
Pathways: US Experience in Its Diversity

3 cl hrs, 3 cr

The impact of race and ethnicity on social relationships. Primary focus is on American society. Analysis of human relations from both social-structural and social-psychological perspectives.

Prerequisite: CUNY proficiency in reading and writing

SOC 2201
Sociology of Aging
Pathways: Individual and Society

3 cl hrs, 3 cr

This course provides an analytical understanding of growing old in the United States of America. Topics center around the effects of social, political and economic inequality upon the elderly. It will also concentrate on the roles the elderly play within such social institutions as religion, community and the family.

Prerequisite: Any 1000-level SOC course

SOC 2401
Society, Technology and Self
Pathways: Individual and Society

3 cl hrs, 3 cr

This course analyzes the social relationship between society, technology and self from a sociological perspective. The emphasis of this course is on technology as the principal form of social interaction, and as a determinant of the reconstitution of the character and personality structures.

Prerequisite: Any 1000-level SOC course

SOC 2403
Law and Society
Pathways: Individual and Society

3 cl hrs, 3 cr

Since the legal system was codified, there has been an interaction between society and the law. Investigates the dynamic interplay between social systems and legal systems. Included are discussions of historical and contemporary legal systems, and an analysis of the function of the law (as a profession and as a system of social control).

Prerequisite: Any 1000-level SOC course or PSY 1101

SOC 3301
The Emerging Global Society
Pathways: World Cultures and Global Issues

3 cl hrs, 3 cr

This course will explore the social, economic, political and ecological

dimensions of the globalization process. A number of issues related to global inequality will be discussed including population growth, hunger and poverty, environmental degradation and the rise of ethnic conflicts.

Prerequisites: ENG 1101 and one of the following: any Sociology course (SOC), ECON 1101 or HIS 1102

SOC 3302
Environmental Sociology
Pathways: Individual and Society

3 cl hrs, 3 cr

This course examines the complex interactions between societies and the natural environments on which they depend. Special emphasis is placed on the link between the deepening ecological crisis and the operation of the capitalist socio-economic system.

Prerequisites: ENG 1101 and any SOC or ANTH course

SOC 3302ID
Environmental Sociology
Pathways: Individual and Society

College Option: Interdisciplinary

3 cl hrs, 3 cr

This course examines the complex interactions between societies and the natural environments on which they depend. Special emphasis is placed on the link between the deepening ecological crisis and the operation of the capitalist socio-economic system.

Prerequisites: ENG 1101 and any SOC or ANTH course

SOC 3402
The Sociology of Social Problems
Pathways: Individual and Society

3 cl hrs, 3 cr

A sociological inquiry into the interrelationships among social issues and problems. The emphasis is on resolution and prevention of contemporary intergroup problems in the United States of America.

Prerequisites: Any 1000-level SOC course, ENG 1101

STS 3401
Science, Technology and Society: The Relationship Between Society and Modern Technology

3 cl hrs, 3 cr

An interdisciplinary course designed to analyze the relationship between humans and modern technology. People are alienated by technology from traditional opportunities to contribute their individuality to society. However, new opportunities exist as a result of technology for people to improve society. The individual makes use of the social

sciences, humanities and sciences to build an analytic framework for the understanding of the challenges facing the educated person in an ever-changing technological world. This course will build upon prior exposure to principles and techniques of arts, sciences and technologies.

Prerequisite: Completion of associate degree core or department approval required

SCHOOL OF PROFESSIONAL STUDIES

David B. Smith, Dean of the School of Professional Studies
Namm Hall, room N 621
718.260.5345
email: dsmith@citytech.cuny.edu

Billie Coleman, Assistant to the Dean
email: bcoleman@citytech.cuny.edu

Departments:

Business (Accounting and Marketing)	Career and Technology Teacher Education	Dental Hygiene
Hospitality Management	Health and Human Services	Law and Paralegal Studies
Nursing	Radiologic Technology and Medical Imaging	
Restorative Dentistry	Vision Care Technology	

Degree Programs:

Bachelor of Science (BS)

Business and Technology of Fashion	Career and Technical Teacher Education	Health Services Administration
Human Services	Legal Assistant Studies	Nursing
Technology Teacher Education	Radiological Science	

Bachelor of Technology (BTech)

Hospitality Management

Associate in Science (AS)

Business and Technology of Fashion

Associate in Applied Science (AAS)

Accounting	Dental Hygiene	Dental Laboratory Technology
Hospitality Management	Human Services	Legal Assistant Studies
Marketing Management and Sales	Nursing	Ophthalmic Dispensing
Radiologic Technology		

Certificate Programs:

Technology Teacher Education Transitional C Certificate

Mission

The mission of the School of Professional Studies is to prepare students for careers working with patients, clients and students. Programs focus on health care, business, the legal system, hospitality and career education.

Majors combine the liberal arts with professional courses to prepare students for licensure and employment. Technology, technical skills, professional ethics and concern for patients and clients, are hallmarks of the curricula.

Baccalaureate degree programs are scheduled with evening, weekend and partially online courses, to accommodate the needs of students who are working while attending school.

Students enrolled in the School of Professional Studies want to make a difference in the lives of patients, clients and students. They want to begin or advance careers in the world of business, law, or hospitality.

Business

Professor Lucas Bernard, Chair
Namm Hall, room N 1012
718.260.5773
email: lbernard@citytech.cuny.edu

PROGRAMS:

Accounting/AAS
Marketing Management and Sales/AAS
Business and Technology of Fashion/AS
Business and Technology of Fashion/BS

FACULTY:

Professors: Carroll, Zissu
Associate Professors: Bernard, Dixon
Assistant Professors: Adomaitis, Cheng, Iraggi, Raskin, Reinig, Tung, Sutton, Zimmerman
Lecturer: Singh

Associate in Applied Science in ACCOUNTING

The Accounting program equips students with accounting skills that will make them immediately employable upon graduation with the associate degree. Graduates will also be able to transfer to accounting programs at other senior colleges within The City University of New York through existing articulation agreements. Students should consult City Tech's Career and Transfer Office, the Namm Building, room N 105 for additional information.

Accounting graduates are employed in all facets of industry, holding responsible positions in major corporations and not-for-profit groups such as hospitals, service organizations and governmental agencies. Some of these employers include Long Island College Hospital, the Brooklyn Hospital, Brookdale Hospital, Downstate Medical Center, NYU Medical Center, the New York City Department of Finance, the Internal Revenue Service, H & R Block, the New York State Department of Taxation and Finance, the New York City Department of Housing, Astoria Federal Savings Bank, TD Bank, JPMorgan Chase, HSBC Bank, Wachovia Bank, Ernst & Young, ConEdison and National Grid.

Learning Outcomes in Accounting

The Accounting program at City Tech will help students:

- To acquire effective business communication skills, via group reports;
- To understand the components of financial statements;
- To be proficient in the use of computer spreadsheets and integrated accounting systems;
- To understand how management uses information from the accounting system to operate business enterprises;
- To acquire knowledge of the accounting cycle.

GENERAL EDUCATION COMMON CORE ¹

25 CREDITS

I – REQUIRED CORE ² (3 COURSES, 10 CREDITS) *

English Composition (1 course, 3 credits)

ENG 1101	English Composition I	3
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Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1375 or higher ³	Precalculus	4
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Life and Physical Sciences (1 course, 3 credits)

Any Approved Course	3
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II – FLEXIBLE CORE (4 COURSES, 12 CREDITS) *

In addition to the two required courses listed below, select one course each from any two of the other four areas; no more than two courses may be selected from any discipline.

Individual and Society

ECON 1401	Microeconomics	3
COM 1330 or higher	Public Speaking	3

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Creative Expression

Any Approved Course

Scientific World

Any Approved Course

Writing Intensive Requirement ⁴

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

38 CREDITS *

ACC 1101	Principles of Accounting I	4
ACC 1201	Principles of Accounting II	4
ACC 2301	Intermediate Accounting I	3
ACC 2311	Cost Accounting I	3
ACC 2322	Taxes	3
ACC 2401	Intermediate Accounting II	3
ACC 2411	Cost Accounting II	2
BUS 1122	Business Law	3
BUS 2339	Financial Management	3
BUS 2341	Financial Forecasting	3
BUS 2425 ⁵	Business Management	3
CST 2206	Introduction to Information Systems and Technologies	4
MAT 1375	Precalculus or higher	Met as GenEd
ECON 1401	Microeconomics	Met as GenEd

COM 1330	Public Speaking or higher	Met as GenEd
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES	38	
TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS	22	
TOTAL CREDITS REQUIRED FOR THE DEGREE	60	

1 Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.

2 Specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category.

3 Students without the requisite math background to enter MAT 1375 must take MAT 1175, and/or MAT 1275 in preparation, depending on initial placement. This will increase the number of required credits for the degree by 4-8.

4 A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

5 A potential substitute for BUS 2425 is Independent Study 901 (required: a 3.0 minimum GPA and departmental permission).

* The sum of all credits for the degree must add up to at least 60.

Associate in Applied Science in MARKETING MANAGEMENT AND SALES

The Marketing program is designed for the student interested in dynamic careers in the 21st century. Today's marketing student must prepare for tomorrow's business opportunities and be educated and sensitive to cultural diversity, environmental concerns, technological changes and ethical issues to facilitate the exchange of goods and services in the global marketplace.

Students in management and sales are introduced to careers in marketing management, professional selling, sales management, market research, supply chain management, direct marketing, entrepreneurship and advertising. In addition to the specialized courses, the curriculum offers general business subjects to broaden the students' competence required in business and industry today. Among the employers of graduates of this program are: General Foods Corporation, Prudential Financial Services, New York Life Insurance Company, Gallo Wine, Procter and Gamble, TD Bank, JPMorgan Chase, United Parcel Service, Staples, Virgin Atlantic Records, Crate and Barrel, Abercrombie and Fitch, PepsiCo, Essence Magazine, New York City Transit Authority and Sprint.

Graduates have a history of success in business including advancing to executive positions and/or becoming entrepreneurs of their own businesses. Many continue their education and receive baccalaureate degrees.

Learning Outcomes in Marketing Management and Sales

The Marketing Management and Sales program at City Tech will help students learn:

- How to be prepared for a wide range of business opportunities in marketing's fast paced and highly competitive world.
- How to obtain a career in fields such as marketing management, marketing research, professional selling and advertising.
- Hands on experience through field trips and special tours that enhance the overall learning experience.
- How to further your college career by transferring to a senior college to acquire a baccalaureate degree.

GENERAL EDUCATION COMMON CORE ¹ 21-22 CREDITS

I – REQUIRED CORE ² (3 COURSES, 9-10 CREDITS) *

English Composition (1 course, 3 credits)

ENG 1101	English Composition I	3
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Mathematical and Quantitative Reasoning (1 course, 3-4 credits)

MAT 1190	Quantitative Reasoning	3-4
MAT 1275 or higher ³	College Algebra and Trigonometry (MAT 1275 strongly recommended)	

Life and Physical Sciences (1 course, 3 credits)

Any Approved Course	3
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II – FLEXIBLE CORE (4 COURSES, 12 CREDITS) *

In addition to the two required courses listed below, select one course each from any two of the other four areas; no more than two courses may be selected from any discipline.

Individual and Society

ECON 1401	Microeconomics	3
COM 1330 or higher	Public Speaking	3

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Creative Expression

Any Approved Course

Scientific World

Any Approved Course

Writing Intensive Requirement ⁴

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 39-40 CREDITS *

ACC 1162	Elements of Accounting	3
	or	
ACC 1101	Principles of Accounting	4
BUS 1122	Business Law	3
BUS 2339	Financial Management	3
BUS 2341	Financial Forecasting	3
BUS 2425 ⁵	Business Management	3
MKT 1100	Essentials of Marketing	3
MKT 1102	Principles of Selling	3
MKT 1210	Marketing Research	3
MKT 1212	Consumer Behavior	3
MKT 1214	Advertising	3
MKT 2300	Direct and Interactive Marketing	3
MKT 2327	or Entrepreneurship	

MKT 2373	Supply Chain Management	
	or	
MKT 2410 ⁶	Marketing Management	3
MKT 2414 ⁶	Sales Management	3
ECON 1401	Microeconomics	Met as GenEd
MAT 1190	Quantitative Reasoning	
	or	
MAT 1275	College Algebra and Trigonometry	Met as GenEd
COM 1330	Public Speaking	
or higher		Met as GenEd
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE⁷ COURSES		39-40
TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS		21-22
TOTAL CREDITS REQUIRED FOR THE DEGREE		60

1 Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.

2 Specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category.

3 Students who choose to take a more advanced mathematics course, e.g., MAT 1275, may increase their total number of credits for the degree by at least 1 credit. In addition, students without the requisite math background to enter MAT 1275 must take MAT 1175 in preparation, depending on initial placement. This will increase the number of required credits for the degree by 4.

4 A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

5 A potential substitute for BUS 2425 is Independent Study 901 (required: a 3.0 minimum GPA and departmental permission).

6 Potential substitutes for MKT 2410 and MKT 2414 are BUS 3525 and MKT 2373. Only one of these courses may be substituted per student.

7 The number of elective credits will vary depending upon students' choices in the General Education Common Core and Accounting.

* The sum of all credits for the degree must add up to at least 60.

Associate in Science in BUSINESS AND TECHNOLOGY OF FASHION

The Business and Technology of Fashion AS program is a 2-year degree designed for the student interested in the dynamics of fashion, both as a business and as an expression of contemporary culture. The study of fashion begins with the fundamentals of business, marketing and merchandising of fashion goods and technical product information. Through the core curriculum the student gains insight into many subjects that help to explain sociological and psychological factors which influence fashion interest and demand in today's global market. Students in fashion marketing are introduced to buying and management careers in fashion-related manufacturing firms, showrooms, retail stores and electronic commerce. Graduates are employed in business organizations in the United States and Europe as executive or administrative trainees in the growing field of fashion marketing and business management. Some establish and operate their own businesses. Employers of graduates may include well-known and established firms, e.g., Saks, Macy's, J.C. Penney, ENYCE, the Gap, Bloomingdale's, Dolce & Gabana, Mary Kay Cosmetics, Victoria's Secret and Models.com. Our graduates have a history of success in the industry and many advance to higher executive positions.

Learning Outcomes for the AS in the Business and Technology of Fashion:

- Identifying and applying general business practices to the specifics of the fashion industry.
- Navigating modern fashion industry electronic resources, including e-commerce and social networking.
- Distinguishing between domestic and international processes, and adapting to inevitable changes in the fashion industry.
- Applying knowledge about the roles and functions of fashion industry sectors in which products are developed, sourced, produced, marketed, sold, and consumed.

GENERAL EDUCATION COMMON CORE		21 CREDITS
I – REQUIRED CORE (4 COURSES, 12 CREDITS)		
English Composition (2 courses, 6 credits)		
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
Mathematical and Quantitative Reasoning (1 course, 3 credits)		
MAT 1190	Quantitative Reasoning or higher	3
Life and Physical Sciences (1 course, 3 credits)		
	Any Approved Course	3
II – FLEXIBLE CORE (6 COURSES, 18 CREDITS)		
Select one course from each of the following areas plus one additional course from any of the five areas; no more than two courses may be selected from any discipline.		18

Individual and Society

Any Approved Course

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Creative Expression

Any Approved Course

Scientific World

Any Approved Course

One Additional Course from Any Area

Any Approved Course

Writing Intensive Requirement¹

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS (7-8 COURSES) 21-24 CREDITS

ACC 1101	Principles of Accounting I	
	or	
ACC 1162	Elements of Accounting	3-4
BUF 1101	Introduction to the Fashion Industry	3
BUS 2339	Financial Management	3
ARTH/HIS 1204	20th Century Dress and Culture ²	3
MKT 1103	Foundations of Marketing and Sales	3
MKT 1210	Marketing Research	3
MKT 1214	Advertising	3
BUF 2400	Product Development in the Fashion Industry	3

Program Electives

From the list below, select courses to reach 60 credits overall

BUF 2203	Visual Merchandising	3
BUF 2246	Textiles	3
BUF 2255	Merchandising, Planning and Buying	3
BUF 3100	Trend Forecasting and Social Media	3
BUF 3300	International Retailing	3
BUF 3310	Contemporary Designers and Luxury Markets	3
BUF 3400	E-Commerce and Global Marketing	3
BUF 3500	Brand Image Marketing	3
BUS 1122	Business Law	3
BUS 2341	Financial Forecasting	3
MKT 2300	Direct and Interactive Marketing	3
MKT 2327	Entrepreneurship	3
SBS 3201	Gender, Dress and Society	3

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 30**TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS 30-31****TOTAL CREDITS REQUIRED FOR THE DEGREE 60-61**

¹ A semester-specific list of writing intensive courses is available online at the [City Tech Pathways website](#).

² This course can be taken as a double duty course, i.e., a program degree requirement that also meets a general education requirement. In that case, an additional elective may be selected from the list of electives.

Bachelor of Science in BUSINESS AND TECHNOLOGY OF FASHION

The Bachelor's degree in the Business and Technology of Fashion (BTF) was created for students desiring to begin and develop careers in the fashion industry. The program provides a clear pathway into many employment opportunities coupled with basic business skills and a sequence of required and elective liberal arts courses. The core curriculum provides insight into the sociological and psychological factors which influence fashion interest and demand in today's global market. With a rare focus on both business and technology, it is perfectly placed at City Tech, where we are able to take advantage of the technological strengths of the college in all of the forward-looking high-tech approaches that are defining tomorrow's economy.

The program requires 120 credits, and graduates will receive a Bachelor of Science degree in the Business and Technology of Fashion. Distinct modules allow students to select a specialization track attuned to progressive industry models and career opportunities. Current modules include Global Fashion, Innovation in E-Commerce and Fashion Merchandising Administration. Entry-level careers for graduates include merchandising, stylists, bloggers and sale associates. Some graduates may progress to positions as buyers, e-commerce executives, product line manager and fashion forecasters.

Progression in the Business and Technology of Fashion Program:

For progression in the curriculum,

- A minimum grade of "C" must be earned in each course designated with the prefix BUF, BUS, or MKT.
- Students must maintain a 2.5 GPA. A student falling below 2.5 will have one semester to resolve this deficit.

If a student fails to meet the above requirements, he/she will be required to withdraw from the BTF curriculum.

Learning Outcomes for the BS in the Business and Technology of Fashion include:

- Identifying and applying general business practices to the specifics of the fashion industry.
- Navigating modern fashion industry electronic resources, including e-commerce and social networking.
- Gaining knowledge of the fundamentals of business, including finance and accounting.
- Distinguishing between domestic and international processes, and adapting to inevitable changes in the fashion industry.
- Applying knowledge about the roles and functions of fashion industry sectors in which products are developed, sourced, produced, marketed, sold, and consumed.

GENERAL EDUCATION COMMON CORE		42 CREDITS
I – REQUIRED CORE (4 COURSES, 12 CREDITS)		
English Composition (2 courses, 6 credits)		
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
Mathematical and Quantitative Reasoning (1 course, 3-4 credits)		
MAT 1190 or higher		3-4
Life/ Physical Science (1 course, 3-4 credits)		
Any approved course		3-4
(CHEM 1000 Principles of Chemistry recommended ¹⁾)		
II – FLEXIBLE CORE (6 COURSES, 18 CREDITS)		
From the list of approved courses select one course from each of the following areas; no more than two courses may be selected from any discipline.		
World Cultures and Global Issues		
Any approved course		3
US Experience in its Diversity		
Any approved course		3
Creative Expression		
Any approved course		3
Individual and Society		
Any approved course		3
Scientific World		
Any approved course		3
One additional course from any group		3
III – COLLEGE OPTION REQUIREMENT ² (12 CREDITS)		
One course in Speech/Oral Communication ³		3
One interdisciplinary Liberal Arts and Sciences course		3
Two additional liberal arts courses		6
In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language		
Writing Intensive Requirement.		
Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.		
PROGRAM SPECIFIC LIBERAL ARTS COURSES		18 CREDITS
Liberal Arts Courses ⁴ (18 credits)		
ARTH 1103	Survey of Art History	3
ARTH/HIS 1204	20th Century Dress and Culture	3
ECON 1101	Macroeconomics	3
SBS 3201	Gender, Dress and Society	3

One Liberal Arts Course from one of the Modules		3
CST 1101	Problem Solving with Computers (Innovation in Ecommerce)	
PSY 3407	Psychology of Visual Perception (Fashion Merchandising Administration)	
HIS 1103	Modern Western Civilization (Global Fashion)	
Liberal Arts course (selection based on Individual Module design)		
Select one from the following courses		3
ANTH 1101	Introductory Anthropology	
PSY 1101	Introduction to Psychology	
SOC 1101	Elements of Sociology	
Elective Liberal Arts Courses Credits to equal or exceed 60 ⁵ 0-18		
PROGRAM-SPECIFIC DISCIPLINE DEGREE REQUIREMENTS: 60 CREDITS		
General Business and Marketing Courses (5 courses, 15 credits)		
MKT 1210	Marketing Research	3
MKT 1103	Foundations of Marketing and Sales	3
(MKT 1100 & MKT 1102 may be used to satisfy MKT 1103 requirement)		
MKT 1214	Advertising	3
BUS 2339	Financial Management	3
Pick one from the two courses below:		3
ACC 1101	Principles of Accounting I	
ACC 1162	Elements of Accounting	
Introductory Level Fashion Courses (5 courses, 15 credits)		
BUF 1101	Introduction to the Fashion Industry (formerly MKT 2335)	3
BUF 2203	Visual Merchandising (Writing Intensive Course)	3
BUF 2246	Textiles (formerly MKT 1246)	3
BUF 2255	Merchandise Planning and Buying (formerly MKT 1255)	3
BUF 2400	Product Development in the Fashion Industry	3
Junior Foundation Courses (4 courses, 12 credits)		
BUF 3100	Trend Forecasting and Social Media (Writing Intensive Course)	3
BUS 1122	Business Law	3
BUS 2341	Financial Forecasting	3
Pick one from the two courses below		3
MKT 2327	Entrepreneurship	
or		
MKT 2300	Direct and Interactive Marketing	
Specialization Modules (4 courses, 12 credits)		
Select one module from the list below. With department advice and approval, students may also design their own module comprised of courses with equivalent rigor and focus		
Module: Fashion Merchandising Administration		
PSY 3407	Psychology of Visual Perception	3
BUF 3500	Brand-Image Marketing	3
BUF 3510	Fashion Buying Technologies (formerly MKT 2401)	3
BUF 4500	Omni-Channel Retailing	3

Module: Global Fashion

HIS 1103	Modern Western Civilization	3
BUF 3300	International Retailing	3
BUF 3310	Contemporary Designers and Luxury Markets	3
BUF 4300	Global Sourcing and International Retail Trade (Writing Intensive Course)	3

Module: Innovation in E-Commerce

CST 1101 or CST 1102		3
COMD 3563	Web Traffic and Analytics	3
BUF 3400	E-Commerce and Global Marketing	3
BUF 4400	Merchandising and Marketing for Digital Platforms	3

Culminating Experience Courses (3 courses, 9 credits)

BUF 4700	Contemporary Issues in the Fashion Industry	3
BUF 4900	Internship	3
Elective Select any Business Discipline course: ACC, BUF, BUS, MKT		3

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES **60**

TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS **60**

TOTAL CREDITS REQUIRED FOR THE DEGREE **120**

1 For purposes of advisement, specific courses listed are "double-duty" courses: degree requirements that also meet CUNY Pathways general education requirements in that category. Students are not required to take these courses to meet their GenEd requirements; however, making a different choice may result in additional credits needed to complete the degree.

2 Complete lists of liberal arts and sciences courses and advanced liberal arts courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

3 Students who have already met this requirement may choose any other liberal arts and sciences course in its place.

4 The courses listed here are prerequisites for other required courses. These courses may also be used to fulfill flexible common core or college option requirements. In addition, on approval of the department, other suitable liberal arts courses may be substituted for prerequisite requirements.

5 The number of free elective credits will vary depending upon the program-specific courses students use to meet Common Core requirements. Double duty use of courses is encouraged, as this allows more flexibility in fulfilling liberal arts requirements.

COURSES:**ACC 1101****Principles of Accounting I**

3 cl hrs, 3 lab hrs, 4 cr

The accounting cycle including journalizing, posting, preparation of trial balance, worksheet, adjusting entries, financial statements, closing entries and preparation of a post-closing trial balance. Special journals, subsidiary ledgers and accounting principles. Special emphasis given to cash, accounts receivable, notes, inventories and plant assets, internal control. For all students in Business Department majors, a grade of C is required to progress into subsequent accounting courses.

Prerequisite: CUNY proficiency in reading and mathematics

ACC 1162**Elements of Accounting**

3 cl hrs, 3 cr

Journals, ledgers and the salient features of the accounting cycle. Preparation and interpretation of financial statements, cash and bank reconciliations. This course is not available to accounting or computer systems technology majors.

Prerequisite: CUNY proficiency in reading and mathematics

ACC 1201**Principles of Accounting II**

3 cl hrs, 3 lab hrs, 4 cr

The accounting cycle including a practice set, payroll accounting, partnership accounting and accounting for corporations, nature and formations of corporations, capital stock, retained earnings, long-term liabilities and investments, additional managerial internal reports, statements of cash flows and statement analysis, responsibility accounting such as departmental accounting and manufacturing accounting. Accounting principles are reviewed thoroughly.

Prerequisite: ACC 1101; Pre- or corequisite: MAT 1175 or higher or eligibility for MAT 1275

ACC 2301**Intermediate Accounting I**

3 cl hrs, 3 cr

An overview of the entire accounting process including the development of accounting theory and practices, the accounting cycle and analysis, the recommendations and pronouncements of the various accounting bodies, accounting for and controlling cash, marketable securities and receivables. The concept of present value is also discussed.

Prerequisite: ACC 1201

ACC 2311**Cost Accounting I**

3 cl hrs, 3 cr

Fundamental principles of accounting in manufacturing. Manufacturing statements are introduced and related to the overall financial statements. Cost information systems, job order and process cost accumulation procedures are thoroughly analyzed. Planned, applied and actual factory overhead are discussed. Throughout the course, cost accounting is treated as a reporting and analytical function for management planning and control.

Prerequisite: ACC 1201

ACC 2322**Taxes**

3 cl hrs, 3 cr

An in-depth analysis of taxation of the individual and the appropriate federal tax forms. Taxation of partnerships and corporations is also discussed.

Prerequisite: ACC 1201

ACC 2401**Intermediate Accounting II**

3 cl hrs, 3 cr

An examination of the problems of accounting for and reporting on a firm's current and contingent liabilities and its investment in productive resources: inventories,

plant and equipment and intangible assets; accounting for long-term debt (bonds, notes, mortgages and early extinguishments of debt). Revenue recognition is explored via alternative accounting for long-term contracts.

Prerequisite: ACC 2301

ACC 2411**Cost Accounting II**

2 cl hrs, 2 cr

A continuation of fundamental principles of cost accounting. Standard costs, flexible budgets and overhead control, variances, alternative costing methods, budgeting and the contribution approach to decision-making.

Prerequisite: ACC 2311

BUF 1101**Introduction to the Fashion Industry**

3 cl hrs, 3 cr

Explores the meaning of fashion. The design, production, distribution and promotion of fashion apparel and accessories for both women and men.

Pre- or corequisite: ENG 1101
Equivalent to old course number MKT 2355

BUF 2203
Visual Merchandising

3 cl hrs, 3 cr

An exploration of visual merchandising through the consideration of product presentation in the retail environment. Investigates the theoretical and practical use of in-store environments, lighting, special effects, fixtures and product placement as a form of visual communication intended to convey a specific message about the fashion brand and to influence the consumer. *Prerequisite:* BUF 1101, (MKT 1103 OR (MKT 1100 & MKT 1102))

BUF 2246
Textiles

2 cl hrs, 2 lab hrs, 3 cr

Fabric construction, finishes, decorations and the current fibers being used. Laboratory work concentrates on the identification and analysis of finished cloth. *Prerequisites:* (MKT 1100, MKT 1102; Pre- or corequisite ENG 1101) or BUF 1101, ARTHIHS 1204, CHEM 1000 or higher *Equivalent to old course number MKT 1246*

BUF 2255
Merchandising Planning and Buying

3 cl hrs, 3 cr

Principles and techniques of retail merchandising with emphasis on contemporary merchandising tools. Included will be the development of the merchandise plan, the model stock plan, calculation of markup, average markup, stock turnover, gross margin and operating profit. *Prerequisites:* (MKT 1100, MKT 1102) or (BUF 2203, MAT 1190 or higher) *Equivalent to old course number MKT 1255*

BUF 2400
Product Development in the Fashion Industry

3 cl hrs, 3 cr

An introduction to the study of product development from concept to consumer. Students will learn how research is conducted in the fashion industry and how it is ultimately reflected in garment design. Trend cycles, consumer behavior, social, political, and economic influences are discussed as influences on trend development. *Pre- or corequisite:* MKT 1210, MKT 1214

BUF 3100
Trend Forecasting and Social Media

3 cl hrs, 3 cr

An overview and analysis of current color, fiber, and fashion trends, as well as their impact upon sales forecasting.

Students research, analyze, and develop fashion forecasts related to specific seasons in the apparel industry. *Prerequisite:* BUF 2400, Pre- or corequisite: ARTH 1103

BUF 3300
International Retailing

3 cl hrs, 3 cr

Key issues affecting international retailing with consideration of the global consumer's welfare. Provides the student with a comprehensive view of retailing and an application of marketing concepts in a practical retail managerial environment. *Prerequisite:* MKT 2327 or MKT 2300

BUF 3310
Contemporary Designers and Luxury Markets

3 cl hrs, 3 cr

Examines the aesthetics of major fashion designers from the 19th to the 21st centuries through lecture and study of museum clothing collections. *Prerequisite:* BUF 3100, SBS 3201

BUF 3400
E-Commerce and Global Marketing

3 cl hrs, 3 cr

Introduces the fundamental concepts of electronic commerce and how to analyze these concepts from both a business and technical standpoint with a particular emphasis on the fashion industry, specifically apparel and textile enterprises. Examines the impact of e-commerce in the business world, including various alternative approaches to creating e-commerce solutions. Topics covered include the history of e-commerce and the development of the World Wide Web, e-commerce tools and technologies, internet advertising and marketing strategies and the legal, security and taxation issues critical to the success of any e-Commerce venture. *Prerequisite:* MKT 2300, BUF 3100

BUF 3500
Brand Image Marketing

3 cl hrs, 3 cr

Provides the fundamental techniques of how to build, measure, and manage a brand. An exploration of visual literacy through the consideration of the symbols and imagery used in formulating fashion brands and line identity. Explores the theoretical and practical use of images as a form of visual communication intended to convey a specific message about brand identity. Considers how ideas about identity are made, why some brand identities are more clearly understood than others, and how this ultimately affects consumer choice. *Prerequisite:* MKT 2300, SBS 2301

BUF 3510
Fashion Buying

3 cl hrs, 3 cr

Organization for buying; responsibilities of the buyer; analysis and determination of consumer demand; when and how much to buy; sources of supply and vendor relations; resident, group and central buying; methods and techniques of merchandise selection; the order and its legal ramifications; pricing; utilization of data processing as a tool in making buying decisions. *Prerequisite:* MKT 1255 or (BUF 2255, BUF 3100) *Equivalent to old course number MKT 2401*

BUF 4300
Global Sourcing and International Retail Trade

3 cl hrs, 3 cr

Economic perspective of textile products, production and global sourcing, with emphasis on United States fashion industries. This course is writing intensive. *Pre- or corequisites:* BUF 3300, BUF 3301, HIS 1103

BUF 4400
Merchandising and Marketing For Digital Platforms

3 cl hrs, 3 cr

Examines "Web 2.0" and "Social Media" as an important transition from an old, static form of e-Commerce to one that is highly dynamic, networked and socially connected. Explores how these new technologies and tools are strategically utilized in the fashion industry. *Prerequisites:* COMD 3563, BUF 3400

BUF 4500
Omni-Channel Retailing

3 cl hrs, 3 cr

Provides an in-depth analysis of the nature of distribution channels and their management of customer service at each stage. Topics include e-channel behavior; channel design; selection, motivation, and control of channel members, types of retailers, retailer marketing decisions, the future of retailing, and wholesaling. *Prerequisite:* BUF 3500 or BUF 3510

BUF 4700
Contemporary Issues in the Fashion Industry

3 cl hrs, 3 cr

A senior-level seminar course. Students investigate a specialized topic or topics related to the fashion industry. Research, discussion, and weekly readings culminate in a final paper and presentation. Themes vary each semester. *Pre- or corequisite:* One BUF 4000-level course

BUF 4900
Internship

120 internship hrs, 3 cr

Work experience with a company in the fashion industry, related to the student's interest area. Students apply their formal education to professional situations in order to ease the transition into the work environment. Students keep a journal of their work, submit written analysis and meet periodically to discuss their experiences. *Pre- or corequisite:* One BUF 4000-level course

BUS 1122
Business Law

3 cl hrs, 3 cr

Historical background and sources of law as related to business procedures, with particular emphasis on the formation, operation, performance and discharge of contracts. Survey of local and federal courts. *Prerequisite:* CUNY proficiency in reading and writing

BUS 2339
Financial Management

2 cl hrs, 2 lab hrs, 3 cr

In-depth analysis of the principles of financial management and their application to decision making in a business firm. Topics include: valuation models, capital budgeting principles and applications, cost of capital, alternative methods of financing business firms, and dividend policy. *Prerequisite:* MAT 1190 or higher or eligibility for MAT 1275 or higher

BUS 2341
Financial Forecasting

2 cl hrs, 2 lab hrs, 3 cr

This course provides a working knowledge of the principles and techniques needed for financial forecasting, advanced financial management, modeling techniques, and their application to decision-making in a business context. Topics include: capital budgeting principles and applications, international finance, risk management, stock market and hedging techniques and portfolio construction. Financial projects, using MS-Excel or other spreadsheet programs, and centering on issues faced by business professionals, are a core requirement. *Prerequisite:* BUS 2339

BUS 2425
Business Management

3 cl hrs, 3 cr

The task and process of management, decision-making, the organization structure. Includes a discussion of employer-employee relationships, managerial functions and morale problems in business. *Prerequisites:* ACC 1101 or ACC 1162 or MKT 1210

BUS 3525**Strategic Management**

3 cl hrs, 3 cr

Introduction to strategic management and formal planning as methods for translating business goals into procedures or actions. Tactical planning at operating levels. Development of foresight and classical methods for gathering information essential to decision-making in business organizations.

Prerequisite: BUS 2425

MKT 1100**Essentials of Marketing**

3 cl hrs, 3 cr

Functions involved in distributing goods, the role of the manufacturer in selecting target markets, types of marketing institutions (wholesale and retail). Formulating marketing policies and strategies. The role of government and the effects of consumerism on marketing practices.

Prerequisite: CUNY proficiency in reading

MKT 1102**Principles of Selling**

3 cl hrs, 3 cr

Professional selling techniques are presented and analyzed. The theory and practice of customer-centered selling including techniques of handling objections, demonstrating merchandise and closing sales. Career and leadership aspects of selling are emphasized. Student demonstrations provide practice in realistic sales presentations.

Prerequisite: CUNY proficiency in reading

MKT 1103**Foundations of Marketing and Sales**

3 cl hrs, 3 cr

An introductory survey of today's fast-paced, rapidly changing and interactive global marketing and sales environment. The course introduces contemporary marketing and sales philosophies and practices as they are used for the advertising, selling and distribution of goods through brick and mortar stores, the Internet, World Wide Web and other electronic media.

Prerequisite: CUNY proficiency in reading

MKT 1210**Marketing Research**

3 cl hrs, 3 cr

Emphasis on the use of scientific research methods to strengthen marketing effort. Media, sales promotion and product opinion research, industrial and institutional

research and elementary statistical applications. Practice in preparing formal and informal research reports.

Prerequisites: (MKT 1100 and MKT 1102) or MKT 1103; Pre- or corequisite: ENG 1101

MKT 1212**Consumer Behavior**

3 cl hrs, 3 cr

Behavioral science theories are examined for practical applications in developing marketing strategies. Consumer perception, attitude, motivational theories, economic and sociological aspects of consumer behavior are studied.

Prerequisites: (MKT 1100 and MKT 1102) or MKT 1103; Pre- or corequisite: ENG 1101

MKT 1214**Advertising**

3 cl hrs, 3 cr

The impact of communications and socio-economic environment on advertising and sales promotion. The nature of promotion policy, organization of advertising professionals, technical production and analysis of the creative strategies used in today's global marketing are thoroughly investigated. The student develops a mock advertising campaign.

Prerequisites: (MKT 1100 and MKT 1102) or MKT 1103; Pre- or corequisite: ENG 1101

MKT 2300**Direct and Interactive Marketing**

3 cl hrs, 3 cr

Management of non-personal promotional methods that are designed to secure immediate response by the customer. Topics include the launching of direct marketing programs, market segmentation, developing products and services, lead generation and media with emphasis on direct mail, broadcasting, telemarketing and new electronic technologies.

Prerequisites: (MKT 1210 and MKT 1214) or BUF 2400

MKT 2327**Entrepreneurship**

3 cl hrs, 3 cr

The student will learn how to adapt established managerial practices to the needs of small business. This will include marketing, finance, human resources, buying and selling and the relationship of these responsibilities in a small business environment. The techniques of entrepreneurial decision-making will be examined in depth.

Students will develop a business plan.

Prerequisites: MKT 1210, MKT 1214

MKT 2373**Supply Chain Management**

3 cl hrs, 3 cr

The movement of goods from production through distribution channels, public versus private warehousing and the interrelationships of inventory control, protective packaging, materials handling equipment and techniques, traffic, communications, order processing and customer service. Centralization vs. decentralization, control of distribution center functions and the impact of electronic data processing on distribution activities are surveyed.

Prerequisites: MKT 1210, MKT 1214

MKT 2410**Marketing Management**

3 cl hrs, 3 cr

Integration of the various marketing activities through sound management decisions; formulation of plans and policies relating to product, price, market research, promotion, advertising, distribution and sales.

Prerequisite: MKT 2300 or MKT 2327

MKT 2414**Sales Management**

3 cl hrs, 3 cr

The application of sales management principles to specific cases. Includes recruiting, selecting, training, motivation, compensation, sales forecasting, territorial development and budgeting.

Prerequisite: MKT 2300 or MKT 2327

Career and Technology Teacher Education

Professor William Edward Roberts, Chair
Midway Building, room M 201
718.260.5373
email: wroberts@citytech.cuny.edu

PROGRAMS:

Career and Technical Teacher Education/BS in Ed
Technology Teacher Education/BS in Ed

FACULTY:

Professor: Nwoke
Assistant Professors: Roberts, Teo, Trinidad

Bachelor of Science in CAREER AND TECHNICAL TEACHER EDUCATION

The Career and Technical Teacher Education program provides students with the required professional knowledge and skills as career technical education subject teachers leading to the initial and professional New York State certifications, New York City licensure and the bachelor's degree in education. Men and women with career and technical backgrounds in such diverse fields as aviation and aerospace maintenance, electrical/electronics, computer technology, graphic arts, construction technology, restorative dentistry, vision care technology and culinary arts, among many others, can complete the baccalaureate program to prepare for teaching positions in public, career and technical education (CTE) and comprehensive high schools, Boards of Cooperative Education Services (BOCES), correctional institutions, private trade schools and for a variety of training positions in industry.

Graduates of the program who wish to advance to supervisory and administrative positions in education can pursue graduate degrees in various areas of education, which are available in The City University of New York or elsewhere.

Several colleges and universities across the country also offer graduate programs for baccalaureate degree holders in career and technical teacher education who wish to pursue careers in college and university teaching. Because entrance requirements differ from one institution to another, those interested in further education should discuss their educational plans with an academic advisor at the earliest opportunity.

Program Mission and Outcomes

Our mission, as urban educators, is to prepare professionally competent, reflective and caring technical educators for a world of technology and diversity. Therefore, every graduate of the program is prepared to demonstrate:

- General Knowledge – based on a strong foundation in the liberal arts and sciences that forms the basis for our shared values, understandings and responsibilities in a democracy.
- Technical Competency – including knowledge and skill in career and technical education content areas to enable students to achieve high standards of learning and performance.
- Professional Competency – based on knowledge of students and proficiency in designing instruction appropriate for their developmental levels and

needs; proficiency in designing, planning, implementing and managing the instructional process in a safe and nurturing environment; and using a variety of methods, assessment techniques and resources.

- Competency in the Use of Technology – ability to use modern computer technology and the Internet to facilitate and enhance the instructional process and student learning.
- Caring Dispositions – personal and interpersonal characteristics that build upon and enhance dispositions to be caring professionals who have respect for learners of every age and background.
- Reflective Practice – critical analysis, evaluation and continuous improvement of professional practice and life-long learning.
- Sensitivity to Diversity – awareness of the diverse cultures that make up our urban schools, communities and our global society; and the basis for practices that support and meet students' learning needs.

Admission into the Career and Technical Teacher Education Program

Students may enter the program as freshmen if they meet the general College criteria for admission. Alternatively, they may transfer from one of the City Tech AAS programs before or after completing the associate degree. Students from other colleges may also apply for admission as transfer students if they meet College criteria for transfer admission. Students with questions are advised to consult the Office of Admissions. An associate degree in career and technical teacher education is not required for admission to the BS in Ed program. Students transferring from other colleges or from programs within City Tech will have their academic records evaluated to determine their appropriate placement in the program. A minimum grade point average of 3.0 is generally required for transfer students. Applicants with grade point averages above 2.5 may be considered.

Regardless of the mode of admission, prospective students must meet CUNY proficiency requirements. To be admitted to teacher education, all applicants must write an essay and must be interviewed by program faculty to determine their eligibility for state certification and potential for success in the program.

Occupational Experience Verification and Competency Validation

All prospective students of the program must be prepared to provide documentation of appropriate work experience in the occupational area for which they will ultimately seek state teaching certification. The duration of occupational experience that will be required depends on the student's previous educational background as follows: high school diploma or equivalent – four years; associate degree or higher in appropriate occupation – two years.

Students who do not meet the work experience requirement but who received appropriate occupational training through a CTE high school or an associate degree program will be required to have a plan for acquiring the required work experience prior to applying for the initial certificate.

Degree-seeking students must also satisfy the content core requirement in order to be eligible for graduation. The content core requirement may be satisfied in any of the following ways:

- Possessing an approved national or state license in the relevant career or technical specialty (for example, NYS Registered Nursing license, NYS Dental Assisting license and the FAA Airframe and Power Plant licenses); or
- Passing the performance and written tests of the National Occupational Competency Testing Institute (NOCTI) in the relevant occupation; or
- Completing at least 30 credits of college coursework at the associate or baccalaureate level in a relevant career or technical specialty.

Progression and Graduation

Students must receive a grade of “B” or better in each course taken with an EDU prefix. Any student earning a grade lower than “B” in an EDU course may not progress in the program without repeating the course and earning a minimum grade of “B or better”. No course in the programs may be repeated more than once without department permission. In the event of failure or a grade of B- or lower the student will be required to change to another major outside the Career & Technology Teacher Education Department.

A minimum grade point average of 2.7 is required both for progression within the Career and Technical Teacher Education curriculum and for enrollment in student internship and student teaching. Students who fall below a 2.7 grade point average are required to arrange a meeting with a Career and Technology Teacher Education Department faculty advisor to discuss plans to improve their academic standing. Students who withdraw will be considered for readmission on an individual basis and only if they withdraw in good standing (passing all courses at time of withdrawal).

Student teaching is required for program completion and a college recommendation for New York State certification. Student teaching applications must be submitted to the teacher education faculty no later than November 30 for student teaching in the spring semester and April 30 for student teaching in the fall semester. A minimum grade point average of 2.7 is required for graduation. Applicants for the New York State teaching certificate must meet the following requirements:

- Initial Certificate – Associate degree or its equivalent in the career, technical, or trade subject area; and passing the New York State Teacher Certification Examinations (NYSTCE)
- Professional Certificate – the Initial Certificate, 45 additional college credits and passing the NYSTCE examinations.

(See the department chair for further information concerning certification examinations.)

GENERAL EDUCATION COMMON CORE 44 CREDITS

I – REQUIRED CORE¹ (4 COURSES, 13 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 3 credits)

MAT 1190	Quantitative Reasoning or higher	3
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Life and Physical Sciences (1 course, 4 credits)

PHYS 1111	Principles of Science I or higher (one year sequence with Scientific World class, below)	4
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II – FLEXIBLE CORE (6 COURSES, 19 CREDITS)

In addition to the required courses listed below, select one course from each of the other three areas; plus one additional course from any of the five areas; no more than two courses may be selected from any discipline. 12

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Individual and Society

PSY 1101	Introduction to Psychology	3
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Creative Expression

Any Approved Course

Scientific World

PHYS 1112	Principles of Science II or higher (one year sequence with Life and Physical Science, above)	4
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III – COLLEGE OPTION REQUIREMENT² (12 CREDITS)

- One course in Speech/Oral Communication
COM 1330 Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course
(any approved course) 3
- Two additional liberal arts courses to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language. 6

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 61 CREDITS

Pedagogical Core (31 Credits)

EDU 2510	Orientation to Career and Technical Education	3
EDU 2520	Occupational Analysis and Curriculum Organization	3
EDU 2354	Laboratory Organization and Management of Instruction	2
EDU 2362	Methods of Teaching in Career and Technology Education	3
EDU 2455	Methods & Materials for Special Needs Students	3
EDU 3630	Assessing Student Learning Outcomes	3
EDU 3640	Computers in Education	3
EDU 3670	Methods of Literacy Instruction in Teacher Education	3
EDU 3681	Internship in Career and Technology Teacher Education	2
EDU 4600	Professional Development Seminar	2
EDU 4871	Supervised Student Teaching in Career and Technology Education	4

Content Core (30 credits)

EDU 3700	Practicum in Occupational Competency: Performance	15
EDU 3720	Practicum in Occupational Competency: Written	15

Program-specific Liberal Arts and Sciences Requirements

MAT 1272	Statistics or higher	3
PHYS 1111	Principles of Science I or higher	Met as GenEd
PHYS 1112	Principles of Science II or higher	Met as GenEd
PSY 2501/	Child and Adolescent Development	3
EDU 2610		

PSY 3502/		
EDU 3610	Human Learning and Instruction	3
SOC 2401	Society, Technology and Self	3
COM 1330	Public Speaking	
or higher		Met as GenEd
ARB, ASL, CHN, FREN, or SPA (Intermediate) ³		3
LIB 1201	Research and Documentation in the Information Age	3
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES		61
TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS		62
TOTAL CREDITS REQUIRED FOR THE DEGREE		123

¹ This program has received a waiver to require particular courses in the Common Core. Students who do not take these courses to meet their GenEd requirements may not be able to complete the degree program within the regular number of credits.

² Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

³ Students can choose to take introductory language courses to satisfy some areas in the Flexible Core/College Option areas. Those who do not may need 3-6 additional credits to complete the degree program.

- Professional Competency – based on knowledge of students and proficiency in designing instruction appropriate for their developmental levels and needs; proficiency in designing, planning, implementing and managing the instructional process in a safe and nurturing environment; and using a variety of methods, assessment techniques and resources.
- Competency in the Use of Technology – ability to use modern computer technology and the Internet to facilitate and enhance the instructional process and student learning.
- Caring Dispositions – personal and interpersonal characteristics that build upon and enhance dispositions to be caring professionals who have respect for learners of every age and background.
- Reflective Practice – critical analysis, evaluation and continuous improvement of professional practice and life-long learning.
- Sensitivity to Diversity – awareness of the diverse cultures that make up our urban schools, communities and our global society; and the basis for practices that support and meet students' learning needs.

Admission into Technology Teacher Education

Students may enter the bachelor of science in education (BSEd) degree program as freshmen if they meet the general College criteria for baccalaureate admissions. [Click here for more information](#). They may transfer in from one of the City Tech AAS, AA or AS programs before or after completing the associate degree. Students may transfer from other colleges if they meet College criteria for transfer admissions. Applicants with questions are advised to consult the Office of Admissions. It is not necessary to have earned an associate degree before transfer into the program. Transcripts of entering students will be evaluated to determine the courses they must complete for the degree. A minimum grade point average of 3.0 is required for transfer into the program. Applicants with a grade point average of above 2.5 may be considered.

Regardless of the mode of admission, prospective students must meet CUNY proficiency requirements. To be admitted to teacher education, all applicants must write an essay and must be interviewed by program faculty to determine their eligibility for state certification and potential for success in the program.

Progression and Graduation

Students must receive a grade of "B" or better in each course taken with an EDU prefix. Any student earning a grade lower than "B" in an EDU course may not progress in the program without repeating the course and earning a minimum grade of "B or better". No course in the programs may be repeated more than once. In the event of failure or a grade of B- or lower the student will be required to change to another major outside the Career & Technology Teacher Education Department.

- A minimum grade point average of 2.7 is required both for progression within the Technology Teacher Education curriculum and for enrollment in student internship and student teaching. Students who fall below a 2.7 grade point average are required to arrange a meeting with a Career and Technology Teacher Education Department faculty advisor to discuss plans to improve their academic standing. Students who withdraw will be considered for readmission on an individual basis and only if they withdraw in good standing (passing all courses at time of withdrawal).

Student teaching is required for program completion and a college recommendation for New York State certification. Student teaching applications must be submitted to the teacher education faculty no later than November 30 for student teaching in the spring semester and April 30 for student teaching in the fall semester. A minimum grade point average of 2.7 is required for graduation. The proposed curriculum requires successful completion of a total of 123 credits distributed as follows: 58 credits of general education (arts and

Bachelor of Science in Education in TECHNOLOGY TEACHER EDUCATION

In technology teacher education, prospective teachers develop the knowledge, skills and dispositions required to teach technology education in kindergarten through 12th grade. Technology education is a comprehensive hands-on program designed to enable students in kindergarten through 12th grade to develop technological literacy. Technological literacy is the ability to develop, use, manage, understand and assess technology.

Although the primary goal of the Technology Teacher Education program is to prepare competent technology teachers, alternate career opportunities exist for graduates of the program. Many graduates have established careers in business and industry, taking advantage of their technical expertise and their liberal arts and professional education with its emphasis on human development and learning. A master's degree is required for the New York State professional certificate as a technology teacher. Graduates of our baccalaureate program in technology teacher education have the opportunity to pursue a master's degree in instructional technology, educational administration and supervision, special education, or other education specialties that are offered at The City University and elsewhere in the country.

Program Mission and Outcomes

Our mission, as urban educators, is to prepare professionally competent, reflective and caring technical educators for a world of technology and diversity. Therefore, every graduate of the program is prepared to demonstrate:

- General Knowledge – based on a strong foundation in the liberal arts and sciences that forms the basis for our shared values, understandings and responsibilities in a democracy.
- Technical Competency – including knowledge and skill in career and technical education content areas to enable students to achieve high standards of learning and performance.

sciences core) courses, 36 credits of technology education content core courses and 29 credits of pedagogical core courses. Students who complete the degree program of study are recommended for the New York State initial teaching certificate. By completing the degree program of study, students also fulfill the NYSTCE requirements. (See the department chair for further information.)

The Transitional C Certificate Program in Technology-Education

The Technology Teacher Education curriculum prepares prospective teacher candidates for the initial teaching certificate through the bachelor of science in education degree program or the professional certificate through the Transitional C Certificate program. The Transitional C program is offered for career changers and others who hold an appropriate graduate academic or professional degree and have been issued a Transitional C certificate. The Transitional C certificate is issued only to candidates who have a written commitment from a hiring school district, which must provide mentoring to the candidate during the first two years of teaching. Candidates must enroll in the intensive program leading to the professional certificate in technology education. In order to receive the professional certificate, candidates must complete three years of teaching and up to 20 semester hours of coursework in the technology education pedagogical core after receiving the Transitional C certificate. They must pass all three New York State Teacher Certification Examinations to qualify for the professional certificate.

- A minimum grade point average of 3.0 is generally required for transfer students. Applicants with a grade point average above 2.5 may be considered.
- No course in the program may be repeated more than once without department permission.
- A minimum grade point average of 2.7 is required both for progression within the Technology Teacher Education curriculum and for enrollment in student internship and student teaching. Students who fall below a 2.7 grade point average are required to arrange a meeting with a Career and Technology Teacher Education Department faculty advisor to discuss plans to improve their academic standing. Students who withdraw will be considered for readmission on an individual basis and only if they withdraw in good standing (passing all courses at time of withdrawal).

The Technology Teacher Education program at New York City College of Technology is accredited by the National Council for Accreditation of Teacher Education (NCATE) and nationally recognized by the International Technology and Engineering Education Association Council on Technology and Engineering Teacher Education (ITEEA-CTETE).

GENERAL EDUCATION COMMON CORE ¹

45-47 CREDITS

I – REQUIRED CORE (4 COURSES, 14-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1275	College Algebra and Trigonometry or higher ²	4
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Life and Physical Sciences (1 course, 4-5 credits)

Select one of the following courses

PHYS 1111	Principles of Science I	4
PHYS 1433	General Physics I: Algebra Based	4
PHYS 1441	General Physics I: Calculus Based	5

II – FLEXIBLE CORE (6 COURSES, 19-20 CREDITS)

In addition to the required course listed below, select one course from each of the other four areas; plus one additional course from any of the five areas; no more than two courses may be selected from any discipline.

15

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Individual and Society

Any Approved Course

Creative Expression

Any Approved Course

Scientific World

Select one of the following courses

PHYS 1112	Principles of Science II	4
PHYS 1434	General Physics II: Algebra Based	4
PHYS 1442	General Physics II: Calculus Based	5

III – COLLEGE OPTION REQUIREMENT³ (12 CREDITS)

- One course in Speech/Oral Communication
COM 1330 Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course
(any approved course) 3
- Two additional liberal arts courses to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language. 6

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

59 CREDITS

Pedagogical Core (26 credits)

EDU 2362	Methods of Teaching in Career and Technology Education	3
EDU 2455	Methods & Materials for Special Needs Students	3
EDU 3410	Technology Education Foundations and Curriculum Development	3
EDU 3630	Assessing Student Learning Outcomes	3
EDU 3640	Computers in Education	3
EDU 3670	Methods of Literacy Instruction in Teacher Education	3
EDU 3681	Internship in Career and Technology Teacher Education	2
EDU 4600	Professional Development Seminar	2
EDU 4871	Supervised Student Teaching in Career and Technology Education	4

Content Core (33 credits)

EDU 1400	Design and Drafting I	2
EDU 1420 ⁴	Construction Systems	3

EDU 2400	Design and Drafting II	2
EDU 2410	Survey of Technological Development	3
EDU 2440 ⁵	Manufacturing Systems	3
EDU 2460 ⁶	Communications Systems	4
EDU 3400	Technological Systems	3
EDU 3420 ⁷	Electronic Systems	4
EDU 3440	Transportation Systems	3
EDU 4480	Principles of Engineering	3
EDU 4440 ⁸	Electronic and Robotic Systems	3
CST 2403	Introductory C++ Programming Language	3
Program-Specific Liberal Arts and Science Requirements		
MAT 1375	Precalculus ⁹	4
PHYS 1111	Principles of Science I	Met as GenEd
PHYS 1433	General Physics I: Algebra Based	
PHYS 1441	General Physics I: Calculus Based	Met as GenEd
PHYS 1112	Principles of Science II	Met as GenEd
PHYS 1434	General Physics II: Algebra Based	
PHYS 1442	General Physics II: Calculus Based	Met as GenEd
PSY 2501/ EDU 2610	Child and Adolescent Development	3
PSY 3502/ EDU 3610	Human Learning and Instruction	3
SOC 2401	Society, Technology and Self	3
COM 1330	Public Speaking or higher	Met as GenEd
ARB, ASL, CHN, FREN, or SPA (Intermediate) ¹⁰		3
LIB 1201	Research and Documentation in the Information Age	3
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES		59
TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS		64-66
TOTAL CREDITS REQUIRED FOR THE DEGREE		123-125

1 This program has received a waiver to require particular courses in the Common Core. Students who do not take these courses to meet their GenEd requirements may not be able to complete the degree program within the regular number of credits.

2 Students without the requisite math background to enter MAT 1275 must take MAT 1175 in preparation; this will increase the number of required credits for the degree by 4.

3 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#). The number of elective credits will vary depending upon students' choices in the Core and College Option areas; choosing a higher credit-hour course may increase the number of credits to graduate by 1.

4 Acceptable substitutes for EDU 1420 are CMCE 1114 and ENT 1110

5 An acceptable substitute for EDU 2440 is both MECH 1101 + MECH 1201

6 An acceptable substitutes for EDU 2460 is COMD 1167

7 Acceptable substitutes for EDU 3420 are EET 1122, ETN 1102, or ETN 1302

8 An acceptable substitute for EDU 4440 is ETN 1302.

9 Students who have already satisfied this requirement may take any elective course to reach a minimum of 123 credits.

10 Students can choose to take introductory language courses to satisfy some areas in the Flexible Core/College Option areas. Those who do not may need 3-6 additional credits to complete the degree program.

Transitional C Certificate Program in TECHNOLOGY EDUCATION

REQUIRED COURSES IN THE MAJOR		CREDITS
EDU 2362	Methods of Teaching in Career and Technology Education I	3
EDU 2455	Methods and Materials for Special Needs	3
EDU 2610	Child and Adolescent Development	3
EDU 3410	Technology Education Foundations and Curriculum Development	3
EDU 3640	Computers in Education	3
EDU 3681	Internship in Career and Technology Teacher Education	2
EDU 4600	Professional Development Seminar	2
EDU 4871	Supervised/Student Teaching in Career and Technology Education	4

Certificate in CAREER AND TECHNICAL TEACHER EDUCATION

The 12-credit program consists of four courses that are part of the baccalaureate degree programs in Career and Technical Teacher Education. Completers of the certificate program will be able to apply for the New York State Initial Certification through the individual evaluation pathway.

REQUIRED COURSES IN THE MAJOR		CREDITS
EDU 2362	Methods of Teaching I	3
EDU 2610	Child and Adolescent Development	3
EDU 2455	Methods and Materials for Special Needs	3

ELECTIVE COURSES

Choose one from the following for 3 credits		2-3
EDU 2510	Orientation to Career and Technical Education	2-3
EDU 2354	Laboratory Organization and Management of Instruction	
EDU 2520	Occupational Analysis and Current Organization	2-3
EDU 3410	Technology Education Foundations and Curriculum Development	
EDU 3610	Human Learning and Instruction	2-3
EDU 3630	Assessing Student Learning Outcomes	
EDU 3640	Computers in Education	2-3
EDU 3650	Mainstreaming in Education	
EDU 3681	Internship in Career and Technology Teacher Education	2-3

TOTAL CREDITS REQUIRED FOR THE CERTIFICATE	11-12
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COURSES:

EDU 1400

Design and Drafting I

2 cl hrs, 2 lab hrs, 2 cr

Use of drafting tools and techniques in the design process. Orthographic projection, sectional views, auxiliary views, basic pictorial drawing, introduction to working drawings, geometric constructions, development of drawing skills and introduction to two-dimensional CAD.

Prerequisite: None (open to CTTE majors only)

EDU 1420

Construction Systems

2 cl hrs, 2 lab hrs, 3 cr

Course is designed to give the student an understanding of construction systems. Laboratory activities include residential structures, foundations, framing, roofing, wiring and plumbing. Safety instruction in middle- and high-school laboratory settings is emphasized.

Prerequisite: None (open to CTTE majors only)

EDU 2354

Laboratory Organization and Management of Instruction

3 cl hrs, 2 cr

Organizational techniques for effective career and technical education instruction. Includes means of record-keeping, laboratory/shop design and maintenance.

Prerequisite: None (open to CTTE majors only)

Equivalent to old course number EDU 2353

EDU 2362

Methods of Teaching in Career and Technology Education I

3 cl hrs, 3 cr

Designing, planning, implementing, and managing the instructional process and engaging students in meaningful learning. Emphasis is on selecting and using a variety of appropriate teaching methods, assessment techniques, and resources, including technology, to meet the needs of all learners.

Prerequisite: None (open to CTTE majors only)

EDU 2400

Design and Drafting II

2 cl hrs, 2 lab hrs, 2 cr

Product design and development, intersections, surface developments, advanced pictorial drawing, cams, perspective drawing, introduction to architectural drawing, two- and three-dimensional CAD.

Prerequisite: EDU 1400

EDU 2410

Survey of Technological Development

2 cl hrs, 2 lab hrs, 3 cr

A hands-on study of the development of technology as related to the advancement of civilization. Activities include research, modeling and/or construction of significant technological systems and devices of the past, present and future.

Prerequisite: EDU 1400

EDU 2440

Manufacturing Systems

2 cl hrs, 2 lab hrs, 3 cr

This course is designed to give the student an understanding of metalworking and manufacturing systems. Laboratory activities include layout techniques, hand and machine cutting, forming, joining, measuring, fabricating and basic machine tool operations.

Prerequisite: EDU 1400

EDU 2455

Methods and Materials for Special Needs Students

3 cl hrs, 3 cr

A review of current methods and materials in working with special needs students. Content includes developmental psychology pertaining to the student population and preparation of individual education plans.

Prerequisite: None (open to CTTE majors only)

EDU 2460

Communications Systems

3 cl hrs, 3 lab hrs, 4 cr

A study of communications systems including photo-offset lithography, desktop publishing, audio production, video production and editing. Cold type composition, silk screen and use of the microcomputer in communications.

Prerequisite: None (open to CTTE majors only)

EDU 2510

Orientation to Career and Technical Education

3 cl hrs, 3 cr

An introductory course providing an overview of career and technical education. Focus on delivery systems, purposes, historical developments and changing occupational patterns.

Prerequisite: None (open to CTTE majors only)

EDU 2520

Occupational Analysis and Curriculum Organization

3 cl hrs, 3 cr

Techniques and applications of analysis, providing a basis for translating occupational knowledge, skills and attitudes into effective teacher-student activities.

Prerequisite: None (open to CTTE majors only)

EDU 2601

Internship in Classroom Teaching I

1 cl hr, 6 field hrs, 1 cr

The first of two semester-long internship experiences designed to expose the pre-service teacher to the classroom environment and to the daily routines of classroom teaching. A minimum of 90 hours of classroom experience in a middle school (grades 5-8) setting including 15 hours working with students with disabilities (with IEPs) is required. Interns must complete a minimum of 6 hours of classroom experience spread over two days per week. The field experience is accompanied by written reports, reflective essays, and scheduled seminars.

Prerequisites: EDU 2362 and department approval is required one semester in advance

Equivalent to old course number EDU 2600.

EDU 2610 or PSY 2501

Child and Adolescent Development

3 cl hrs, 3 cr

Exploration of childhood and adolescent development. Analyses of developmental theories and principles in the areas of perception, cognition, language, personality, social relations, moral behavior and developmental disorders. Emphasis is placed on application of findings in educational settings.

Prerequisite: PSY 1101

EDU 3400

Technological Systems

2 cl hrs, 3 lab hrs, 3 cr

Addresses the "Introduction to 7th Grade Technology" NYS mandate. Hands-on, laboratory-based activities focus on inquiry, science, math, computer applications and social science concepts that underlie technological systems. Emphasis is on student logs and self-assessment techniques.

Prerequisite: EDU 1400

EDU 3410

Technology Education Foundations and Curriculum Development

3 cl hrs, 3 cr

The development of technology education, its aims and objectives. Analysis of the technology education curriculum, instructional resources facilities, management, maintenance, safety and daily routines. Emphasis on New York State Learning Standards for Mathematics, Science and Technology as a source of content.

Prerequisites: Two EDUIED lab courses

EDU 3420

Electronic Systems

2 cl hrs, 3 lab hrs, 4 cr

Study of electricity and electronics including D.C. and A.C., sources, components, circuits, communication and information systems. Techniques for instruction, lab setup, simple lab projects and activities in middle and high school are emphasized.

Prerequisite: EDU 3400

EDU 3440

Transportation Systems

2 cl hrs, 2 lab hrs, 3 cr

A study of the modes of moving goods and people from one location to another. Focuses on the exploration and analysis of basic principles and concepts underlying design and development of various transportation systems. Emphasis is on laboratory design and experimentation activities as well as curriculum implementation in grades K through 12.

Prerequisite: EDU 1400

EDU 3601

Internship in Classroom Teaching II

1 cl hr, 6 field hrs, 1 cr

This second field experience is designed to provide further familiarity with the classroom environment prior to student teaching. A minimum of 90 hours of classroom experience at the adolescent education level (grades 7-12 including 15 hours working with students with disabilities (with IEPs) is required. Interns must complete a minimum of 6 hours of classroom experience spread over two days per week. The field experience is accompanied by written reports, reflective essays, and scheduled seminars.

Prerequisites: EDU 2362 and department approval is required one semester in advance

Equivalent to old course number EDU 3600.

EDU 3610 or PSY 3502**Human Learning and Instruction***3 cl hrs, 3 cr*

Exploration of variables underlying effective instruction. Analyses of learning theories and principles in the areas of classical conditioning and instrumental learning, generalization and discrimination, verbal learning and transfer, short-term and long-term memory, reward and punishment and the effect of motivation on learning.

*Prerequisite: PSY 1101***EDU 3630****Assessing Student Learning Outcomes***3 cl hrs, 3 cr*

A study of traditional and alternative assessment techniques. Provides hands-on experiences on development and administration of assessment instruments and interpretation of assessment data. Using assessment and analysis results to improve instruction.

*Prerequisite: EDU 2362***EDU 3640****Computers in Education***2 cl hrs, 3 lab hrs, 3 cr*

A hands-on computing literacy course on how microcomputers can improve teaching and learning environments. Emphasis is placed on the process of planning, designing and implementing pedagogical techniques that best facilitate student learning. Topics include word processing, spreadsheet and database management systems, interactive multimedia software, Internet and World Wide Web.

*Prerequisite: EDU 2362***EDU 3650****Mainstreaming in Career and Technology Education***3 cl hrs, 3 cr*

An overview of topics, issues and legislation concerning the mainstreamed student within career and technology education settings.

*Prerequisite: EDU 2362***EDU 3670****Methods of Literacy Instruction in Teacher Education***3 cl hrs, 0 lab hrs, 3 cr*

This course prepares teacher candidates for literacy instruction in career and technology and mathematics content areas. Emphasis is on designing and adapting content materials and assessments to help students develop literacy skills and learning strategies.

*Prerequisites: ENG 1121, EDU 2362 or MEDU 1021, EDU 2610***EDU 3681****Internship in Career and Technology Teacher Education***2 cl hrs, 12 field hrs, 2 cr*

A field-based internship experience designed to provide reinforcement for pre-service teacher candidates. Interns must spend at least 15 hours working with students with disabilities.

Students attend scheduled instructional seminars very early in the semester and are observed at a school site on at least three occasions by a college supervisor. A mentor teacher provides on-going support and guidance between observations. Emphasis is placed on developing valid lesson objectives, effective questioning techniques, and the fundamentals of lesson planning and delivery. Monthly logs, reflective essays, participation in seminars, a comprehensive assignment based on field experiences are required.

*Prerequisites: EDU 2520, EDU 2362***EDU 3700****Practicum in Occupational Competency: Performance***1 lab hr, 15 cr*

Students are required to demonstrate a sufficient level of occupational competency by satisfactorily passing a performance examination in the occupational area for which they are seeking certification. Students can receive only the grade of "Satisfactory" or "Unsatisfactory."

*Prerequisite: Appropriate and documented occupational experience and department approval required***EDU 3720****Practicum in Occupational Competency: Written***1 lab hr, 15 cr*

Students are required to demonstrate a sufficient level of occupational competency by satisfactorily passing a written examination in the occupational area for which they are seeking certification. Students can receive only the grade of "Satisfactory" or "Unsatisfactory."

*Prerequisite: Appropriate and documented occupational experience and department approval required***EDU 4440****Electronics and Robotics***2 cl hrs, 2 lab hrs, 3 cr*

An introduction to the study of robotics and industrial automation. This course will provide theoretical and hands-on experience in the areas of design, programming, debugging, set-up and interfacing of industrial robotic applications.

*Prerequisites: EDU 2410, EDU 3400, EDU 3420***EDU 4480****Principles of Engineering***2 cl hrs, 2 lab hrs, 3 cr*

This is a laboratory-based capstone course designed to enable the student teacher to study the relationship among mathematics, science and engineering. Focus is on the integration of the content of these disciplines into the secondary school technology curriculum and to stimulate student interest in pursuing engineering and technology careers.

*Prerequisites: MAT 1375 or higher, PHYS 1112 or PHYS 1434 or PHYS 1442***EDU 4580****Coordination of Work-Based Learning I: Organization***3 cl hrs, 3 cr*

Evaluative, procedural and conceptual approaches to organizing a Diversified Cooperative program within school systems. Emphasis on coordinator's role in construction of training outlines, legal issues and community support.

*Prerequisite: Approval of department chair***EDU 4590****Coordination of Work-Based Learning II: Operations***3 cl hrs, 3 cr*

Implementation of effective program of Diversified Cooperative Work-Study, focusing on student recruitment, placement and supervision, as well as development of employability skills and attitudes.

*Prerequisite: Approval of department chair***EDU 4600****Professional Development Seminar***2 cl hrs, 2 cr*

A series of seminars that accompany the student teaching experience. Seminar topics focus on both the student teaching experience and a broad range of educational issues which form the basis for student reports and reflective essays. The course provides the forum for instruction on special topics mandated in the Regents standards for preparing classroom teachers including identifying and reporting suspected child abuse or maltreatment; preventing child abduction; preventing alcohol, tobacco and other drug abuse; providing safety education; and providing instruction in fire and arson prevention.

*Prerequisites: EDU 3601 or EDU 3681, EDU 2362; Corequisite: EDU 4871***EDU 4871****Supervised/Student Teaching in Career and Technology Education***18 field hrs/wk, 4 cr*

A field-based supervised/student teaching experience mandated in the Regents standards for preparing classroom teachers.

This professional experience is designed to improve and reinforce individual strategies developed during previous field experiences. Emphasis is on instructional planning, implementation, and assessment. Must be accompanied by the professional development seminar, EDU 4600. Requires a minimum of 270 hours of supervised classroom experiences (or 18 hours per week). Prior approval of departmental faculty must be obtained one semester in advance.

*Prerequisites: EDU 2362, EDU 2610/ PSY 2501, EDU 3640, EDU 3681 and (EDU 2455 or EDU 3650); Corequisite: EDU 4600**Equivalent to old course number EDU 4870*

Dental Hygiene

Professor Joycelyn Dillon, Chair
Pearl Building, room P 201
718.260.5070
email: jdillon@citytech.cuny.edu

PROGRAM:

Dental Hygiene/AAS

FACULTY:

Professors: Cohen-Brown, Dillon, Friedman, Lam
Associate Professors: Archer, Cortell, Davide, Dreyer, Nilsen-Kupsch
Assistant Professors: Bilello, Flamer-Caldera, Matthews, Rogers
Lecturer: Childs-Williams

Senior CLT: Mahalko

Associate in Applied Science in DENTAL HYGIENE

A dental hygienist is a licensed member of the dental health team who provides educational, clinical and therapeutic services to the public, according to the individual state Dental Hygiene Practice Act. Patient care provided by the dental hygienist includes collection and assessment of pertinent data, planning and implementation of care and evaluation of the results of treatment.

Dental hygiene students are taught responsibility for professional judgment, ethical conduct and infection control. They learn to develop an effective and responsible style of communication which enables them to involve the patient as a partner in care as a necessary condition for restoring and maintaining the patient's oral health. Students treat a broad range of patients with varied characteristics and health conditions and are given the opportunity to work in a variety of health-care settings with different population groups.

The program includes theory, laboratory and clinical practice and general education courses. Students gain proficiency in clinical skills by treating patients in our on-campus dental hygiene clinic. Satisfactory performance in off-campus affiliated clinics may be required of each candidate for the associate in applied science degree with a major in Dental Hygiene. Computer experience related to dental hygiene practice is also offered. Prior to beginning clinical assignments, students must complete a departmental medical form, provide proof of required immunizations, malpractice insurance and Health Care Provider CPR certification.

Students must complete all requirements for the AAS degree within five years of the date of their matriculation into the dental hygiene curriculum.

In order to practice dental hygiene, graduates are required to pass a National Board Examination on the theory of dental hygiene and a Regional Board Examination on the clinical practice of dental hygiene. Application for licensure must be made to the individual state(s) where the applicant intends to practice.

Among the employers of the graduates of this program are private dental practices, public and private health agencies, hospitals, industrial clinics, government agencies, U.S. Armed Services, schools of dentistry and dental hygiene and dental supply companies.

The following are the dental hygiene program goals:

- Prepares students to become competent oral health clinicians who apply current scientific knowledge and skills toward the prevention of oral diseases.
- Prepares students to be perceptive oral health professionals who motivate clients toward the attainment and maintenance of optimal oral health.
- Encourages students to exercise critical thinking in the development and implementation of patient care.
- Prepares students to serve as dental resource personnel and to assume professional leadership roles in the community.
- Provides opportunities for students to develop interest and participate in professional organizations.
- Encourages students to continue life-long personal, professional and educational growth.
- Provides opportunities for students to transfer to baccalaureate degree programs in dental hygiene and related disciplines.
- Mandates that students apply accepted infection control protocols for prevention of disease transmission in the dental environment and community.
- Provides students with skills to communicate clearly in oral and written presentations.

Criteria for Admission into and Progression within the Dental Hygiene Curriculum

All new and transfer students who do not meet the admissions criteria for direct entry into the clinical program will be classified as pre-clinical dental hygiene students taking introductory courses. During the introductory courses sequence, students will be programmed for developmental skills courses as needed and credit courses in general education and science, which are required for the degree in dental hygiene.

Students will be considered for acceptance into the clinical program each fall if they:

- Are CUNY proficient in writing and math and are proficient at or above the 12th grade level in reading, and
- Have completed all 21-22 required general education credits as delineated in the NYCCT college catalog and departmental literature with at least "C's" in biology and chemistry and a minimum combined average of 2.5. Grades in repeated courses will be averaged.

Completion of the introductory courses does not guarantee progression into the clinical program.

Because of capacity limitations, students who have completed the introductory phase with the minimum 2.5 index or higher will be numerically ranked each semester and seats will be allocated on the basis of the highest cumulative average in the introductory sequence, as space permits. Due to the high number of applicants to the clinical phase of the dental hygiene program in the past two years, the average GPA, for acceptance to the program has been approximately 3.0 or higher.

Progression from Pre-Clinical Dental Hygiene to Clinical Dental Hygiene

After satisfying the prerequisite proficiencies and the required 21-22 introductory course credits, as listed in the statement of requirements with a minimum grade of "C" in the sciences and a cumulative average of 2.5 or better, the student may be admitted to the clinical phase of the dental hygiene program as space permits. Students who have spent a minimum of one semester in introductory course studies at New York City College of Technology may be given preference.

The introductory courses must be completed in a maximum of four semesters after admission to the pre-clinical course sequence of the dental hygiene program. Available seats in the clinical program will be allocated on the basis of the highest cumulative academic averages in the required sequence. Students accepted into the clinical program in the last two years had minimum GPA's of 3.2 and 3.36. Seats will be offered up to the limit authorized by the College. Students who do not meet the above requirements for progression from the pre-clinical sequence to the clinical program by the end of four semesters will be required to transfer out of the dental hygiene curriculum.

Progression in and Graduation from Dental Hygiene

A minimum grade of "C" in each course designated with the prefix DEN will be required for progression in and graduation from the dental hygiene program. DEN 1100 may not be repeated in the event of failure or a grade of D and the student will be required to choose another major. Special conditions of equipment and faculty availability govern the repeating of dental hygiene courses. Course repetition will be permitted only after all students meeting the entrance and progression requirements have been allotted seats. Students who withdraw will be considered for readmission on an individual basis and only if they withdraw in good standing (passing all courses at time of withdrawal).

As per College policy, no dental hygiene course may be repeated more than once. In addition:

- No more than two dental hygiene courses may be repeated during the entire course of study.
- A student may not fail more than one course in any one semester.
- If a student fails to meet any of these provisions, he/she will be required to withdraw from the dental hygiene curriculum.

Additional information on departmental regulations is available in the Dental Hygiene Student Handbook.

Approximate Additional Costs other than Tuition for Four Semesters

Board Examinations.....	\$975
N.Y. State License.....	\$120
Professional Memberships.....	\$120
Instruments and Supplies.....	\$600
Textbooks.....	\$800
Uniforms.....	\$140
Hygiene Pin.....	\$65

GENERAL EDUCATION COMMON CORE ^{1,2}

20-21 CREDITS

I – REQUIRED CORE (3 COURSES, 10-11 CREDITS)

English Composition (1 course, 3 credits)

ENG 1101	English Composition I	3
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Mathematical and Quantitative Reasoning (1 course, 3-4 credits)

MAT 1190	Quantitative Reasoning or higher	3-4
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Life and Physical Sciences (1 course, 4 credits)

BIO 2311	Human Anatomy and Physiology I ³	4
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II – FLEXIBLE CORE (3 COURSES, 10 CREDITS)

Individual and Society

PSY 1101	Introduction to Psychology	3
SOC 1101	Elements of Sociology	3

Scientific World

BIO 2312	Human Anatomy and Physiology II	4
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Writing Intensive Requirement ⁴

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

46 CREDITS

Preclinical Courses

BIO 2311	Human Anatomy and Physiology I	Met as GenEd
BIO 2312	Human Anatomy and Physiology II	Met as GenEd
CHEM 1000	Principles of Chemistry or higher	4
ENG 1101	English Composition I	Met as GenEd
SOC 1101	Sociology	Met as GenEd

Additional Program-Specific Degree Requirements

DEN 1100	Principles of Dental Hygiene Care I	4
DEN 1112	Oral Anatomy	2
DEN 1114	Histology and Embryology	1
DEN 1200	Principles of Dental Hygiene Care II	4
DEN 1217	Periodontics	2
DEN 1218	Dental Radiology	2
DEN 2300	Principles of Dental Hygiene Care III	5
DEN 2311	Oral Pathology	2
DEN 2315	Pharmacology	2
DEN 2318	Dental materials	2
DEN 2400	Principles of Dental Hygiene Care IV	5
DEN 2413	Public Health	2

BIO 3302	Microbiology	4
BIO 3524	Nutrition	2
PSY 1101	Introduction to Psychology	Met as GenEd
COM 1320	Voice and Diction	
	or	
COM 1330	Public Speaking	3
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE CREDITS		46
TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS (PATHWAYS + SURPLUS CREDITS)		20-21
TOTAL CREDITS REQUIRED FOR THE DEGREE		66-67

1 Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education

requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.

2 Specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category. Students are not required to make that choice but should be advised that a different choice may result in additional credits being needed for graduation.

3 Students without the requisite science background for BIO 2311 will be required to take BIO 1101 in preparation. This will increase the number of credits required for the degree by 4.

4 A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

COURSES:

DEN 1100 Principles of Dental Hygiene Care I

(fall only)

2 cl hrs, 6 lab hrs, 4 cr

An introduction to the didactic concepts and clinical techniques and principles involved in the practice of dental hygiene. Emphasis is on the principles of optimal patient care including aseptic techniques, patient assessment, personal oral hygiene and plaque control, fundamentals of instrumentation and related body mechanics, principles of instrument sharpening and emerging modalities. *Prerequisites: CUNY proficiency in reading, writing and mathematics; department approval required; Corequisite: DEN 1112*

DEN 1112 Oral Anatomy

(fall only)

1 cl hr, 3 lab hrs, 2 cr

A study of head and neck anatomy with an emphasis on the structures of the oral cavity. *Prerequisite: CUNY proficiency in reading, writing and mathematics; Corequisite: DEN 1100*

DEN 1114 Histology and Embryology

(fall only for day students; winter only for evening students)

2 lab hrs, 1 cr

Developmental and microscopic anatomy of the elementary tissues. Embryologic development of the teeth and oral cavity. Comprehensive study of teeth, their supporting tissues and microscopic anatomy.

DEN 1200 Principles of Dental Hygiene Care II

(spring only)

2 cl hrs, 8 lab hrs, 4 cr

A continuation of the study of the principles and techniques involved in the practice of dental hygiene as introduced in DEN 1100L. All aspects of adult care will be presented in lectures and in clinical practice. *Prerequisites: DEN 1100, DEN 1112, DEN 1114; Corequisites: DEN 1217, DEN 1218*

DEN 1217 Periodontics

(spring only)

2 cl hr, 2 cr

This course introduces the basic and advanced concepts, as well as current treatment modalities of periodontal therapy.

Prerequisites: DEN 1100, DEN 1112, DEN 1114; Corequisites: DEN 1200, DEN 1218

DEN 1218 Dental Radiology

(spring only)

2 cl hrs, 3 lab hrs, 2 cr

Dental radiology provides the student with the knowledge and experience necessary to work efficiently and safely with x-radiation and radiographic equipment in the dental environment. This course is designed to perfect performance in specific intraoral radiographic techniques and interpretation skills.

Prerequisites: DEN 1100, DEN 1112, DEN 1114; Corequisites: DEN 1200, DEN 1217

DEN 2300 Principles of Dental Hygiene Care III

(fall only)

2 cl hrs, 12 lab hrs, 5 cr

Advanced didactic material and clinical experience. The instructor serves as a group facilitator who assists the student in developing an appreciation for the concepts, topics and procedures related to the clinical experience and in integrating the material into the practice of clinical oral hygiene.

Prerequisites: DEN 1200, DEN 1217, DEN 1218, BIO 3302; Corequisites: DEN 2311, DEN 2318

DEN 2311 Oral Pathology

(fall only)

2 cl hrs, 2 cr

Basic principles of pathology, with special reference to diseases of the oral cavity and contiguous structures and their clinical considerations in dental hygiene treatment.

Prerequisites: DEN 1200, DEN 1217, DEN 1218, BIO 3302; Corequisites: DEN 2300, DEN 2318

DEN 2315 Pharmacology

(fall only for day students, summer only for evening students)

2 cl hrs, 2 cr

Pharmacological action of drugs on functions of the body. Therapeutics of drugs commonly employed in dental practice.

Prerequisites: DEN 1200, DEN 1217, DEN 1218

DEN 2318 Dental Materials

(fall only)

2 cl hrs, 2 lab hrs, 2 cr

The study of sources, physical and chemical characteristics of materials used in dentistry.

Prerequisites: CHEM 1000, DEN 1200; Corequisite: DEN 2300, DEN 2311

DEN 2400 Principles of Dental Hygiene Care IV

(spring only)

2 cl hrs, 12 lab hrs, 5 cr

Continuation of the principles and techniques involved in the practice of dental hygiene as introduced in DEN 1100, DEN 1200 and DEN 2300. Using the knowledge and skills acquired in this and previous semesters, the student will assess each patient assigned, formulate a treatment plan, complete treatment and evaluate results.

Prerequisites: DEN 2300, DEN 2311, DEN 2315, DEN 2318; Corequisites: DEN 2413

DEN 2413 Introduction to Dental Public Health

(spring only)

2 cl hrs, 1 field consultation hr, 2 cr

The dental hygienist's role as an educator and resource person in the field of public and community health is examined. Field experience and participation in dental education programs are included.

Prerequisite: DEN 2300, DEN 2311, DEN 2315, DEN 2318; Corequisite: DEN 2400; Pre- or corequisite: BIO 3524

DEN 3100**Local Infiltration Anesthesia and Nitrous Oxide Analgesia**

30 cl hrs, 15 lab hrs, 2 cr

This comprehensive course for dental hygienists in the State of New York will satisfy the statutory requirements for certification. It will cover the basic concepts of local infiltration anesthesia and nitrous oxide analgesia. In addition, there will be practice of the actual techniques for safe and effective administration and monitoring of local infiltration anesthesia and nitrous oxide analgesia on live patients under direct instructor and dental supervision. Thirteen lecture hours of required, prerequisite information for this course will be presented on-line. This course is given periodically as a continuing education course. It is not required for graduation for the associate degree program or dental hygiene licensure.

Prerequisite: NYS Dental Hygiene License

DEN 3520**Topics in Dental Hygiene**

3 cl hrs, 3 cr

An overview of alternative career pathways for the graduate dental hygienist, reflective of the established industry needs. Students will explore opportunities within the industrial, educational and administrative arenas, as well as review emerging technologies and issues of patient advocacy. This is an advanced course not required for graduation for the associate degree program or dental hygiene licensure.

Prerequisites: DEN 2400, HSA 3510, HSA 4740 or department approval

DEN 3522**Advanced Clinical Practice Seminar**

3 cl hrs, 3 cr

This course will explore advanced concepts in dental hygiene theory and present current research and existing trends in several areas of clinical dental hygiene practice. This is an advanced course not required for graduation for the associate degree program or dental hygiene licensure.

Prerequisites: DEN 2400, HSA 4740

DEN 2700**Dental Hygiene Internship**

(spring only)

1 cl hr, 4 field hrs per week, 2 cr

An elective course offered in the spring semester for second-year dental hygiene students. Department approval required in order to be eligible to enroll in this course. The dental hygiene student will function as an intern for 60 field hours at an area hospital. Depending upon the availability of spaces and hospital

selection, different internship sites will emphasize specific aspects of dentistry. As allowed by the New York State Dental Practice Act, the dental hygiene intern will observe and/or participate in the management of dental patients with complex medical or dental needs, such as dental implants, surgical extractions, biopsies of oral lesions, periodontal surgery and pediatric dental caries.

Prerequisite: Department approval required; Note: DEN 2700 is an elective course. It is not a course required for graduation from the dental hygiene department

Health Services Administration Program

Josef Bohm, Program Coordinator
Midway Building, room M 203
718.260.5957
jbohm@citytech.cuny.edu

PROGRAMS:

Health Services Administration/BS

FACULTY:

Associate Professors: Bohm, Bonsignore
Assistant Professor: Gregory
Lecturer: Rodriguez

Bachelor of Science in HEALTH SERVICES ADMINISTRATION

The bachelor of science (BS) in Health Services Administration, offered through the department of Human Services, prepares you to enter the challenging and fast growing profession of health service management. The US Department of Labor's Bureau of Labor Statistics advises that employment in this field is expected to grow at a faster than average rate of 16% per year. Health care services administration integrates all aspects of health care with administrators often being responsible for the management of facilities and equipment budgets as well as hundreds of employees.

Health Services Administration Program Mission Statement

The New York City College of Technology's Health Service Administration program prepares students for entry-level administrative positions within health service organizations. Representing the interests of a diverse student body; the program gives to students the necessary knowledge, skills and competencies needed for successful career mobility and diversification. The faculty, staff and administration are committed to providing excellence in education through student focused active learning that promotes ongoing self development, ethical conduct, and leadership. The program offers a dynamic learning environment that prepares students for the rigors of employment, encourages their professional growth and inspires a commitment to graduate education and lifelong learning.

Program Description

The bachelor of science in Health Services Administration is a degree for students who have an earned an associate degree in a clinical discipline that enables them to practice as a licensed a health provider. Students with other associates degrees may apply provided the they have the equivalent of two years full time relevant work experience in a health care facility. This degree builds upon students' prior experiences in health care to further prepare them for entry level management positions or advanced graduate studies in fields such as health administration, business, law, or the health professions.

The Health Services Administration program offers an upper-level program designed to develop and expand the career opportunities of associate degree health professionals. The program builds upon the strengths and coursework of the associate degree programs such as dental hygiene, restorative dentistry, nursing, vision care technology, radiologic technology and medical imaging, surgical technology and respiratory therapy, as well as associate degree clinical health professionals in other areas.

Graduates of the Health Services Administration program will be able to:

- Articulate the role of supervisors, managers, directors and administrators in health services organizations.
- Demonstrate entry-level management skills to plan, organize, direct and control the function and processes of a health service organization.
- Apply budget information and financial analysis to making decisions within health service organizations.
- Evaluate laws and policy regulations as well as apply appropriate legal decisions to the administration of health services organizations.
- Collect, interpret and apply data and research findings.
- Exercise proficient communication skills including written and oral communication.
- Engage in formal presentations and demonstrate technology competency with various electronic media.
- Integrate science, mathematics, humanities, critical thinking, information literacy, interpersonal skills and problem solving skills.

Careers

Graduates will be prepared to enter the challenging and fast-growing world of health service management as entry-level administrators in a variety of health care settings. Significant employment opportunities exist for graduates as supervisors, managers and administrators in hospitals, health care agencies, nursing homes, insurance companies, medical/dental clinics and managed care organizations. Alternatively, the program provides students with an excellent foundation should they wish to continue their graduate education in such distinctive fields as health administration, public health and the clinical professions.

A Program with the Working Student in Mind

Students in the Health Service Administration program study in small classes under the guidance of faculty members skilled in administration, finance, research methods, law and information technology. Classes are conveniently scheduled in the evenings and Saturdays. Students make use of state-of-the-art instruction materials and have the availability of the College's significant technological and information resources including:

- A learning management system, BlackBoard®, an interactive Internet-enabled technology connecting students and faculty for on-line learning experiences
- Smart Classrooms for 'hands on' experience and learning opportunities
- A program that emphasizes "process education" where students are encouraged to master self-directed learning.

Faculty members within the Health Services Administration program have comprehensive career backgrounds in administration, public health and professional disciplines. They are dedicated to helping students put together a range of career development skills by working with them from admission to graduation.

Admissions Requirements:

Prerequisites for entering the program are an appropriate associate degree with a minimum grade point average of 2.5 and licensure or certification in a clinical health science discipline or the full-time equivalent of two years employment in a health care setting.

To enter the Health Services Administration program you will need:

An associate degree in a health science program of study with a minimum grade point average of 2.5, and appropriate licensure or certification in hand or pending;

or

An associate degree from a program that has an articulation agreement with the NYCCT HSA program with a minimum grade point average of 2.5;

or

An associate degree with a minimum grade point average of 2.5, and at least two years of alternative work experience in a health care setting or related field as determined by the HSA program coordinator.

Students will meet with a faculty advisor who will review their transcripts to ensure proper placement within the program.

Please contact the admissions office at 718.260.5252 or the transfer office at 718.260.5508 or the HSA program coordinator at 718.260.5957 for more information or an appointment.

Progression in the Health Services Administration Program

As per Health Services Administration program policy:

- A minimum grade of "C" must be earned in each course designated with the prefix HSA.
- No HSA course may be repeated more than once.
- No more than two HSA courses may be repeated during the entire course of study.
- Students must show progression (i.e. maintaining a 2.0 GPA, with no multiple W, WF or WU grades in any courses).

If a student fails to meet any of the above requirements, he/she will be required to withdraw from the HSA curriculum.

Health Services Administration Program

The College will grant a bachelor of science degree with a major in Health Services Administration upon satisfactory completion of a minimum of 120 credits and all required coursework.

The BS in Health Services Administration is a transfer degree for students already holding an associate degree and professional licensure or relevant experience. Entering students will meet with an advisor to determine how their credits may best be used to meet CUNY Pathways Common Core requirements and College/degree-specific requirements. Students in a bachelor of science program are required to earn a minimum of 60 credits in liberal arts and sciences. The program-specific requirements for Health Services Administration include 42 professional credits from a combination of associate degree credits and upper level professional electives and 18 credits of required courses in the major.

GENERAL EDUCATION COMMON CORE¹

42 CREDITS

I – REQUIRED CORE (4 COURSES, 12 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning² (1 course, 3 credits)

Any Approved Course

Life and Physical Sciences³ (1 course, 3 credits)

Any Approved Course

II – FLEXIBLE CORE (6 COURSES, 18 CREDITS)

Select one course from each of the following areas; plus one additional course from any of the five areas; no more than two courses may be selected from any discipline. 18

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Individual and Society

Any Approved Course

Creative Expression

Any Approved Course

Scientific World

Any Approved Course

III – COLLEGE OPTION REQUIREMENT⁴ (4 COURSES, 12 CREDITS)

- One course in Speech/Oral Communication
COM 1330 Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course 3
- Two additional liberal arts courses or in BTech programs, additional liberal arts credits to reach a minimum total of 42 credits in general education.

In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language.

Students transferring with an associate degree are required to take only 6 credits of the College Option, which must include a course in Speech/Oral Communication (unless such a course was already taken at the associate level) and the Interdisciplinary Liberal Arts and Sciences course.

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

Associate-Level Courses in Discipline and Upper-Level Professional Electives⁵ (42 Credits)

PROGRAM-SPECIFIC DEGREE REQUIREMENTS		18 CREDITS
HSA 3510	Health Services Management I	3
HSA 3560	Legal Aspects of Health Care	3
HSA 3602	Health Services Management II	3
HSA 3630	Health Care Finance and Accounting Management	3
HSA 4620	Health Care Information Systems	3
HSA 4740	Health Research Methods	3
Program-Specific Liberal Arts and Sciences Requirements		18 credits
ECON 1101	Macroeconomics	3
ECON 2403	Labor Management Relations	3
MAT 1272	Statistics or higher-level statistics course	3
PHIL 2203	Health Care Ethics	3
PSY 1101	Introduction to Psychology	3
PSY 2404	Personnel and Organizational Psychology	3
Electives to reach 60 credits of Liberal Arts and Sciences credits		
Program-Specific Elective Courses		
(As needed to reach a total of 60 professional credits)		
HSA 4900	Health Services Internship	3

HSA 4910	Introduction to Public Health Administration	3
HSA 4960	Nursing Home Administration	3

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES	60
TOTAL NYS LIBERAL ARTS/SCIENCE CREDITS	60
TOTAL CREDITS REQUIRED FOR THE DEGREE	120

1 Students are strongly urged to consult degree requirements for "double-duty" courses: degree requirements that also meet CUNY Pathways general education requirements in that category. Students are strongly recommended to take MAT 1272 Statistics as part of their liberal arts, as this course is a prerequisite for HSA 4740

2 Students may use any approved or STEM variant mathematics course to meet this requirement; additional credits beyond 3 will be deducted from the total general education requirement for the degree.

3 Students may use any approved or STEM variant science course to meet this requirement; additional credits beyond 3 will be deducted from the total general education requirement for the degree.

4 Complete lists of liberal arts and sciences courses and advanced liberal arts courses, as well as semester-specific lists of interdisciplinary courses and writing intensive courses, are available online at the [City Tech Pathways website](#).

5 Transfer credit to be reviewed with the program coordinator. Where fewer than 42 professional credits are applicable to the degree, students will supplement with additional professional and elective courses approved by the program.

COURSES:

The following HSA courses are open only to students enrolled in the Health Services Administration program, or with approval of the Program Coordinator.

HSA 3510 Health Services Management I

3 cl hrs, 3 cr

Systems for the delivery of health services and related issues will be examined. The course will explore the present and probable future of the industry including the historical shift from a policy system to a market-driven system. Classes are forums of discussion emphasizing contemporary issues related to health care professionals, facilities and organization patterns of both the system and related suppliers and industries.

Prerequisite: Admission to the Health Services Administration program or department approval

HSA 3560 Legal Aspects of Health Care

3 cl hrs, 3 cr

This course will explore ethical and legal issues and their interaction in today's dynamic health care arena. By studying legal principles, decision-making and cases, students will learn to understand, integrate and apply these disciplines in the health arena. *Pre- or corequisite: HSA 3510*

HSA 3602 Health Services Management II

3 cl hrs, 3 cr

Through analysis, discussion and problem-solving in a seminar format, this course will acquaint the student with issues that have an impact on their profession, the health care industry and their role as managers.

Prerequisite: HSA 3510

HSA 3630 Health Care Finance and Accounting Management

3 cl hrs, 3 cr

This course is designed to develop the decision makers' understanding and management of financial information in the health care industry. Emphasis will be placed on concepts that will allow students to understand the huge, complex, and in many ways unique, health care industry.

Prerequisites: HSA 3510 and Completion of Mathematical and Quantitative Reasoning requirement

HSA 4620 Health Care Information Systems

3 cl hrs, 3 cr

This course will provide an in-depth view of the information technology used by the health care industry. HSA 3620 will examine all the components that make up the clinical and administrative information systems in health care

organizations and will give students the information needed to participate in decisions regarding appropriate systems selection and management.

Prerequisite: HSA 3510, HSA 3602

HSA 4740 Health Research Methods

3 cl hrs, 3 cr

This course will provide the student with a background and experience in the research process relevant to the health services field. Health services research is scientific inquiry to produce knowledge about the resources, provision, organizing, financing and policies of the health sector, as well as prevention of disease and current research into health.

Prerequisites: HSA 3602, MAT 1272 or higher-level statistics course

HSA 4900 Health Services Internship

1cl hr, wkly seminar, 105 internship hrs, 3 cr

This course is an elective designed to give students general field experience in a health service organization or in an area of specialization, based on the student's area of interest or professional concentration. Students will have the opportunity to apply their formal education to actual work situations in an effort to ease the transition from the classroom to the work environment. Class hours will focus on the strategic management of health care organizations and the

sharing of information with other participants in the course.

Prerequisites: HSA 3602, HSA 3630 and department approval required

HSA 4910 Introduction to Public Health Administration

3 cl hrs, 3 cr

An overview of issues encountered in the administration of public health programs, integrating knowledge from mathematics, law, human services, and health care administration. Through lectures, discussion, and case studies, students will explore contemporary factors influencing health care policy while building skills in effective communication and administrative decision-making.

Prerequisites: ENG 1101, MAT 1180 or higher, HSA 3510 or HSA program director approval

HSA 4960 Nursing Home Administration

3 cl hrs, 3 cr

Provides students with information related to the organization and administration of long term care services with an emphasis on the structure and functions of nursing homes. The course seeks to orient students to the subject areas within the discipline's certification examination.

*Prerequisite: HSA 3510
Recommended: HSA 3630*

Hospitality Management

Professor Elizabeth Schaible, Chair
Namm Hall, room N 220
718.260.5630
email: eschaible@citytech.cuny.edu

PROGRAMS:

Hospitality Management/AAS
Hospitality Management/BTech

FACULTY:

Professors: Claude, Hoffman, Jordan
Associate Professors: Phillip, Schaible
Assistant Professors: Abreu-Runkel, Akana, Dias, Goodlad, Hellermann,
Kim, Mehrotra, Reid, Stewart, Van Loon, Walljasper, Warner
Lecturers: Lewin-Jacus, Lifrieri-Lowry

Senior CLT: Pernick
CLT: D'Orazi

Associate in Applied Science in HOSPITALITY MANAGEMENT

Founded in 1947, the Hospitality Management Department offers two internationally recognized degree programs for men and women seeking professional preparation for careers in Hospitality Management: a two-year lower-level program leading to the associate in applied science (AAS) degree; a four-year program leading to the bachelor of technology (BTech) degree.

The AAS degree program provides students with a solid foundation in theory and current practices of the hospitality industry and a core of liberal arts and science courses that will prepare them for flexible career development. Students completing the associate degree will be able to:

- Apply basic hospitality-specific technical skills enhanced by integrating general education
- Demonstrate proficiency in the use of basic vocabulary, tools, and concepts of the hospitality industry
- Exhibit effective communication skills
- Develop effective critical thinking skills
- Recognize ethical and socially responsible behavior

Students benefit from studying in small classes under the guidance of professional, industry-oriented faculty and learning in industry-standard facilities. New York City is an added resource to further enhance the dynamic and diversified course offerings. There is an ongoing dedication to community service, and students are encouraged to volunteer their time to enrich the department, the College and the community.

These meaningful and professionally vital opportunities include:

The Anna Nurse Culinary Workshop Series

Each semester, students participate in a series of culinary demonstrations. Current industry professionals, many of whom are alumni, share their expertise and explore trends.

The American Culinary Federation (ACF), Big Apple Junior Chapter

Students may become members of this nationally recognized chefs' organization. Qualified students guided by ACF-member faculty participate in culinary competitions on the local and state levels. Students have the opportunity to participate in community service events and holiday meal preparation for community-based organizations.

Cooks in the Market

Students explore farm-to-table, locavore and seasonal food production concepts and participate in broader community service and outreach events.

The Ambassador Club

The mission of the Ambassador Club is to provide opportunities for students to learn and hone leadership skills with an emphasis on event planning and event management. The Ambassadors will assist in the planning of, and be present at, selected events sponsored by the Hospitality Management Department with the intent of fostering and supporting a welcoming and professional environment.

Hospitality Garden Club

Students volunteer in the Hospitality Garden, growing vegetables for use in culinary classes, and also participate in cooking and pastry demonstrations making use of local seasonal produce.

Aspiring Hotel Leaders

Student club offering opportunities for social interaction and networking with one another and faculty, staff and industry leaders. Club members participate in a variety of activities including hotel tours, workshops, speaker presentations and alumni panel discussions.

Spoons Across America Club

Student members volunteer in NYC public elementary schools and greenmarkets to support experiential food and nutrition initiatives.

The Thomas Ahrens International Programs

The department offers two international programs:

• The Paris Exchange Summer Study Program

The department, in agreement with Université d'Evry-Val d'Essonne, provides a rich and varied learning and living opportunity for qualified students to earn six elective credits in international tourism and traditions of the French table.

• The International Work Program

Selected students spend the summer months working as interns at resorts, hotels and restaurants in the United States and western Europe. Students receive a stipend with the generous support of the NYCCT Foundation and industry associations including Soci   Culinaire Philanthropique, Culinarian's Home Foundation, Jules Weber Foundation, and Paris Gourmet.

All requirements are detailed in a meeting each February. Participating students must have valid passports and, in some cases, visas.

The Walt Disney World College Program

Selected students earn 12 college credits through a balanced learning, living and earning environment in Orlando, Florida, supported by online coursework.

Placement in Hospitality Management Courses

Placement in HMGT courses requires CUNY proficiency in reading, writing and mathematics. Students who do not, upon entrance, pass all three CUNY skills-assessment tests will first be required to take the applicable developmental coursework.

Transfers from Other Departments

Students in any other program in this college who wish to transfer into the Hospitality Management associate degree program must be CUNY proficient in reading, writing and mathematics and must have earned a cumulative average of 2.5 or higher. Space permitting, students meeting these criteria will be accepted.

Transfer Credits

There are great differences in hospitality management course offerings from one college to another. Credit will be granted for courses taken at other colleges if the courses are considered equivalent to those offered at City Tech. Final determination of transfer credits will be made by the Registrar of City Tech and the Chair of the Hospitality Management Department.

Approximate Annual Additional Costs other than Tuition and College-wide Fees

Textbooks	\$800
Supplies/Uniforms/Tools	\$500
Duplicating Expenses	\$75
Professional Memberships	\$100
Periodicals	\$50
Trade Show Admission	\$50
Hotel/Restaurant Visits (including meals)	\$200

Students are required to purchase professional uniforms and tools, as specified by the department.

GENERAL EDUCATION COMMON CORE¹ 21 CREDITS

I – REQUIRED CORE² (4 COURSES, 12 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 3 credits)

MAT 1190 or higher	Quantitative Reasoning	3
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Life and Physical Sciences (1 course, 3 credits)

Any Approved Course		3
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II – FLEXIBLE CORE (3 COURSES, 9 CREDITS)

US Experience in its Diversity

ECON 1101	Macroeconomics	3
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Individual and Society

COM 1330	Public Speaking or higher	3
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One additional course from any group

Any approved course		3
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Writing Intensive Requirement³

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 39 CREDITS

HMGT 1101	Perspectives in Hospitality Management	3
HMGT 1102	Introduction to Food and Beverage Management	3
HMGT 1103	Food Sanitation and Safety Principles	1
HMGT 1105	Lodging Operations Management	3
HMGT 1202	Food and Beverage Cost Control	3
HMGT 1203	Culinary Arts I	3
HMGT 1204	Baking and Pastry Arts I	3
HMGT 2302	Hospitality Accounting	3
HMGT 2303	Culinary Arts II	3
HMGT 2304	Baking and Pastry Arts II	3
HMGT 2305	Dining Room Operations	3
HMGT 2308	Professional Alliances	2
HMGT 2402	Wines and Beverage Management	3
HMGT 2405	Hospitality Marketing	3
ECON 1101	Macroeconomics	Met as GenEd
COM 1330 or higher	Public Speaking	Met as GenEd

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 39

TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS 21

TOTAL CREDITS REQUIRED FOR THE DEGREE 60

¹ Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program

² Specific courses listed are degree requirements that also meet CUNY Pathways general education requirements in that category.

³ A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

Bachelor of Technology in HOSPITALITY MANAGEMENT

Baccalaureate-level coursework builds on the AAS foundation and offers the integration of skills, knowledge and values for professional advancement. Electives allow students to choose an area of focus and deepen their understanding of hospitality management. The BTech degree in Hospitality Management is an internationally accredited program of the Accreditation Commission for Programs in Hospitality Administration (ACPHA). Students completing the baccalaureate degree will:

- Apply hospitality management skills and knowledge, enhanced by integrating general education
- Analyze and evaluate hospitality issues, incorporating diverse local and global perspectives to facilitate effective decision-making
- Demonstrate leadership, interpersonal, communication and team-building skills
- Practice ethical and socially responsible behavior

Alumni have become accomplished as executive chefs, directors of housekeeping, human resources directors, food and beverage directors, restaurant owners, district food service managers, directors of marketing, sales managers, general managers, customer service representatives and travel planners. Students interested in a teaching career may take education courses in career and technical teacher education to become licensed to teach in New York State high school culinary arts programs such as Careers through Culinary Arts Program (C-CAP).

GENERAL EDUCATION COMMON CORE 42 CREDITS

I – REQUIRED CORE¹ (4 COURSES, 12 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101*	English Composition I	3
ENG 1121*	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 3 credits)

MAT 1190* or higher	Quantitative Reasoning	3
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Life and Physical Science (1 course, 3 credits)

Any approved course*		3
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II – FLEXIBLE CORE (6 COURSES, 18 CREDITS)

World Cultures and Global Issues

Any approved course		3
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US Experience in its Diversity

ECON 1101	Macroeconomics*	3
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Individual and Society

Any Approved Course		3
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Creative Expression

Any Approved Course		3
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Scientific World

MAT 1272	Statistics or higher-level statistics	3
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One additional course from any group

Any approved course*		3
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III – COLLEGE OPTION REQUIREMENT² (12 CREDITS)

- One course in Speech/Oral Communication
COM 1330 Public Speaking* or higher 3
- One interdisciplinary Liberal Arts and Sciences course
Any approved course 3
- Additional liberal arts credits to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language 6

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 57 CREDITS

Associate-Level Courses (39 credits)

HMGT 1101	Perspectives in Hospitality Management	3
HMGT 1102	Introduction to Food and Beverage Management	3
HMGT 1103	Food Sanitation and Safety Principles	1
HMGT 1105	Lodging Operations Management	3
HMGT 1202	Food and Beverage Cost Control	3
HMGT 1203	Culinary Arts I	3
HMGT 1204	Baking and Pastry Arts I	3
HMGT 2302	Hospitality Accounting	3
HMGT 2303	Culinary Arts II	3
HMGT 2304	Baking and Pastry Arts II	3
HMGT 2305	Dining Room Operations	3
HMGT 2308	Professional Alliances	2
HMGT 2402	Wines and Beverage Management	3
HMGT 2405	Hospitality Marketing	3

Baccalaureate-Level Courses (18 credits)

HMGT 3501	Hospitality Workforce Management in a Global Marketplace	3
HMGT 3502	Hospitality Management Research Seminar	3
HMGT 3601	Hospitality Management Legal Environment	3
HMGT 3602	Hospitality Management Accounting and Finance	3
HMGT 4702	Hospitality Services Marketing and Management	3
HMGT 4802	Hospitality Management Internship	3
ECON 1101	Macroeconomics	Met as GenEd
MAT 1272	Statistics or higher-level statistics	Met as GenEd
COM 1330	Public Speaking or higher	Met as GenEd

ELECTIVE COURSES (21-26 CREDITS)

Select 12 credits from one or a combination of the following

Areas of Focus	12
HMGT 4900 series:	Hotel and Resort Management Culinary Arts and Pastry Arts Travel and Tourism Food and Beverage Management
EDU series:	Career and Technical Teacher Education
Select additional courses to reach a minimum of 120-125 credits	9-14³
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES	78
TOTAL NYS ED LIBERAL ARTS AND SCIENCE CREDITS	42
TOTAL CREDITS REQUIRED FOR THE DEGREE	120-125³

*Courses required for AAS

1 Specific courses listed are degree requirements that also meet CUNY Pathways general education requirements in that category.

2 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

3 Higher number reflects requirements for students electing the EDU certification.

Admission to the Bachelor of Technology Program

There are many ways a student can enter the bachelor of technology program in Hospitality Management. Students may transfer from the City Tech AAS program in Hospitality Management before or after completing the AAS degree. Students may enter from other City Tech programs or from other colleges if they meet the College criteria for transfer admission. Transcripts of entering transfer students will be evaluated by the Registrar prior to registration. All students admitted to programs of upper-level study in The City University of New York are first required to meet standards of proficiency in reading, writing and mathematics, demonstrated by passing CUNY skills assessment tests, and/or other prescribed CUNY requirements as may be applicable. Students who do not demonstrate the necessary proficiency upon entry must complete developmental courses. Students who have not achieved proficiency in all three areas will be denied access to hospitality management courses.

COURSES:

HMGT 1101 Perspectives in Hospitality Management

3 cl hrs, 3 cr

An overview of the history, likely directions and organizational structure of the hospitality industry and its role in local, national and global economies. Students are introduced to the nature and scope of the hospitality industry, basic terminology, management concepts, career path explorations and the department's mission and culture.

Prerequisite: CUNY proficiency in reading and writing; Corequisite: MAT 0650

HMGT 1102 Introduction to Food and Beverage Management

3 cl hrs, 3 cr

A two-part foundation for food and beverage management, focusing on culinary math and procurement methods. The culinary math component focuses on accurate measurement, portion controls, recipe conversions, product yields and inventory methods. Current market and procurement trends are explored, with an emphasis on product identification.

Prerequisite: CUNY proficiency in reading, writing and mathematics

HMGT 1103 Food Sanitation and Safety Principles

1 cl hr, 1 cr

Through a systems approach, this course focuses on industry standards, sanitation, and risk management and provides students the opportunity for nationally recognized ServSafe® certification.

Prerequisites: CUNY proficiency in reading, writing and mathematics
Equivalent to old course HMGT 4994

HMGT 1105 Lodging Operations Management

3 cl hrs, 3 cr

This Web-enhanced course provides an operational overview of the front office and rooms operations. Students learn management information systems (MIS) terminology and concepts and functions of the rooms division in relation to other key departments within the hotel.

Prerequisite: CUNY proficiency in reading, writing and mathematics

HMGT 1202 Food and Beverage Cost Control

3 cl hrs, 3 cr

Application of cost-control methods, cost/volume/profit relationship to food and beverage revenue. Principles of purchasing, determination of costs over time, inventory turnover rates, portion

controls, forecasting and pre-control methods, comparison of actual and standard costs are topics of discussion.
Prerequisites: HMGT 1101, HMGT 1102

HMGT 1203 Culinary Arts I

1 cl hr, 3.5 lab hrs, 3 cr

Practical application of foundations of culinary terminology and techniques in the professional kitchen. Emphasis on proper use of knives, equipment and utensils in a safe and sanitary manner. Individual and team skills development, organization, timing, recipe structure and flavoring. Development of professional attitude and demeanor.

Prerequisites: HMGT 1101, HMGT 1102, HMGT 1103

HMGT 1204 Baking and Pastry Arts I

1 cl hr, 3.5 lab hrs, 3 cr

Practical application of foundations of baking and pastry terminology and techniques in a professional bake shop. Emphasis on proper use of pastry bag, equipment and utensils in a safe and sanitary manner. Individual and team skills development, organization, timing, recipe structure, ingredients and flavoring. Production of breads for dining room service.

Prerequisites: HMGT 1101, HMGT 1102, HMGT 1103

HMGT 2302 Hospitality Accounting

3 cl hrs, 3 cr

A balance of basic accounting theory and practice tailored to the special needs of hospitality service industries. Study of all phases of the accounting cycle from the transactional analysis to the accountant's worksheet and presentation of financial statements.
Prerequisites: HMGT 1105, HMGT 1202

HMGT 2303 Culinary Arts II

1.5 cl hrs, 4.5 lab hrs, 3 cr

The foundation of culinary terminology and techniques in a production laboratory for dining room service. Basic skills, safety and sanitation procedures, professional demeanor and team interaction are practiced. Students rotate through kitchen stations with appropriate responsibilities developing communication and supervisory skills. Principles of cost control, menu and recipe structure, plating techniques, and flavor profiles are practiced and analyzed.

Prerequisites: HMGT 1202, HMGT 1203

HMG 2304**Baking and Pastry Arts II***2 cl hrs, 3 lab hrs, 3 cr*

Practical application of foundations of pastry terminology and techniques in a professional pastry kitchen. Review of proper use of pastry bag, equipment and utensils in a safe and sanitary manner. Individual and team skills development, organization, timing, recipe structure, ingredients and flavoring. Production of pastry for dining room service including presentation techniques for banquet and à-la-carte.

Prerequisites: HMG 1202, HMG 1204

HMG 2305**Dining Room Operations***1.5 cl hrs, 4.5 lab hrs, 3 cr*

Procedural, customer and staff perspectives involved in the provision of quality service as practiced in a dining room laboratory. Student rotation through dining room service positions with emphasis on responsibilities of planning, producing and evaluating service. Practice of proper safety and sanitation methods. Critique of restaurant service.

Prerequisites: HMG 1105, HMG 1202

HMG 2308**Professional Alliances***2 cl hrs, 2 cr*

The critical role of networking in the hospitality industry and its relation to individual professional development and career goals are explored. Focus on interviewing techniques, preparation of resume and cover letter, development of e-portfolio, and the essentials of business etiquette

Prerequisites: HMG 1105, HMG 1202

Equivalent to old course HMG 2306

HMG 2402**Wines and Beverage Management***3 cl hrs, 3 cr*

Historical introduction to fermented beverages throughout the world. Study of beverage making and tasting procedures including jargon particular to the beverage trade. Basic understanding of geographic, historic, economic and cultural aspects of beverages. Wines – still, sparkling and fortified – are the focus of study. Beers, sake and spirits are introduced. Reinforcement of cost controls and legal responsibilities.

Prerequisites: HMG 2302, HMG 2303

HMG 2405**Hospitality Marketing***3 cl hrs, 3 cr*

Overview of marketing and current topics facing modern hospitality decision-makers. Basic terminology and problem-solving techniques; relationship between marketing and other functions to maximize profits in any size hospitality establishment; basic elements of publicity and public relations, advertising and sales techniques.

Prerequisites: HMG 2302, HMG 2303, HMG 2304

HMG 3501**Hospitality Workforce Management in a Global Marketplace***3 cl hrs, 3 cr*

This course examines the roles of management and leadership in hospitality and other service organizations. The focus will include identifying both challenges and opportunities facing organizations such as responding to globalization, managing workforce diversity, stimulation, innovation and change, improving quality and productivity and other issues relevant to the management of human resources in today's dynamic business climate.

Prerequisites: HMG 2302, HMG 2303, HMG 2304, HMG 2305 or AAS degree in Travel and Tourism or Hospitality Management

HMG 3502**Hospitality Management Research Seminar***3 cl hrs, 3 cr*

Techniques of research and review of literature as applied to hospitality management. Review of computer searching with databases. Interdisciplinary approach to problem-solving and policy development for issues facing hospitality managers. Students research and write an investigative report on a current industry problem.

Prerequisites: HMG 2302, HMG 2303, HMG 2304, HMG 2305 or AAS degree in Travel and Tourism or Hospitality Management

HMG 3601**Hospitality Management Legal Environment***3cl hrs, 3 cr*

Overview of legal implications of acts by hospitality professionals, employees, guests and visitors. Analysis of rights, responsibilities, and risk management of hospitality industry establishments. Discussion of historical and current liability, governmental regulations, predictability and provability in the

environment.

Prerequisites: HMG 2302, HMG 2303, HMG 2304, HMG 2305

HMG 3602**Hospitality Management Accounting and Finance***3 cl hrs, 3 cr*

The needs of management and application of accounting concepts to managerial and financial decision-making, methods and planning; analysis of financial statements; preparing operating and capital budget analysis; principles and techniques for managing cash reserves; ethical and current managerial financial issues.

Prerequisite: HMG 2302

HMG 4702**Hospitality Services Marketing and Management***3 cl hrs, 3 cr*

Relationship among the various components of the hospitality industry and the markets it serves. Study of corporate mission, goals, vision statement, company history, customer perception, environment and social factors as influences on profitability; techniques for analyzing businesses, strategy formation and implementation.

Prerequisites: HMG 3501, HMG 3502, HMG 3602

HMG 4802**Hospitality Management Internship***120 internship hrs, 3 cr*

Work experience in the hospitality field, defined as part-time, supervised employment. Each student is responsible for getting and keeping an appropriate supervisory position for the required period: a minimum of 120 hours for a minimum of eight weeks. Measurable career objectives and related readings are defined in the initial meeting.

Prerequisites: HMG 3501, HMG 3502, HMG 3602

HOTEL AND**RESORT MANAGEMENT****HMG 4951****Lodging Operations Analysis***3 cl hrs, 3 cr*

Building upon the foundation of lodging operations management, students analyze, compare and contrast lodging operations and the diverse as well as dynamic interrelationships between operational and administrative departments. Through a 24-hour "typical day" framework, students will be guided through

learning activities that encompass the various concerns and challenges in managing lodging environments in today's complex and competitive environments.

Prerequisite: AAS degree in Travel and Tourism or Hospitality Management

HMG 4952**Hospitality and Tourism Enterprise Development***3 cl hrs, 3 cr*

This course will explore entrepreneurial opportunities in hospitality and tourism. Financing, branding, business processes, distribution of hospitality and tourism products and services will be examined. Business ownership and legal issues will be analyzed. Students will create a business plan.

Prerequisites: HMG 3501, HMG 3502, HMG 3602; Pre- or corequisite: HMG 4702

HMG 4953**Executive Housekeeping Principles***3 cl hrs, 3 cr*

An overview of the dynamics of housekeeping operations in the hospitality industry. The foundations and applications of staffing, budgeting, purchasing and training will be explored. Special emphasis on financial responsibilities, human resource practices, labor relations, guest relations, operational procedures, cleaning and maintenance, décor and layout, quality control procedures and risk/safety management.

Prerequisite: AAS degree in Travel and Tourism or Hospitality Management

HMG 4955**Facilities Design and Property Management***3 cl hrs, 3 cr*

Analysis of the concepts, principles and procedures in planning and evaluating the design, layout and maintenance of hospitality facilities. Exploration of sustainability-driven hospitality operations and problem solving approaches to engineering and environmental management systems.

Prerequisite: AAS degree in Travel and Tourism or Hospitality Management

HMG 4958**Hotel and Resort Sales***3 cl hrs, 3 cr*

An overview of the principles and techniques of market research as it applies to sales and customer relationship management including marketing and sales strategies development and deployment, day-to-day sales activities and on-going customer relationship management. The relationships between advertising,

public relations, publicity and sales will be explored and analyzed. The role of the salesperson including the establishment of performance objectives, strategies, incentives and evaluation of goal achievements will be analyzed comprehensively.

Prerequisites: AAS degree in *Travel and Tourism* or *Hospitality Management*

HMG 4959 Internship Project

120 internship hrs, 3 cr

Project-based work experience in the hospitality field. Student-initiated, pre-approved project benefiting student career goals as well as providing a necessary service for the workplace or official competition. Project timeline, progress reports, implementation and evaluation are part of the process.

Prerequisite: AAS degree in either *Travel and Tourism* or *Hospitality Management*

CULINARY ARTS AND PASTRY ARTS

HMG 4961 Contemporary Cuisine

1.5 cl hrs, 4.5 lab hrs, 3 cr

Continued development of communication and culinary skills and concepts build on previous courses; students research, plan, produce and evaluate a series of menus; students rotate through kitchen stations with safety and HACCP sanitary standards practiced as a component of supervisory plans of actions; current menu trends – plate presentation, ingredients and flavors – are emphasized in relationship to cost controls, evaluation of food, staff and operations.

Prerequisite: HMG 2303

HMG 4963 Garde Manger

2 cl hrs, 3 lab hrs, 3 cr

Practical application of techniques for decorative production of classical buffet. Industry standards such as aspic, chaud froid, en croute, timbales, pates, galantines, garniture may be included. Elements of color, design, flavor, texture and creativity are factors in the evaluative process.

Prerequisite: HMG 2303

HMG 4965 International Cuisine

1.5 cl hrs, 4.5 lab hrs, 3 cr

Building upon the foundation of previous culinary courses, students will gain a general understanding of international cuisines by

exploring traditional and indigenous ingredients, flavor components and cooking techniques. Application of classical and contemporary cooking techniques, creative menu planning, plate design, cultural research, proper sanitation techniques and nutritional analysis of menus.

Prerequisite: HMG 2303

HMG 4967 Culinary Improvisation

4 lab hrs, 2 cr

Principles and practice of identification, comparison and evaluation of selected foods, ingredients, techniques and equipment for recipe formulation, menu planning and preparation. Examination of current trends in the culinary arts field including the use of local seasonal products and the application of scientific techniques to experiment with food preparation. Emphasis on creatively synthesizing food science, visual arts, flavor nuances, management and performance.

Prerequisite: One of the following: HMG 4961, HMG 4963, HMG 4965, HMG 4968, HMG 4971, HMG 4972 or HMG 4975

HMG 4968 The Art of Vegetarian Cuisine

1 cl hr, 4 lab hrs, 3 cr

Vegetarian cuisine focusing on culinary and dessert preparations utilizing grains, beans, plant proteins, vegetables, and dairy. Through classical and contemporary cooking techniques and styles, meal preparations will concentrate on balanced menus using plant based ingredients that fit into three classifications: vegan, lacto and lacto-ovo vegetarian diets.

Prerequisites: HMG 2303, HMG 2304

HMG 4971 Deluxe Desserts

2 cl hrs, 3 lab hrs, 3 cr

Contemporary dessert production focused on à-la-carte dining room service. Elements of technique, color, design, flavor, texture and creativity are factors in the evaluative process.

Prerequisite: HMG 2304

HMG 4972 Specialty Cakes

1 cl hr, 4 lab hrs, 3 cr

Contemporary and classical cake production encompassing advanced techniques including construction, finishing and decorating cakes based on a weekly theme or technique. Elements of flavor, texture, creativity, design and color are factors in the evaluative process.

Prerequisite: HMG 2304

HMG 4973 Confectionery Arts

2 cl hrs, 3 lab hrs, 3 cr

Practical application of techniques for decorative production of sugar and chocolate. Industry standards such as pastillage, royal icing, caramel, marzipan, nougat, cocoa and food color painting may be included.

Elements of technique, color, design, construction and creativity are factors in the evaluative process.

Prerequisite: HMG 2304

HMG 4975 International Desserts

1 cl hr, 4 lab hrs, 3 cr

This course provides an opportunity to explore the flavors and preparations of international desserts. With practical application and research, students will discover authentic flavor combinations using ingredients of the regions. Techniques, flavor, texture and structure will be discussed in an evaluative process. Students will simulate a pastry shop and rotate into a management position as production chef with responsibilities that include organizing, scheduling, sanitation and evaluating staff performance.

Prerequisite: HMG 2304

HMG 4977 Candies and Bonbons

1 cl hr, 4 lab hrs, 3 cr

Lecture, demonstrations and hands-on production of international confections typically prepared in fine restaurants and pastry shops. Practical application of advanced confectionery techniques will be taught. Proper handling and storage of products will be addressed. Coursework covers chocolate and boiled sugar techniques of confectionery bonbons. Elements of technique, flavor, texture and structure in an evaluative process will be reviewed and discussed. Students rotate into management position as production chef with responsibilities that include organizing, scheduling and evaluating staff performance.

Prerequisite: HMG 2304

HMG 4978 Artisanal Bread

1 cl hr, 4 lab hrs, 3 cr

This course will provide the practical application of advanced bread baking techniques focusing on hearth breads. Using a variety of flours, grains and sours, students will produce hand-shaped artisanal breads from around the world. Student will research artisanal bread trends and create an original bread recipe

Prerequisite: HMG 2304

TRAVEL AND TOURISM

HMG 4981 Geography of Travel and Tourism

3 cl hrs, 3 cr

Physical and cultural factors influencing tourism as well as geographic aspects of international tourism. Location of major attractions related to underlying geographic, social and economic factors.

Prerequisite: AAS degree in *Travel and Tourism* or *Hospitality Management*

HMG 4983 Sustainable Tourism

3 cl hrs, 3 cr

Concepts and techniques for planning tourism facilities at the attraction and destination levels. Exploration of economic, social and geographic factors in selected international locations. Topics such as community-driven planning, tourism resource inventories, urban re-imaging strategies, transportation and environmental planning are discussed.

Prerequisite: AAS degree in *Travel and Tourism* or *Hospitality Management*

HMG 4987 Urban Tourism

3 cl hrs, 3 cr

This course will examine urban tourism as a vehicle of urban renewal and economic regeneration. The roles of government, business and the community will be explored as well as issues of development, management, the environment and social equity. New York City and Brooklyn will be evaluated as models for the development, challenges and opportunities of urban tourism.

Prerequisite: AAS degree in *Travel and Tourism* or *Hospitality Management*

HMG 4988 Parks, Recreation and Sports Management

3 cl hrs, 3 cr

Operation and management of leisure segments of tourism such as parks, commercial and non-profit recreation facilities and sports organizations. History, current trends and likely direction of leisure are explored. Management of resources, visitors and services along with planning and marketing of spectator and participatory sports events and products are highlighted.

Prerequisite: AAS degree in *Travel and Tourism* or *Hospitality Management*

HMGT 4989
Culinary Tourism
1 cl hr, 2 lab hrs, 2 cr

With New York City as a world food culture laboratory, students will explore the concept of culinary tourism and its economic impact on the tourism industry. Students will create, market and conduct their own NYC culinary walking tour.

Prerequisite: AAS degree in Travel and Tourism or Hospitality Management

**FOOD AND BEVERAGE
MANAGEMENT**

HMGT 4901
Restaurant Management
3 cl hrs, 3 cr

History, current and future direction of restaurant management. An overview of restaurant concepts, core values and standard operating procedures including: financial controls, planning, forecasting, legal compliance, and human resources management. Analysis of current trends, marketing and operational technologies.

Prerequisite: AAS degree in Travel and Tourism or Hospitality Management Equivalent to old course HMGT 4991

HMGT 4990
Sustainable Food Systems
3 cl hrs, 3 cr

Examination of contemporary issues surrounding modern food systems in the context of sustainability.

Explorations will include the social, political, and environmental factors that affect urban and rural food systems, and the roles that both the hospitality industry and social policy play in these systems. Course will respond to current topics and issues.

Prerequisites: AAS in Hospitality Management or Travel and Tourism

HMGT 4992
Menu Planning and Design
1 cl hr, 1 cr

Understanding the role of menu planning and design in historic and contemporary terms. Exploration of pricing strategies, design elements, seasonal and theme-based fare, kitchen expertise, market segmentation and customer perceptions.

Prerequisite: HMGT 2303

HMGT 4993
Nutrition for Foodservice Professionals
3 cl hrs, 3 cr

Relationship of food to health from the perspective of the culinary professional. Discussion of the basic elements of nutrition as it relates to menu development, role of

restaurateurs and diverse cultural perspectives on American gastronomy.
Prerequisite: HMGT 2303

HMGT 4995
Wines of France
2 cl hr, 2 cr

This course provides an in-depth evaluation of France's viticulture and vinification. Wine-making methods, service and laws and regulations of the major wine regions of France will be studied. Students will taste and evaluate wines.

Prerequisite: HMGT 2402

HMGT 4996
Wines of Italy
2 cl hr, 2 cr

This course provides an in-depth evaluation of Italy's viticulture and vinification. Wine-making methods, service, laws and regulations of the major wine regions of Italy will be studied. Students will taste and evaluate wines.

Prerequisite: HMGT 2402

HMGT 4997
Wines of the New World
2 cl hr, 2 cr

This course provides an in-depth evaluation of "New World" viticulture and vinification. Wine-making methods, service, laws and regulations of the major wine regions of North America, Australia, New Zealand, Chile, Argentina and South Africa will be studied. Students will taste and evaluate wines.

Prerequisite: HMGT 2402

HMGT 4998
Responsible Beverage Service
1 cl hr, 1 cr

Through a case study approach, this course focuses on industry standards for responsible beverage service. Provides students the opportunity for industry-recognized certification in responsible alcoholic beverage service.

Prerequisite: HMGT 2402 or AAS degree in Travel, Tourism, or Hospitality Management

HMGT 4999
Events Management
3 cl hrs, 3 cr

A practical application of trends in events management. Study of organizing, arranging, operating and evaluating events in the hospitality industry through events participation.

Prerequisite: AAS degree in Travel and Tourism or Hospitality Management

Human Services

Professor Justine Pawlukewicz, Interim Chair
Namm Hall, room N 401
718.260.5135
email: jpawlukewicz@citytech.cuny.edu

PROGRAMS:

Human Services/AAS
Human Services/BS

FACULTY:

Professors: Ayala, Negron, Pawlukewicz, Shepard
Associate Professors: Bonsignore, Garfinkle
Assistant Professors: Cho, Courtney, Diaz, Fernandes, Thorpe, Wong
Lecturer: Powell

HUMAN SERVICES

The Department of Human Services offers two degree programs. The associate in applied science in Human Services provides students with an introduction to the field of human services. The bachelor of science in Human Services prepares students for entry-level positions in human services organizations, as well as graduate school in fields such as social work and counseling.

Associate in Applied Science in HUMAN SERVICES

The associate degree program (AAS) in Human Services is designed to prepare students for entry-level career positions in a variety of human services occupations. The curriculum is based on a solid liberal arts background and includes a full range of human services courses. The program is offered day, evening and weekends.

Program Outcomes

A mission of the Health and Human Services Department is to assist associate and bachelor students in acquiring a human service practice foundation. Graduates of our Human Service programs will be able to demonstrate the following:

- Understanding of the historical development of human services including its impact. Students will be able to analyze and interpret historical data for applications in advocacy and social change.
- Knowledge and application of the theories of the interaction of individual, interpersonal, group, family, organizational, community, and societal systems.
- Ability to analyze and apply theories, knowledge and skills to the scope of conditions that promote or inhibit human functioning to the range of populations served and needs addressed by human services.
- Knowledge and skills in systematic analysis of services and needs; selection of appropriate strategies, services, or interventions; and evaluation of outcomes.
- Knowledge and skills development in information management. Students will be able to analyze and apply information in the

service of clients or client groups through development, design, implementation and evaluation of plans of action.

- Knowledge and skills in direct service delivery and appropriate interventions. Students will be able to demonstrate analysis and application of theory and knowledge bases.
- Interpersonal skills development such as conflict resolution, establishing rapport with clients, and ethical and professional behavior.
- Administrative skills necessary for services delivery such as strategic planning and evaluation, leadership, supervision, budgeting and monitoring, grant and contract negotiations, and compliance with regulatory issues.
- Demonstrate human services values and attitudes and understanding of human services ethics and their application in practice.
- Awareness of their own values, personalities, reaction patterns, interpersonal styles, and limitations.

Students are required to arrange their schedules to complete two semesters of field practicum (250 hours) during the day. (Evening and weekend internships are rare.) Students are expected to use the community-based agencies that have a valid educational contract with the HUS Department. They may use current human services employment, if the educational requirements/contracts are approved, in advance, by the Field Coordinator. Students must attend an orientation seminar during the semester prior to each field practicum course and complete a pre-placement contract for each field course.

Legal residence documentation, criminal background checks, child abuse registry checks, physical examinations, etc. may be required by the agency. The intern will be responsible for these costs if the agency does not pay or reimburse. The cost of travel is also the responsibility of the intern. See the Manual for Human Services Field and Internships for additional information. See the Manual for Human Services Field and Internships for additional information.

Students completing the associate degree program (AAS) in human services commonly find employment as assistant probation officers, social casework assistants, mental health aides, group residence workers, neighborhood outreach workers and job developers. Many graduates of the AAS degree program elect to continue their studies at New York City College of Technology, to earn the bachelor of science in Human Services.

The AAS program is accredited by the Council of Standards in Human Services Education. The Human Services Department is also a member of the National Organization for Human Services and the Mid-Atlantic Consortium of Human Services Education.

Admissions to the Human Services AAS Degree Program:

Students seeking admission to the human services AAS degree program must meet the standards established by the College for freshman or transfer admissions. Candidates are advised to complete the on-line Admissions Application on the college website: www.citytech.cuny.edu.

Readmission/Transfer

Students seeking readmission to the Human Services AAS program and those seeking to transfer to the program from another curriculum or college need to complete the appropriate forms with the Admissions Department of the College. Students are encouraged to seek advisement with a human services faculty advisor. All students seeking advisement must present the most current City Tech transcript and/or transcripts from other colleges. Courses not taken at the transfer college will be required for the AAS degree. A minimum GPA of 2.0 is required for admission to the program.

Criteria for Progression in the AAS Degree Program

Students enrolling in courses with the prefix HUS and HEA must meet the CUNY proficiency requirement in reading and writing. Students must complete a minimum of 60 credits which include the Human Services course requirements to earn their degree.

A minimum grade of "C" in each course with the prefix HUS and HEA is required within the human services curriculum. A student who has earned a grade lower than "C" in any HUS or HEA course must contact the Chairperson in order to repeat that course. For all other courses, the student must contact the Registrar to obtain permission to repeat a course. A course may only be repeated once. Please note that a minimum grade point average of 2.0 is required both for progression within the human services curriculum and for enrollment in a field practicum course. Students who fall below a 2.0 grade point average are required to arrange a meeting with a Human Services Department faculty advisor to discuss plans to improve their academic standing. Advisement hours and other important information are sent to the student's City Tech email regularly and can also be accessed at www.citytech.cuny.edu.

Credit by Examination

Students may apply for three employment credits via the Credit by Examination. If accepted, this would waive the HUS 2305 field practicum I course. Students must arrange a meeting with the Chairperson, at least one semester before meeting the prerequisites for Field Practicum I to discuss eligibility and requirements. Students must complete a Credit by Examination portfolio which includes verification of employment in a position for at least three years with Human Services responsibilities. The portfolio should follow HUS 2305 work which may include various Human Services reports: psychosocial, group summary, community needs assessment, service plan, case management, etc. Applications should be submitted on or by the sixth week of the spring semester in order to enter HUS 2405 Field Practicum II for the following semester. See the Manual for Human Services Field and Internships for additional information.

GENERAL EDUCATION COMMON CORE ¹		24 CREDITS
I – REQUIRED CORE² (4 COURSES, 12 CREDITS)		
English Composition (2 courses, 6 credits)		
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
Mathematical and Quantitative Reasoning (1 course, 3 credits)		
MAT 1190	Quantitative Reasoning or higher	3
Life and Physical Sciences (1 course, 3 credits)		
Any approved course		
II – FLEXIBLE CORE (4 COURSES, 12 CREDITS)		
US Experience in its Diversity		
GOV	Any government course from US Experience in its Diversity	3
Individual and Society		
PSY 1101	Introduction to Psychology	3
SOC	Any sociology course from Individual and Society	3

From the list of approved courses, students will select one 3-credit course from one of the following Pathways categories 3

Creative Expression or

World Cultures and Global Issues or

Scientific World

Writing Intensive Requirement³

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS		36 CREDITS
HUS 1101	Introduction to Human Services	3
HUS 1201	Elements of Counseling	3
HUS 1202	Community Mental Health	3
HUS 1203	Human Services Seminar	3
HUS 1206	Group Dynamics	3
HUS 2305 ⁴	Field Practicum I	3
HUS 2307	Community Organization and Development	3
HUS 2401	Introduction to Gerontology	3
HUS 2405	Field Practicum II	3
Select one of the following four courses:		3
HEA 1102	Community Health	Met as GenEd
HEA 1108	Women's Health Issues	
HEA 1110	Human Sexuality	
HEA 1400	HIV/AIDS ⁵	
GOV	Any government course from US Experience in its Diversity	Met as GenEd
PSY 1101	Introduction to Psychology	Met as GenEd
SOC	Any sociology course from Individual and Society	Met as GenEd
COM 1330	Public Speaking	3
PSY 2300	Developmental Psychology or higher	3
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES		36
TOTAL PATHWAYS COMMON CORE CREDITS		24
TOTAL CREDITS REQUIRED FOR THE DEGREE		60
TOTAL NYS LIBERAL ARTS/SCIENCE CREDITS		30

1. Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program

2. Specific courses listed are degree requirements that also meet CUNY Pathways general education requirements in that category.

3. A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

4. See Credit by Examination.

5. HEA 1400 is not a liberal arts class. When it is chosen, the total number of liberal arts and sciences credits will be reduced to 27.

Bachelor of Science in HUMAN SERVICES

The baccalaureate program in Human Services prepares students for mid-level career positions in any social welfare agency. This includes positions such as case manager, social services supervisor, senior center director, job counselor, child welfare worker, group residence director/supervisor, information and referral specialist, outreach worker, public health worker, mental health associate, substance abuse counselor, vocational counselor, probation and parole officer.

Program Outcomes

A mission of the Health and Human Services Department is to assist associate and bachelor students in acquiring a human service practice foundation. Graduates of our Human Service programs will be able to demonstrate the following:

- Understanding of the historical development of human services including its impact. Students will be able to analyze and interpret historical data for applications in advocacy and social change.
- Knowledge and application of the theories of the interaction of individual, interpersonal, group, family, organizational, community, and societal systems.
- Ability to analyze and apply theories, knowledge and skills to the scope of conditions that promote or inhibit human functioning to the range of populations served and needs addressed by human services.
- Knowledge and skills in systematic analysis of services and needs; selection of appropriate strategies, services, or interventions; and evaluation of outcomes.
- Knowledge and skills development in information management. Students will be able to analyze and apply information in the service of clients or client groups through development, design, implementation and evaluation of plans of action.
- Knowledge and skills in direct service delivery and appropriate interventions. Students will be able to demonstrate analysis and application of theory and knowledge bases.
- Interpersonal skills development such as conflict resolution, establishing rapport with clients, and ethical and professional behavior.
- Administrative skills necessary for services delivery such as strategic planning and evaluation, leadership, supervision, budgeting and monitoring, grant and contract negotiations, and compliance with regulatory issues.
- Demonstrate human services values and attitudes and understanding of human services ethics and their application in practice.
- Awareness of their own values, personalities, reaction patterns, interpersonal styles, and limitations.

In addition, graduates of the human services program are prepared to pursue graduate-level education in a number of professional areas. Students continue their professional development by applying to Master's level programs in social work, counseling, gerontology, criminal justice, psychology, guidance, rehabilitation, occupational therapy, vocational therapy and public health and administration. Employers of

human services graduates include but are not limited to state, city and community organizations.

The bachelor of science program is accredited and a member of the Council of Standards in Human Services Education, the National Organization for Human Services and the Mid-Atlantic Consortium of Human Services.

Requirements for Admission, Placement and Progression within the Human Services BS Degree Program

The City Tech BS degree in human services is the only such baccalaureate program offered at CUNY. Baccalaureate degree students study counseling skills, case management, group work practice, grants, funding, volunteerism and research as well as the health and counseling of specific populations including gerontology, disabilities, additions, children and families.

Students are required to arrange their schedules to complete two semesters of internship (400 hours) during the day. (Evening and weekend internships are rare). Students are expected to use community-based agencies that have a valid educational contract with the Human Services Department. They may use current human services employment, if the educational requirements/contracts are approved, in advance, by the Field Coordinator. Students must attend an orientation seminar during the semester prior to each internship course and complete a pre-placement contract for each internship course. Legal residence documentation, criminal background checks, child abuse registry checks, physical examinations, etc. may be required by the agency. The intern will be responsible for these costs if the agency does not pay or reimburse. The cost of travel will also be the responsibility of the intern. See the Manual for Human Services Field and Internships for additional information.

A minimum grade of "C" in each course with the prefix HUS and HEA is required within the human services curriculum. A student who has earned a grade lower than "C" in any HUS or HEA course must contact the Chairperson in order to repeat that course. For all other courses, the student must contact the Registrar to obtain permission to repeat a course. A course may only be repeated once. Please note that a minimum grade point average of 2.0 is required both for progression within the human services curriculum and for enrollment in a field practicum course. Students who fall below a 2.0 grade point average are required to arrange a meeting with a Human Services Department faculty advisor to discuss plans to improve their academic standing. Advisement hours and other important information is sent to the student's City Tech email regularly and can also be accessed at www.citytech.cuny.edu.

Students may apply to enter the BS program in the following ways:

- As freshmen, if they meet college requirements for freshman admission into baccalaureate programs.
- Current Associate students can transfer their academic status to the HUS bachelor's degree by completing a Change of Curriculum Form with a HUS faculty advisor. It is suggested that the change of curriculum from the AAS to the BS be completed prior to the student completing 45 credits.
- As transfers from another curriculum or college with an AAS degree in human services where 60 credits will be transferred and distributed into the HUS associate and baccalaureate required courses. Students

should consult a faculty advisor to review course distribution in each of City Tech's HUS programs. Students with an associate degree in human services can immediately register for HUS/HEA bachelor courses. Students will maintain their earned associate degree, and are not required to register for HUS/HEA courses in the associate degree. However, students are required to complete 120 credits towards the bachelor's degree, which includes various core/liberal arts requirements. [Click here](#) for BS core requirements.

- Transfer students with an AAS, AA or AS in another discipline may receive 60 credits towards the BS degree but will be required to complete HUS 2305 before enrolling in upper-division HUS courses. A Change of Curriculum Form and consultation with a HUS faculty advisor is required. A minimum GPA of 2.0 is required for admission to the program

Students with questions are advised to consult the Office of Admissions at 718.260.5500 or by email to admissions@citytech.cuny.edu. Transcripts of entering students will be evaluated by the Transfer Office to determine the courses they must complete for the bachelor of science degree. Please consult with a HUS department faculty advisor for further information.

The College will grant a bachelor of science (BS) degree with a major in Human Services upon satisfactory completion of a minimum of 120/121 credits.

GENERAL EDUCATION COMMON CORE ¹		42 CREDITS
I – REQUIRED CORE ² (4 COURSES, 12 CREDITS)		
English Composition (2 courses, 6 credits)		
ENG 1101 *	English Composition I	3
ENG 1121 *	English Composition II	3
Mathematical and Quantitative Reasoning (1 course, 3 credits)		
MAT 1190	Quantitative Reasoning or higher *	3
Life and Physical Sciences (1 course, 3 credits)		
Any approved course		
II – FLEXIBLE CORE (6 COURSES, 18 CREDITS)		
In addition to the required courses listed below, select one course from each of the other three areas; no more than two courses may be selected from any discipline.		9
World Cultures and Global Issues ³		
Any Approved Course		
US Experience in its Diversity		
GOV	Any government course in US Experience in its Diversity recommended	3
Individual and Society		
PSY 1101*	Introduction to Psychology recommended	3
Creative Expression ³		
Any Approved Course		
Scientific World ³		
Any Approved Course		

One additional course from any Flexible Core area

SOC * Sociology course in Individual and Society recommended 3

III – COLLEGE OPTION REQUIREMENT ⁴ (12 CREDITS)

- One course in Speech/Oral Communication
COM 1330 Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course
Any approved course 3
- Two additional liberal arts courses or in BTech programs, additional liberal arts credits to reach a minimum total of 42 credits in general education.

In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language ⁵. 6

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 66 CREDITS

Associate-Level Courses (30 credits)

HUS 1101	Introduction to Human Services	3
HUS 1201	Elements of Counseling	3
HUS 1202	Community Mental Health	3
HUS 1203	Human Services Seminar	3
HUS 1206	Group Dynamics	3
HUS 2305 ⁶	Field Practicum I	3
HUS 2307	Community Organization and Development	3
HUS 2401	Introduction to Gerontology	3
HUS 2405	Field Practicum II	3
Select one of the following four courses ⁷ :		3
HEA 1102	Community Health	or
HEA 1108	Women's Health Issues	
HEA 1110	Human Sexuality	
HEA 1400	HIV/AIDS ⁷	

Baccalaureate-Level Courses (36 credits)

HUS 3501	Counseling Methods	3
HUS 3503	Case Management	3
HUS 3504	Group Work Practice	3
Select one of the following HEA 35XX courses for 3 credits:		3
HEA 3502	Drugs and Personal Health	or
HEA 3505	Health Issues of Children and Adolescents	
HEA 3507	Trauma-Informed Practice	or
HEA 3508	Health and Mental Health Issues with Vulnerable Populations Across the Life Span	
HEA 3510	Social Welfare Policy and Program	or

Select one of the following HUS 36XX courses for 3 credits:			3
HUS 3602	Alcohol and Substance Abuse Treatment		
	or		
HUS 3605	Child Welfare and Family Services		
	or		
HUS 3620	Supervision in Human Services		
	or		
HUS 3608	Human Services Practice with Vulnerable Populations Across the Life Span		
	or		
HUS 3609	Human Services and the Criminal Justice System		
HUS 3610	Research Methods in Human Services		3
HUS 4700	Professional Internship I		3
HUS 4801	Professional Internship II		4
HUS 4802	Volunteerism		2
HUS 4803	Resource Development in Human Services		3
HUS 4804	Management Concepts in Human Services		3
MAT 1272	Statistics ⁶		3
Additional Program-Specific Required Courses			
GOV*	Any government course in US Experience in its Diversity	Met as GenEd	
PSY 1101*	Introduction to Psychology	Met as GenEd	
PSY 2300*	Developmental Psychology or higher		3
SOC	Any sociology course in Individual and Society	Met as GenEd	

Additional credits as needed to reach minimum of 120 total credits including 60 Liberal Arts and Sciences credits

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES	60
TOTAL NYS LIBERAL ARTS AND SCIENCES CREDITS	60
TOTAL CREDITS REQUIRED FOR THE DEGREE	120

* Courses required for AAS

1 The BS in Human Services is built on the AAS in Human Services using a 2+2 model. Courses required for the AAS in Human Services at New York City College of Technology are indicated by *. Requirements for transfer students from CUNY institutions will be governed by CUNY Pathways policy and existing articulation agreements. Transfers from outside of CUNY will be evaluated individually.

2 Students are strongly urged to consult degree requirements for "double-duty" courses: degree requirements that also meet CUNY Pathways general education requirements in that category.

3 Students in the AAS program in Human Services are required to take one course in World Cultures and Global Issues, Creative Expression or Scientific World

4 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

5 Students in bachelor of science programs must take additional liberal arts and sciences courses to reach a minimum of 60 credits.

6 See Credit by Examination

7 These HEA courses and MAT 1272 meet NYS Liberal Arts and Sciences requirements Except for HEA 1400, which is not a liberal arts and sciences class. Students who take HEA 1400 may need three additional credits to graduate.

COURSES:

HEA 1102 Community Health

3 cl hrs, 3 cr

Newest developments in public health on federal, state and local levels including medical care, chronic and communicable diseases, mental health, sexually transmitted diseases including AIDS, environmental health, epidemiological investigation and research, maternal and child health, population control and health service careers.

Prerequisite: CUNY proficiency in reading and writing

HEA 1108 Women's Health Issues

3 cl hrs, 3 cr

A study of the health concepts specific to women. Life-style behaviors, violence against women, sexuality and reproductive issues, fertility, the older years, specific health and medical problems. Politics and economics of medical care, resources for prevention, self-help and treatment.

Prerequisite: CUNY proficiency in reading and writing

HEA 1110 Human Sexuality

3 cl hrs, 3 cr

An overview of sex and sexuality in today's society. Birth control,

conception, anatomy, physiology of human sexual responses, STD's, sexual dysfunctions and other related topics. *Prerequisite: CUNY proficiency in reading and writing*

HEA 1400 HIV/AIDS

3 cl hrs, 3 cr

An interdisciplinary study of the effect of HIV (Human Immunodeficiency Virus) on the human body and mind, and the impact of the AIDS epidemic on our society. Issues of transmission, testing, counseling, prevention, treatment and various community responses are included, with special reference to the workers in the health care system. 45 CASAC hours
Prerequisite: CUNY proficiency in reading and writing

HEA 1199 Patient Care Navigation in Community Health

3 cl hrs, 3 cr

New health care delivery systems call for greater coordination of care, particularly case management for patients with complex medical needs. Patient care navigators (PCN), also called case managers, work with physicians to ensure that their patients maintain the regimens and

medications needed to improve their health. This course in community health covers such topics as chronic diseases, the role of culture and values in creating health care disparities, health coaching, patient care, motivational interviewing and skills needed to work with patients in treatment. This experimental course is for 1199 students only.

HEA 2112ID The Evolving Face of Race, Class and Gender Identity College Option: Interdisciplinary

3 cl hrs, 3 cr

Using internal colonialism as an analytical construct, this course examines the socio-historical, cultural conditions, and gender constructs of marginalized cultural and racial groups in America. A special focus is on Blacks and other Indigenous cultures and populations, such as Native Americans and Mexican Americans. Topics include, but are not limited to, the following: slavery/genocide, racial/cultural blending, integration/segregation, economic deprivation, the impact of public health and mental health and shifts in gender identity and cultural roles.

Prerequisite: ENG 1101

HEA 3502 Drugs and Personal Health: Their Use and Abuse

(for human services students only)

3 cl hrs, 3 cr

Ramifications of the use of various chemical substances; effects of drugs, legal and illegal, on personal health; current methods in rehabilitation of drug users. 45 CASAC hours
Pre- or corequisite: HUS 2405

HEA 3505 Health Issues of Children and Adolescents

(for human services students only)

3 cl hrs, 3 cr

A comprehensive study of the developmental stages of infants, children and adolescents. Areas explored are critical health and safety issues and problems affecting different age groups. Other topics include nutrition, personal hygiene, medical care, first aid and safety, CPR, mental health, HIV and AIDS, sexually transmitted diseases, chronic and communicable diseases, sexuality and birth control.

Pre- or corequisite: HUS 2405

HEA 3507 Trauma-Informed Practice

3 cl hrs, 3 cr

Effects of trauma on individuals, families, communities and societies

examined in relation to the human service profession. Effective, trauma-informed, evidence-based practices for human service professionals that promote recovery and healing are presented, along with coping skills, resilience and the importance of human service professional self-care.
Pre- or corequisite: HUS 2405

HEA 3508 Health and Mental Health Issues With Vulnerable Populations Across the Life Span

3 cl hrs, 3 cr

This course is designed to enable students to understand various health and mental health problems across the life span. It reflects the current health issues that include medical diagnoses, physical symptoms and interventions. This course will examine social welfare policies and programs to address health and mental health on a continuance of care with an emphasis on prevention.

Pre- or corequisite: HUS 2405

HEA 3510 Social Welfare Policy and Program: Analysis for Human Services

3 cl hrs, 3 cr

Review of social welfare policies and programs to define and utilize multiple analytical frameworks of organizational, political, judicial and economic principles on social welfare policies. Societal response to endemic, systemic and acute/localized needs and problems will be scrutinized to promote the development of creative and unique societal response methodologies within human services.
Pre- or corequisite: HUS 2405

HUS 1101 Introduction to Human Services

3 cl hrs, 3 cr

An overview and introduction to social welfare and human services in the United States. The profession of human services, its knowledge base, values and skills. Major topics covered are historical background, human services practice, social services, special issues and populations.
Prerequisite: CUNY proficiency in reading and writing

HUS 1201 Elements of Counseling

3 cl hrs, 3 cr

An introduction to the major theories which underlie contemporary counseling. The student becomes acquainted with the skills and personal attributes necessary for the practice of counseling.

Pre- or corequisite: HUS 1101

HUS 1202 Community Mental Health

3 cl hrs, 3 cr

An in-depth examination of community mental health services currently being provided under public, voluntary and private auspices. History, techniques, successes and failures of the community mental health movement. Students research a community project.

Pre- or corequisite: HUS 1101

HUS 1203 Human Services Seminar

3 cl hrs, 3 cr

An introduction to the assessment of multiple vulnerable populations, use of supervision, ethical policies, professionalism, and cultural considerations oriented toward working in a community-based agency. The course provides the crucial elements for the design of a professional portfolio.
Pre- or corequisite: HUS 1101

HUS 1206 Group Dynamics

3 cl hrs, 3 cr

An in-depth examination of groups and how individuals influence and are influenced by group processes. Role playing and group observation assignments provide students with understanding of themselves as group participants and ways of using group procedures in the helping processes.
Pre- or corequisite: HUS 1101

HUS 2305 Human Services Field Practicum I

9 cl hrs, 2 days field work per week, 3 cr

Supervised field work in a cooperating social or health agency coordinated with weekly classroom seminar. Students prepare written reports on a series of assigned readings and keep a written journal of their field practicum experiences. A GPA of 2.0 or better is required for enrollment. Students must attend an orientation seminar the prior semester for each course.

Prerequisites: HUS 1201, HUS 1203, ENG 1101 and proficiency in mathematics

HUS 2307 Community Organization and Development

3 cl hrs, 3 cr

Community organization theory and practice in human services. History and development of community organizing for social and human services are emphasized. Planning techniques of organizations in the profit, not-for-profit and governmental sectors and the processes affecting change in human service organizations. Case presentations, group projects and community reports are required.
Prerequisite: HUS 1101

HUS 2401 Introduction to Gerontology

3 cl hrs, 3 cr

Aging examined from sociological, psychological, biological and ethnic perspectives. Effects of these factors upon the treatment of the elderly in our society. Term project required.
Prerequisite: HUS 1101

HUS 2405 Human Services Field Practicum II

9 cl hrs, 2 days field work per week, 3 cr

Supervised field work in a cooperating social or health agency coordinated with weekly classroom seminar. Students prepare written reports on a series of assigned readings and keep a written journal of their field practicum experiences. A GPA of 2.0 or better is required for enrollment. Students must attend an orientation seminar the prior semester for each course.

Prerequisite: HUS 2305; pre-or corequisite: ENG 1121

HUS 3100 Interprofessional Communication, Collaboration and Quality Care in Health and Human Services

3 cl hrs, 3 cr

This interprofessional course for students in upper division baccalaureate programs in health and human services professions is designed to prepare students for the critical necessity of interprofessional communication and collaboration within health care settings. Students participate in health-related simulation and technology aided exercises to explore the roles of various health professionals. They learn how they can collaboratively influence patient care, safety, overall health, and the promotion of well-being outcomes.
Prerequisite: Allied health associate degree or admission to one of the baccalaureate-granting programs in Nursing, Radiologic Sciences, Human Services, or Health Services Administration

HUS 3501 Counseling Methods

3 cl hrs, 3 cr

Builds on prior knowledge of counseling and psychotherapy theories. Focus is on the development of practice skills used in human services agencies.

Pre- or corequisite: HUS 2405

HUS 3503 Case Management

3 cl hrs, 3 cr

An introduction to the role and function of the case manager in human services agencies including those servicing dependent populations such as the disabled and

physically challenged, the frail elderly and the psychiatric homebound. Record keeping, agency reporting procedures and brokering of services are emphasized.

Pre- or corequisite: HUS 2405

HUS 3504 Group Work Practice

3 cl hrs, 3 cr

Builds on theories of small group behavior established in HUS 1206 Group Dynamics. Application of theory from the earlier course to help students develop skills in group design and formation utilizing the stages of group development. Special consideration is given to a variety of groups and populations.

Pre- or corequisite: HUS 2405

HUS 3602 Alcohol and Substance Abuse Treatment

3 cl hrs, 3 cr

A presentation of a variety of multi-disciplinary approaches to the treatment of alcohol and substance abuse. Acquaints students with the impact of substance abuse on systems in human services and enables students to understand the impact of substance abuse on the individual and the family. Students learn to use a variety of resources for the prevention and treatment of alcohol and substance abuse.

Pre- or corequisite: HUS 2405

HUS 3605 Child Welfare and Family Services

3 cl hrs, 3 cr

Concepts, policies, practice principles and issues in the broad fields of child welfare and family services. The major human services policies and programs designed for children and families at risk are examined. A broad eclectic practical framework with a variety of intervention methods and techniques for bringing about positive changes in children, adolescents and families are presented and examined.

Pre- or corequisite: HUS 2405

HUS 3606 Assessment, Evaluation and Treatment Planning for Alcohol and Substance Abusing Clients

3 cl hrs, 3 cr

Introduces students to the comprehensive assessment, evaluation and treatment-planning model utilized with alcohol and substance abusing clients. Provides students with the knowledge and skill to conduct a screening or intake interview both for individuals and families, utilizing appropriate screening instruments for assessing alcohol and substance abuse. In addition, students become familiar

with a suicide assessment format, a mental status exam and the DSM IV Diagnostic and Statistical Manual of Mental Disorders. The scope of the course includes culturally sensitive assessment and treatment planning related to African Americans, Latinos, adolescents, gay men and women, older adults and the cognitively and physically disabled.
Prerequisites: None

HUS 3607
Strategies and Intervention with Alcohol and Substance Abusing Populations

3 cl hrs, 3 cr

An overview of the most commonly used drugs and review of the theories of how substance abuse problems commence. Explores different models of primary, secondary and tertiary prevention to include community education strategies as well as treatment approaches, using self-help groups as a foundation of recovery. Students learn to understand and appreciate the use of the 12 steps as well as self-help programs in working with clients. Helps students plan intervention strategies for diverse populations inclusive of cultural and ethnic differences, and special populations such as adolescents, senior citizens, the disabled, women, gay and lesbian clients.

Prerequisites: None

HUS 3608
Human Services Practice with Vulnerable Populations Across the Life Span

3 cl hrs, 3 cr

This course is designed to enable students to understand and apply theories and principles of intervention to specific life situations of vulnerable populations in the community as well as in institutions. Students will learn specialized skills in assessment, service settings, implementation and evaluation of programs. The role of the human services professional will emphasize linkages to formal and informal support networks. Role playing, case discussions, life reviews, agency field visits and audio visual aids may be used as an integral part of class. This course will prepare individuals interested in a career working in settings such as Mental Health Clinics, Residential and Development Treatment Centers, Nursing Homes, Residential Health Care Facilities and Inpatient Facilities.
Pre- or corequisite: HUS 2405

HUS 3609
Human Services and the Criminal Justice System

3 cl hrs, 0 lab hrs, 3 cr

An introduction to the criminal justice system from the perspective

of human services. The course will provide a basic foundation in current issues facing individuals who work in criminal justice as well as exposure to the roots of crime, incarceration and effective rehabilitation of individuals who return to society. Emphasis is on the prevention of criminality, aspects of recidivism and re-entry.

Pre- or corequisite: HUS 2405

HUS 3610
Research Methods in Human Services

2 cl hrs, 2 lab hrs, 3 cr

An introduction to the vocabulary of social research, the logic of social inquiry and the analysis and use of research methods for human services practice. The application of social research methods to problem-solving in the human services, and the application of research findings to social welfare policy and human services practice.

Pre- or corequisites: HUS 2305, MAT 1272 and demonstration of computer literacy

HUS 3611
Ethical and Professional Responsibilities for Human Service Workers and Chemical Dependency Professionals

3 cl hrs, 3 cr

Introduces students to ethical issues in the care and treatment of alcohol and substance abusers. Includes the Federal Confidentiality Law for alcohol, other drugs and HIV/AIDS; the New York State Office of Alcohol and Substance Abuse Services Code of Ethics (including sexual harassment); the client-counselor relationship; mandated reporter-child abuse and neglect; counselor wellness and stress management.

Prerequisites: HEA 3502, HUS 3602

HUS 3620
Supervision in Human Services

3 cl hrs, 3 cr

This course develops the role of the supervisor within the human services organization. Application of a myriad of supervisory roles and methodologies to develop traditional and start-up human services organizations into learning and self-improvement. Focus is on applied functionality, individual creativity, facilitation within organizations and the community. Cross-cultural communications, managerial styles, leadership, strength theories and use of data for policy change are highlighted.

Prerequisites: HUS 3501, HUS 3503, HUS 3504

HUS 4700
Professional Internship I

1.5 cl hrs, 200 hrs field work per semester, 3 cr

A professionally supervised field work/internship experience in a human service agency. The internship and on-campus classroom seminar assesses and implements student progress towards professional practice. This includes application of human service skills of assessment, intake, biopsychosocial, service plans, case management, community organization/advocacy, referral, individual, group, and family counseling. The development of responsible, ethical and appropriate problem solving techniques are emphasized. A capstone project, of researching and proposing the needs of the internship agency, and executing this change in the next internship, is required.

Prerequisites: GPA of 2.0 or higher, HUS 3501, HUS 3503, HUS 3504 and one of the following: HEA 3502, HEA 3505, HEA 3508, or HEA 3510

HUS 4801
Professional Internship II

1.5 cl hrs, 200 hrs field work per semester, 4 cr

Professionally supervised work experience carried out in human services agency. Weekly seminars assess student growth, explore student concerns and professional practice issues. The development of responsible and appropriate problem-solving techniques is emphasized.

A minimum of 400 hours of field work in the area of specialization (substance abuse treatment, gerontology, child welfare and family rehabilitation services and mental health services) is required during the two-semester placement.

Students must complete all professional internship placement documentation, complete a placement interview and attend the professional internship orientation prior to enrolling in HUS 4801. Policies and procedures are stated in the Professional Internship Performance Standard Manual.

Prerequisites: GPA of 2.0 or higher, HUS 4700

HUS 4802
Volunteerism

2 cl hrs, 20 hrs community volunteer work per week, 2 cr

The role and function of volunteers in human services organizations. Students develop a training program to meet the needs of volunteers and human services agencies. The student analyzes the professional and ethical issues concerning the role of volunteers in human services organizations.

Prerequisite: HUS 2405

HUS 4803
Resource Development In Human Services

3 cl hrs, 3 cr

The process of developing resources for a human services program. Students develop a statement of need, a budget and program management evaluation procedures.

Resources for funding programs, the requirements of various funding sources and the legal requirements for resource accountability are explored.

Prerequisite: HUS 2405

HUS 4804
Management Concepts in Human Services

3 cl hrs, 3 cr

The nature of human services management, program planning and administration. Special attention is given to the concepts and practice skills of various organizational and program management models including program planning budgeting system, management by objective, cost-benefit analysis, zero-base budgeting and total quality management. Emphasis is placed on management efforts that make human services organizations and programs more efficient, effective and humane in the delivery of health and social services.

Prerequisite: HUS 2405

HUS 4810
Strategic Planning and Reformation Within the Human Services Organization

3 cl hrs, 3 cr

This course focuses on the theoretical and applied dimensions of strategic planning and organization reform with reference to policy design and program implementation within public and nonprofit organizations. Focus is on management, population diversity, needs, funding, program effectiveness, stakeholders of an organization, systematic assessment and the ever-changing social environment.

Prerequisites: HUS 3620, HUS 4804

Law and Paralegal Studies

Professor Concetta I. Mennella, Chair
Namm Hall, room N 622
718.260.5124
email: cmennella@citytech.cuny.edu

PROGRAMS:

Legal Assistant Studies/AAS
Legal Assistant Studies/BS

FACULTY:

Professor: Hunter
Associate Professors: Donsky, Mennella, Moran, Williams
Assistant Professors: Espinoza, Coughlin

Associate in Applied Science in LEGAL ASSISTANT STUDIES

The terms "paralegal" and "legal assistant" are used interchangeably. Both refer to people who assist attorneys with all forms of substantive legal work. Paralegals perform a wide variety of specialized tasks in a broad range of legal matters, all under the supervision of an attorney. Paralegals are not permitted to practice law. They may perform substantive legal work only under the supervision of a licensed attorney.

The curriculum at City Tech is designed to provide the student with the skills and knowledge of substantive and procedural law required to function in the legal environment.

The Department of Law and Paralegal Studies offers two degrees: an associate in applied science (AAS) and a bachelor of science (BS). Students may be admitted into either program. Both programs are accredited by the American Bar Association.

Both curricula offer a solid liberal arts background with a full range of legal specialty courses that give the students the technical proficiency and practical skills necessary to competently perform legal tasks. The College has an excellent in-house law library. Paralegal students also have a newly remodeled cutting-edge computer lab with legal-applicable and legal-specific software including systems for computer-assisted legal research. These resources assure that the City Tech paralegal graduate will be equipped with the legal writing, research and computer skills required to work in law-related areas.

Paralegal courses are offered days, evenings and weekends, and a select number of courses are available in the summer program. AAS students participate in one internship course and baccalaureate students may participate in an additional internship course. This gives the student the opportunity to combine classroom study with practical on-the-job experience. Transfer students should meet with the department chair prior to acceptance into the program.

Representative samples of sites where associate degree graduates are working include the U.S. Attorney General's Office, New York City Law Department, U.S. Department of Labor, New York City Board of Education, Legal Aid, JPMorgan Chase, Cullen & Dykman, Federal Trade Commission, New York City Transit Authority, New York State Workers' Compensation Board and judicial offices as well as local law firms.

Entrance and Progression Standards

Entrance into paralegal studies courses requires CUNY proficiency in reading and writing. All students admitted without such proficiencies will be required to complete necessary remediation and to obtain proficiency before progressing into paralegal studies courses. A minimum grade of "C" in each course with the prefix LAW is required for progression within the paralegal studies major. Students may repeat an LAW course once if they have received a "D" or "F" grade.

Associate in Applied Science Degree (AAS)

Program Goals: Graduates with an associate in applied science degree in Paralegal Studies should be able to:

- Describe the evolving role, responsibilities, and ethical obligations of paralegals/legal assistants in the delivery of legal services and also the development and expansion of access to legal services.
- Explain the basic principles of the American common law system with particular attention to the structures and jurisdiction of the Federal and New York court systems.
- Use appropriate legal terminology in all forms of written, oral, and visual communication.
- Locate, read, evaluate and analyze both print and electronic sources of law, and apply them to issues requiring legal analysis.
- Utilize standard legal forms on a computer data base/bank and/or appropriate software programs to draft basic legal documents related to the required courses in the associate degree.

GENERAL EDUCATION COMMON CORE

21 CREDITS

I – REQUIRED CORE¹ (4 COURSES, 12 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 3 credits)

MAT 1190	Quantitative Reasoning or other approved course	3
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Life and Physical Sciences (1 course, 3 credits)

BIO 1100	Human Biology or other approved course	3
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II – FLEXIBLE CORE (3 COURSES, 9 CREDITS)

Individual and Society

PSY 1101	Introduction to Psychology	3
COM 1330	Public Speaking	3

One additional course from any other group		3
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Writing Intensive Requirement²

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

LAW 1101	Introduction to Paralegal Studies	3
LAW 1103	Civil Law and Procedure	3
LAW 1201	Legal Research I	3
LAW 1202	Real Estate	3
LAW 2301	Estates, Trusts, and Wills	3
LAW 2303	Family Law	3
LAW 2307	Legal Research II	4
LAW 2403	Legal Document Preparation	3
LAW 2409	Legal Internship and Seminar I	4

Select one of the following:

LAW 2302	Business Organization and Commercial Law	
	or	
LAW 2405	Torts and Insurance Law	
	or	
LAW 2406	Criminal Law	3
LAW 2410	Legal Ethics and Professional Responsibility	1
ACC 1162	Elements of Accounting	3
PHIL 2101	Introduction to Philosophy	3
PSY 1101	Introduction to Psychology	Met as GenEd
COM 1330	Public Speaking or higher	Met as GenEd

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 39

TOTAL NYS LIBERAL ARTS/SCIENCE CREDITS 21

TOTAL CREDITS REQUIRED FOR THE DEGREE 60

¹ For purposes of advisement, specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category. Students are not required to make that choice but should be advised that a different choice may result in additional credits being needed for graduation.

Bachelor of Science in LEGAL ASSISTANT STUDIES

This is the first baccalaureate in paralegal studies offered at any public college in New York State. The trend in the paralegal profession is that employers are requiring higher levels of education. Larger law firms and corporate law departments in New York require applicants with a baccalaureate degree. The upper-level baccalaureate courses in paralegal studies introduce students to more specialized areas of law and increase communication and computer skills. The minimum educational requirement for law school is a baccalaureate degree; our degree meets that requirement, and provides the added advantage of familiarity with law and legal research prior to entering law school.

Graduates with a baccalaureate degree are working in higher-level jobs in government and prestigious law firms or go on to enroll in post-graduate studies such as law school, graduate school or social work.

Admission into the Baccalaureate Program

There are many ways a student can enter the bachelor of science program in Legal Assistant Studies. Students may enter the bachelor of science degree program as freshmen if they meet the general College criteria in Admissions. These students will follow the AAS curriculum for the first 60 credits and may choose to receive the AAS along the way. Students may transfer in from the City Tech AAS program in paralegal studies before or after completing the AAS degree. Students may enter from other programs, either here at City Tech or from other colleges, if they meet College criteria for transfer admission. The Law and Paralegal Studies Department will accept a maximum of 25 credits in legal specialty courses from colleges offering paralegal courses. Alternative delivery courses will be reviewed individually on a case-by-case basis. Students with questions are advised to consult the Office of Admissions.

Transcripts of entering transfer students will be evaluated to determine the courses they must complete for the bachelor of science degree.

Please consult the department for further information.

Baccalaureate Degree (BS)

Baccalaureate coursework builds upon the foundation of the AAS course work and continues to develop the skills needed for professional advancement.

Program Goals: Graduates with a Baccalaureate Degree in Paralegal Studies should be able to:

- Enhance students' understanding of their ethical and professional responsibilities as a member of the legal team working with diverse clientele and/or in diverse settings.
- Research and join a legal professional organization/association to expand their knowledge base, engage with other paralegal/legal assistant students or those working in the field, and remain current with the latest developments in their profession.
- Apply time management skills, prioritize tasks/assignments, and manage information utilizing computer databases/software programs.
- Access and evaluate legal and non-legal data available on the Internet for reliability and validity of information.
- Recognize and appreciate special and complex issues involved in advocacy and litigation in relation to both the required and elective baccalaureate level courses.

GENERAL EDUCATION COMMON CORE ¹		42 CREDITS	PROGRAM-SPECIFIC DEGREE REQUIREMENTS	
I – REQUIRED CORE ² (4 COURSES, 12 CREDITS)			Associate-Level Courses (36 credits)	
English Composition (2 courses, 6 credits)			LAW 1101	Introduction to Paralegal Studies 3
ENG 1101*	English Composition I	3	LAW 1103	Civil Law and Procedure 3
ENG 1121*	English Composition II	3	LAW 1201	Legal Research I 3
Mathematical and Quantitative Reasoning (1 course, 3 credits)			LAW 1202	Real Estate 3
MAT 1190*	Quantitative Reasoning or other approved course	3	LAW 2301	Estates, Trusts, and Wills 3
Life and Physical Sciences (1 course, 3 credits)			LAW 2303	Family Law 3
BIO 1100*	Human Biology or other approved course	3	LAW 2307	Legal Research II 4
II – FLEXIBLE CORE (6 COURSES, 18 CREDITS)			LAW 2403	Legal Document Preparation 3
In addition to the required courses listed below, select one course from each of the other four areas; no more than two courses may be selected from any discipline.		12	LAW 2409	Legal Internship and Seminar I 4
World Cultures and Global Issues			Select one of the following:	
Any Approved Course			LAW 2302	Business Organization and Commercial Law or
US Experience in its Diversity			LAW 2405	Torts and Insurance Law or
Any Approved Course			LAW 2406	Criminal Law 3
Individual and Society			LAW 2410	Legal Ethics and Professional Responsibility 1
PSY 1101*	Introduction to Psychology	3	ACC 1162	Elements of Accounting 3
Creative Expression			Baccalaureate-Level Courses (24 credits)	
Any Approved Course			LAW 3500	Legal Modules (one set of three) 3
Scientific World			LAW 4704	Legal Technology 3
Any Approved Course			Select one of the following two courses:	
One additional course from any Flexible Core area			LAW 4800	Advanced Legal Research or
PHIL 2101*	Introduction to Philosophy	3	LAW 4801	Internship and Seminar II 3
III – COLLEGE OPTION REQUIREMENT ³ (12 CREDITS)			LAW 4900	Senior Legal Seminar 3
• One course in Speech/Oral Communication ⁴		3	Select four of the following courses:	
COM 1330*	Public Speaking	3	LAW 3601	Taxation 12
• One interdisciplinary Liberal Arts and Sciences course		3	LAW 3602	Trial Preparation
• Two additional liberal arts courses or in BTech programs, additional liberal arts credits to reach a minimum total of 42 credits in general education.			LAW 3604	Employment and Labor Law
In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language.			LAW 4701	Law Office Management
Writing Intensive Requirement			LAW 4702	Bankruptcy
Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.			LAW 4703	Immigration
			LAW 4705	Administrative Law
			LAW 4802	Trademark, Copyright, Patent
			LAW 4805	Forensic Science and the Legal Process
			Other Required Courses/Electives (36 credits)	
			ENG 1101*	English Composition I Met as GenEd
			ENG 1121*	English Composition II Met as GenEd
			ENG 1161	Language and Thinking or any Literature Course 3
			ENG 2570	Writing in the Workplace 3
			ENG 3401	Law Through Literature 3
			BIO 1100*	Human Biology or
				other approved course Met as GenEd
			GOV 2401	Constitutional Law or
			SOC 2403	Law and Society 3

MAT 1272	Statistics	
	or	
MAT 1372	Statistics with Probability	3
PHIL 2101*	Introduction to Philosophy	Met as GenEd
PHIL 3211	Philosophy of Law	3
PSY 1101*	Introduction to Psychology	Met as GenEd
PSY	Any 2000 series or higher	3
COM 1330*	Public Speaking	Met as GenEd
COM 1340	Oral Interpretation of Literature	
	or	
COM 2402	Intercultural Communications	3
ELECTIVES		
HIS	Any HIS	
	or	
AFR 1461, 1465, 1466, 1467, LATS 1462		3
Free Electives: Additional credits to reach minimum of 120 total credits, including 60 credits of Liberal Arts and Sciences.		

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES	60
TOTAL NYS LIBERAL ARTS/SCIENCE CREDITS	60
TOTAL CREDITS REQUIRED FOR THE DEGREE	120

* Indicates courses required for the AAS in Legal Assistant Studies at New York City College of Technology.

1 The BS in Legal Assistant Studies is built on the AAS in Legal Assistant Studies using a 2+2 model. Requirements for transfer students from CUNY institutions will be governed by CUNY Pathways policy and existing articulation agreements. Transfers from outside of CUNY will be evaluated individually.

2 Students are strongly urged to consult degree requirements for "double-duty" courses: degree requirements that also meet CUNY Pathways general education requirements in that category.

3 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

4 Students who have already met this requirement may choose any other liberal arts and science course in its place.

COURSES:

LAW 1101 Introduction to Paralegal Studies

3 cl hrs, 3 cr

An overview of the legal system and the role of the legal assistant within that system. Includes the sources of the law; legal terminology; the operation of the court system at the state and federal level; respective roles of attorney, client and paralegal; legal ethics and the Code of Professional Responsibility, interviewing techniques and a survey of specialized areas of law.

Prerequisite: CUNY proficiency in reading and writing; Corequisite: ENG 1101

LAW 1103 Civil Law and Procedure

3 cl hrs, 3 cr

This course is the theory and application of law and procedure in civil litigation with emphasis on New York State law. It focuses on the role of the paralegal in preparing for litigation including an understanding of the court system, the steps required in the litigation process and their time lines, drafting documents, trial and post-trial topics and an introduction to the use of the computer in litigation.

Prerequisite: CUNY proficiency in reading and writing; Pre- or corequisites: LAW 1101, ENG 1101

LAW 1201 Legal Research

3 cl hrs, 3 cr

A working knowledge of the law library is presented including practice in finding statutes, cases and administrative regulations.

Students are taught validating and gain experience in using legal encyclopedias, digests and other sources. All these research skills are integrated within written assignments.

Prerequisites: LAW 1101, ENG 1101; Pre- or corequisite: LAW 1103

LAW 1202 Real Estate Law

3 cl hrs, 3 cr

The basic concepts of real property. The student will prepare real estate documents such as contract of sale, mortgage and note, deed, closing statement and lease agreement. Instruction in reading a survey and completing a title search. The course also covers real estate brokers, title insurance, landlord-tenant proceedings, foreclosures and the differences between condominiums and cooperatives. The role of the paralegal in real estate law is emphasized throughout.

Pre- or corequisite: LAW 1201

LAW 2301 Estates, Trusts and Wills

3 cl hrs, 3 cr

A basic overview of estate terminology, the jurisdiction of Surrogates Court and estate administration procedures. The fundamental law of wills, trusts and estates, as well as the preparation of the basic legal documents in each of these areas.

Prerequisite: LAW 1201

LAW 2302 Business Organizations

3 cl hrs, 3 cr

Application of the basic principles of contract law including the Uniform Commercial Code; the nature and structure of the three basic business forms: sole proprietorship, partnership and corporation. A comparison of methods of financing and formation of these business entities. Students will prepare business agreements which may include a partnership agreement, articles of incorporation, minutes, by-laws and related documents, promissory notes and sales contracts. Emphasis is also placed on an examination of creditor and debtor rights.

Prerequisite: LAW 1201

LAW 2303 Family Law

3 cl hrs, 3 cr

Prepares students to handle client interviews, conduct research and draw up the necessary documents for the practice of family law. Includes a study of the Family Court System and the New York laws relating to all areas of family law: marriage, divorce, annulment, custody, support, adoption, maintenance, name change, guardianship, paternity and juvenile matters.

Prerequisite: LAW 1201

LAW 2306 Legal Issues for Facilities Managers

3 cl hrs, 3 cr

The legal issues that affect facility management. Topics cover principles of contracts, leases, service and

employment agreements, purchase agreements, relevant federal and state laws, environmental and municipal regulations, liabilities of different legal entities, tort liability, media and group relations, debtor rights, business ethics and disability laws.

Prerequisite: ENG 1101

LAW 2307 Legal Research II

4 cl hrs, 4 cr

Builds upon a working knowledge of the law library and research techniques mastered in LAW 1201. This course applies those techniques by utilizing them in practical application. In addition, the student is introduced to the use of computerized legal research and additional instruction in the use of citations. This course focuses on analysis and evaluation of researched material, with a concentration on the writing aspect of reporting research.

Prerequisite: LAW 1201

LAW 2403 Legal Document Preparation

3 cl hrs, 3 cr

Language and format of legal documents. A review of skills acquired in LAW 1101 Introduction to Paralegal Studies, LAW 1103 Civil Law and Procedure, LAW 1201 and LAW 2307 Legal Research and Legal Research II and the utilization of these skills in preparing legal documents. Identification of legal terms, phrases and sentence structure is required. Students will prepare and complete documents such as pleadings, motions/

orders, first draft of contracts/business agreements, legal business letters/ correspondence, deposition digests and other legal documents. Team projects and role-playing are also emphasized and are implemented in some of the drafting assignments.
Prerequisite: LAW 2307

**LAW 2405
Tort and Insurance Law**

3 cl hrs, 3 cr
Basic tort law and insurance law as it relates to personal injuries. Intentional torts, negligence, strict liability, fire insurance and workers' compensation, using specific examples and cases to illustrate the relevant legal principles. The duties and obligations of parties in tort and insurance law. Interviewing and factual investigation techniques as well as the preparation or pleading and the organization of personal injury cases.
Prerequisite: LAW 1201

**LAW 2406
Criminal Law and Procedure**

3 cl hrs, 3 cr
A study of the procedural and substantive laws relating to the practice of criminal law. An understanding of how the criminal justice system operates: the roles of the various components of that system, law enforcement, prosecution, defense counsel, the courts and how the system acts upon the criminal defendant as well as victims of crime.
Pre- or corequisite: LAW 1201

**LAW 2409
Internship and Seminar I**

2 cl hrs, 160 field hrs/semester, 4 cr
Provides the qualified student with an opportunity to observe and gain practical experience in a legal setting under the supervision of an attorney. Students are placed in various law-related job sites such as law offices, corporations, judicial and administrative agencies. Students enrolled in LAW 2409 must complete 160 hours of work experience. Additionally, students must attend and participate in weekly seminars to discuss progress in the field, work-related problems and the integration of classroom instruction with practical application. Ethics and the role of the paralegal in the delivery of legal services will also be discussed. Students are instructed and assisted in the preparation of job applications, cover letters, resumes and the development of interviewing skills.
Prerequisite: Must be in final semester of study for AAS degree or have completed 24 credits of legal specialty courses or receive department approval

**LAW 2410
Legal Ethics and Professional Responsibility**

1 cl hr, 1 cr
This course prepares students to recognize and appropriately respond to the full range of ethical challenges confronting paralegals in various settings within the legal profession. Students role play in a series of vignettes focused on issues such as unauthorized practice of law, confidentiality, and competent representation.
Prerequisite: LAW 1101

LAW MODULES

All modules will require as a prerequisite an AAS degree in legal assistant studies (or the equivalent) or 27 credits of legal specialty courses. Students will take three modules in a semester. Students must take all three modules offered on the same day and time.

**LAW 3530
Alternate Dispute Resolution**

1 cl hr, 1 cr
The resolution of disputes through means other than litigation. ADR is being used more frequently as an efficient and effective way to resolve controversies.

**LAW 3531
Elder Law**

1 cl hr, 1 cr
An overview of issues affecting the elderly including Medicaid, Medicare, supplemental security income and social security and other entitlements including their eligibility requirements. The course will include health care directives, supplemental needs trusts and a review of applicable laws pertaining to the elderly including Mental Hygiene Law Article 81 Proceedings. Ethical considerations involving the elderly will be discussed throughout the course.

**LAW 3532
Securities**

1 cl hr, 1 cr
Review of terminology and fundamental concepts relating to state and federal regulation of securities offerings, markets and broker-dealers. Roles of the issuer, broker-dealer, attorney, accountant, underwriter and legal assistant in the process by which financial assets are offered for sale in the securities market. Preparation, procedure and approval of documents used in the offering of securities.

**LAW 3533
Adoptions**

1 cl hr, 1 cr
Examines the role of the paralegal in the adoption procedure for private placement and agency adoptions, investigative requirements, parental qualifications, couple and single parent adoptions, step-parent adoptions, grandparent adoptions, parental rights and the criteria for revocation of adoptions.

**LAW 3534
Investigative Techniques**

1 cl hr, 1 cr
This course introduces information-gathering techniques through investigation including use of discovery devices, conducting interviews, developing sources and use of the Internet.

**LAW 3535
Workers' Compensation**

1 cl hr, 1 cr
Students will concentrate on familiarizing themselves with the language and format of all labor, insurance and medical forms associated with filing a Workers' Compensation claim pursuant to the law governing such claims. Attention will be given to the client interview as well as preparation of various documents and pleadings needed to bring a claim to the hearing stage of proceedings.

**LAW 3536
Pension and Employee Benefits**

1 cl hr, 1 cr
A review of pension and profit sharing plans, with particular emphasis on federal requirements for qualified plans. The student will become familiar with plan and trust agreements, reporting and disclosure forms and other pertinent documents.

**LAW 3537
Environmental Law**

1 cl hr, 1 cr
An overview of current environmental law issues including air and water quality, noise controls, solid and hazardous waste, medical waste, toxic substances and environmental impact review. The emphasis is on federal and state statutory and regulatory requirements and case law interpretation. The future direction of environmental law will be discussed.

**LAW 3538
Commercial Transactions**

1 cl hr, 1 cr
An intensified study of the Uniform Commercial Code, the central law which governs business and sales transactions within the United States. The student

will become familiar with the various regulations imposed by the Code. The form and other paperwork necessary to comply with this law, and the basic contract principles that underlie the use of the Uniform Commercial Code will also be examined. In addition, other laws which pertain to commercial transactions will be discussed where appropriate.

**LAW 3539
International Law**

1 cl hr, 1 cr
The basic concepts of international law and trade are presented to enable students to assist in private practice and the courts. The rules and regulations affecting import of goods into the United States, the various forms and documentation necessary for handling Customs matters, import and export of goods, forfeiture and seizure of goods, trade practices and agreements and the judicial procedure followed in the review of matters involving international law will be covered.

**LAW 3541
Evidence**

1 cl hr, 1 cr
Provides a comprehensive study of the basic rules of admissibility and the purpose for which evidence is offered. Students become acquainted with evidentiary principles and how to gather information which is admissible at hearing or trial.

**LAW 3542
Collections**

1 cl hr, 1 cr
Familiarizes students with the procedures to be followed once a judgment has been obtained. Emphasis will be placed on enforcement of judgments and the impact of federal law on this specialty.

**LAW 3543
Sports and Entertainment**

1 cl hr, 1 cr
This course familiarizes the paralegal student with the basic aspects of sports law and entertainment law. It is a practical skills based course wherein students discuss current applicable case law and relevant legal issues surrounding this area of the law by reviewing contracts/waivers, statutes, collective bargaining agreements and the regulations of the NCAA.

**LAW 3545
Housing Law**

1 cl hr, 1 cr
This course will provide a legal and practical foundation in various aspects of housing law including rent control, rent stabilization, security of tenure, types of tenancy,

homelessness, eviction, disrepair and tenant insurance. These issues will be examined from the perspective of landlord and tenant.

LAW 3601 Taxation for Legal Assistants

3 cl hrs, 3 cr

Examination of selected provisions of the Internal Revenue Code and administrative procedures as they relate to income taxation of individuals, corporations and estate tax returns. Methods used in preparing these returns. Explanation of types of incomes and deductions, capital gains and losses. Instruction on how to interview clients to get necessary information, maintain records and draft returns for the following taxes: corporate income; individual income; partnership income; estate, gift and trust. How to gather information for audits and review. This is not a tax preparer's course.

Prerequisite: AAS degree with major in Legal Assistant Studies or completion of 27 credits in legal specialty courses (or the equivalent)

LAW 3602 Trial Preparation

3 cl hrs, 3 cr

Role of the paralegal in gathering evidence to be used in evaluating and negotiating settlements and preparing for trial. Use of computers, investigative work and file preparation in litigation.

Prerequisites: AAS degree in legal assistant studies, or LAW 2403 and completion of 27 credit in legal specialty courses

LAW 3604 Employment and Labor Law

3 cl hrs, 3 cr

Substantive and procedural law and agency rules governing the broad area of labor-management relations in the private and public sectors. How private businesses and government employers deal with unions, unions' relationship with other unions, and the worker's relationship with his/her union and employer. Fair employment practices.

Prerequisite: AAS degree in legal assistant studies (or the equivalent) or completion of 27 credits in legal specialty course

LAW 4701 Law Office Management

3 cl hrs, 3 cr

Functions and responsibilities of a legal administrator. Basic management principles and theories applied to the solution of problems and attainment of goals in the law office. Office structure, staffing, employer/employee relations,

time-keeping, office equipment, professional responsibility, job analysis and evaluation, fundamentals of motivation and problem-solving techniques and aspects of financial planning for the office.

Prerequisite: AAS degree in legal assistant studies or completion of 27 credits in legal specialty courses

LAW 4702 Bankruptcy

3 cl hrs, 3 cr

Introduces the paralegal student to the basic concepts involved in bankruptcy law and the practical aspects of representing debtors and creditors within the bankruptcy system. Selected sections of the Bankruptcy Code and Bankruptcy Rules of Procedure are covered. Students learn to prepare the forms, documents and schedules most commonly used in bankruptcy proceedings.

Prerequisite: AAS degree in legal assistant studies or completion of 27 credits in legal specialty courses

LAW 4703 Immigration

3 cl hrs, 3 cr

This course introduces the paralegal student to the laws affecting immigration and the specialized technical vocabulary used in this area, and enables him/her to become familiar with the other administrative agencies that work with immigration such as the U.S. State Department, Homeland Security and Labor Departments. Students will learn to prepare the forms, documents and schedules most commonly used in immigration proceedings. They will be exposed to the use of electronic filing and processing of immigration forms and documents. Emphasis will be placed on developing the communication and investigative skills necessary to obtain correct information from the client in preparing applications.

Prerequisite: AAS degree in legal assistant studies or completion of 27 credits in legal specialty courses

LAW 4704 Legal Technology

3 cl hrs, 3 cr

This course continues instruction in previously introduced software at an advanced level and the relation of the law as it applies to the use of technology current in the law office. The importance, portability and utilization of this knowledge as it impacts and advances the legal professions is given special emphasis. *Prerequisites:* Associate degree in legal assistant studies or LAW 2403 and an additional 27 legal specialty course credits

LAW 4705 Administrative Law

3 cl hrs, 3 cr

The development of government functions, power and procedures which form the basis of administrative law; and the role of the legal assistant in the grievance procedure and hearings. The student will research administrative law decisions, discuss the role of government agencies in the social welfare system, describe the development and role of hearing officers and administrative law judges, and describe judicial review as the court of last resort.

Prerequisite: AAS degree in legal assistant studies or completion of 27 credits in legal specialty courses

LAW 4800 Advanced Legal Research

3 cl hrs, 3 cr

A series of research, writing and oral assignments of increasing complexity on various topics of substantive law. Will cover legal analysis, preparation of outlines and rough drafts of legal documents, e.g., appellate briefs, trial briefs and memorandums of law; correct usage of citation form, and utilization of proper legal research techniques. Particular emphasis is placed on oral and written presentation.

Pre- or corequisites: Completion of 90 required credits and ENG (ENG 1161 or any LIT course), LAW 4704

LAW 4801 Internship and Seminar II

1.5 hr wkly seminar, 125 hrs internship work experience, 3 cr

The student in the last year of the program is provided with practical experience in a legal setting. Students are placed in law-related jobs in law offices, corporations, judiciary, administrative agencies, etc. The student works 125 hours under the supervision of an instructor from the College and a lawyer and/or paralegal at the internship site. The student will participate in a weekly seminar with the other interns in the program. In addition to giving the intern an opportunity to utilize paralegal knowledge and skills, this program helps the student to clarify career goals. *Prerequisite:* Completion of 90 credits

LAW 4802 Trademarks, Copyrights and Patents

3 cl hrs, 3 cr

An overview of the substantive and procedural law of patents, copyrights and trademarks and the role of the paralegal in this specialized area. How to assist the inventor in applying for a patent with the U.S. Patent and Trademark Office; how to conduct a patent search and acquire

the knowledge of application and registration procedures in this area. Practice and procedure before the U.S. Patent and Trademark Office and the U.S. Copyright Office.

Prerequisite: AAS degree in legal assistant studies (or the equivalent), or completion of 27 credits legal specialty courses

LAW 4805 Forensic Science and the Legal Process

3 cl hrs, 3 cr

Forensic science is the application of science to the law and encompasses various scientific disciplines. This course will provide the student with detailed knowledge of subjects underpinning forensic science in the broad areas of biology, chemistry and investigation. It will explore ways in which a forensic case is investigated at both the scene of the crime and in the laboratory. It will also look at the techniques used by forensic biologists and chemists and will use many examples of criminal cases where forensic evidence was of particular importance. Tentative topics would include but not be restricted to: Crime Scene Analysis, Significance and Properties of Physical Evidence, Toxicology, Arson and Explosion Investigation, Forensic Serology, DNA Evidence, Fingerprinting, Document and Voice Evidence, Forensic Science and Internet Investigation. When possible, forensic professionals will participate in the classroom to enrich discussion. The format of the course is mainly lectures.

Prerequisite: AAS completed or department approval in advance and BIO 1101

LAW 4900 Senior Legal Seminar

3 cl hrs, 3 cr

Available to students in the last semester of their baccalaureate coursework. It requires students to utilize all of the substantive legal knowledge and practical legal research skills they have acquired to produce a significant, scholarly paper on a legal topic. Students will receive an intense review of legal research techniques and legal ethics which will be of help to them before their entry into the legal job market. In addition, lectures, discussions and guest speakers will concentrate on a different substantive area of law each semester.

Prerequisite: LAW 4800 or LAW 4801

Nursing

Professor Margaret Rafferty, Chair
Pearl Building, room P 505
718.260.5660
email: mrafferty@citytech.cuny.edu

PROGRAMS:

Nursing/AAS
Nursing/BS

FACULTY:

Associate Professors: Dato, Egues, Okumakpeyi, Rafferty
Assistant Professors: Bradley, Curran, Dorsainvil, Falk, Gellar,
Kontzamanis, Leinung, Maley, Palmer, Paradiso, Phaire-Morton,
Santisteban, Waddy
Senior CLT: Li

Accreditation

The associate in applied science and the bachelor of science programs are accredited by the Accreditation Commission for Education in Nursing and registered with the New York State Education Department.

Accreditation Commission for Education in Nursing (ACEN),
3343 Peachtree Road NE, Suite 850
Atlanta, Georgia 30326
telephone: 404.975.5000 fax: 404.975.5020.
New York State Education Department
The University of the State of New York
Professional Education Program Review
89 Washington Avenue, 2nd Floor, West Wing
Albany, NY 12234
Telephone: 518.486.2967 Fax: 518.473.0114
email: opprogs@mail.NYSED.GOV

CUNY Residency Policy for Admission into Nursing Programs

All CUNY nursing departments will require applicants for admission into nursing clinicals to provide documentation in one of the following categories:

1. U.S. Citizenship;
2. Permanent Residency;
3. International Student with F1 Status;
4. Granted Asylum, Refugee Status, Temporary Protected Status, Withholding of Removal, Deferred Enforced Departure or Deferred Action Status by the U.S. government.

Students who are unsure of their status, or for assistance, contact the CUNY Citizenship Immigration Project office at City Tech, the Namm Building, room N 621A.

Americans with Disabilities Act

If you have a physical, psychological, medical or learning disability that may impact on your ability to carry out assigned course work, contact the staff in the Center for Student Accessibility, Atrium Building, room A 237, 718.260.5143. SSS will review your concerns and determine with you what accommodations are necessary and appropriate. All information and documentation of disability are confidential.

Associate in Applied Science in NURSING

The Nursing program prepares students to become members of the health team in health service agencies, clinics, community and long-term care agencies and hospitals. In addition to academic coursework in the classroom, skills are practiced in the College laboratory and health care facilities. Adjunct faculty who hold outside employment in a variety of clinical and educational settings teach approximately 60% of the clinical sections of the nursing courses. National Council Licensing Exam (NCLEX-RN) pass rates for City Tech nursing graduates exceed the mean for all similar programs in New York State.

The Nursing program at New York City College of Technology bases its curriculum on Watson's philosophy and theory of human caring in nursing. Students learn to care for clients by providing a supportive, protective and/or corrective environment, with attention to the client's physical, emotional, socio-cultural and spiritual condition. Clients are assisted at each level of human development to move toward the fullest realization of health potential through gratification of human needs. Gerontological nursing and community-based nursing are integrated throughout the curriculum. Technology is infused into the curriculum through clinical laboratory simulation and BlackBoard enhancement of all NUR courses. Graduates are thus particularly well prepared for the rapidly expanding areas of nursing need and the most recent graduate survey results indicate that all respondents are employed in a variety of health care settings reflective of the curriculum.

Program Outcomes

- Incorporate knowledge and skills gained from the communication arts, information technology and the social and biological sciences into nursing practice.
- Utilize the caring model to safely meet the health needs of clients of all ages in a variety of settings.
- Apply the nursing process as a creative problem solving approach in the delivery of client-centered care to culturally diverse clients.
- Incorporate evidence-based practice using critical thinking in decision-making situations when caring for clients.
- Incorporate effective communication in interactions with clients, families, significant others and health care providers.
- Implement client/family health teaching along the health-illness healing continuum.
- Collaborate with clients, families, significant others and health care providers in creating a protective, supportive and/or corrective environment for clients.
- Incorporate legal and ethical principles into safe nursing practice.
- Demonstrate accountability by utilizing quality improvement concepts in the management of care.
- Function as a client advocate in the health care system.
- Continue life-long learning activities and professional development.
- Maintain involvement in community-based service.

REGISTERED NURSE LICENSURE

A license to practice as a registered professional nurse in New York State is granted to graduates of nursing programs approved by the State Education Department who are at least eighteen years old, are of good moral character*, and have passed the licensing examination of the State Board of Nursing. Graduates are eligible to take the licensing examination at any time following graduation.

* FROM THE NURSING HANDBOOK, PART 28, DETERMINATION OF GOOD MORAL CHARACTER IN THE PROFESSIONS

Section 28. 1 Determination of Good Moral Character.

The determination of whether an applicant for authorization to practice a profession, under title VIII of the Education Law, is of good moral character shall be made in accordance with the procedures specified in this part.

Section 28. 2 Information

All information indicating that an applicant has been convicted of a crime, or has committed an act of which raises a reasonable question as to the applicant's moral character shall be referred to the executive director of the Office of Professional Discipline or his or her designee.

The University of the State of New York

The State Education Department, Division of Professional Licensing Services
89 Washington Avenue Albany, New York 12234 c 1992 p. 44

Admission Criteria into the Introductory Courses of the Nursing Curriculum

- A high school diploma or its equivalent (GED);
- CUNY proficiency in mathematics, writing and reading;
- Prerequisites for BIO 2311: BIO 1101 and BIO 1101L with a minimum grade of C, a college-level general biology course with lab, or a score of 85 or above on the biology Regents exam (with lab).

NOTE: As of Fall 2010, students seeking a nursing degree at City Tech will be admitted into the College as an Undeclared Health major (UDH). After completing the pre-requisite courses for nursing admission Undeclared Health (UDH) students can apply for the Nursing Program.

Undeclared Health (UDH) students who have not been admitted into the nursing program by the completion of the 30th credit will be required to select another major. If you receive financial aid and do not change your major by the 30th credit, there may be a disruption in your financial aid award. For more detailed information regarding eligibility for state aid please refer to the Financial Aid section under New York State Financial Aid programs.

Introductory Term Requirements

Prior to clinical nursing coursework, all students must complete the 13-14-credit introductory sequence, with a minimum cumulative index (grade point average) of 2.5 in the following courses:

BIO 2311	Human Anatomy and Physiology I (must be within the last 5 years)	4 credits
PSY 1101	Introduction to Psychology	3 credits
ENG 1101	English Composition I	3 credits
MAT 1190	Quantitative Reasoning	3 credits
MAT 1275 or higher	College Algebra and Trigonometry	4 credits

Students may repeat only one of the introductory courses in order to meet the 2.5 grade point average in the 14-credit introductory course sequence needed for admission to the first semester nursing courses. When an introductory course grade is a "D" or "F", the student must repeat the course and the grade on the second attempt will be counted for the introductory sequence. A student may not repeat a course in which the initial grade was a "C" or better. When a student has received a "C" or better on more than one introductory course, the student may replace only one of the introductory course grades with the grade of the next level course to raise their GPA (ex. ENG 1121 for ENG 1101; BIO 2312 for BIO 2311; PSY 2301 for PSY 1101; or MAT 1272 for MAT 1275). Students with a higher level of mathematics (MAT 1375 or higher) will have their grade weighted.

Students must have an overall grade point average of 2.5 to be admitted to the first semester nursing courses. A student must have a minimum grade of "C" in each of the introductory courses with a minimum 2.5 grade point average in the 14-credit introductory course sequence.

While the standard in the introductory sequence is the minimum standard for consideration of advancement to the clinical phase of the

program, it does not guarantee progression into the clinical phase. The stronger the group of applicants in any given semester, the higher will be the index needed in the introductory sequence for consideration of advancement to the clinical phase of the program. Because of capacity limitations, students who have completed the introductory phase with the minimum 2.5 index or higher will be numerically ranked each semester and seats will be allocated on the basis of the highest cumulative average in the introductory sequence, as space permits. Due to the high number of applicants to the clinical phase of the nursing program in the past two years, the average GPA, for acceptance to the nursing program has been approximately 3.0 or higher.

All introductory students are required to take the ATI TEAS Examination or the equivalent during the introductory semester, to be used as an additional criterion for admission. Minimum score(s) as determined by the Nursing Department will be required for admission. Students must have completed the TEAS exam within (1) one year of their application to the clinical phase of the Nursing program. Students can repeat the TEAS exam one time. They must submit written applications that include the Nursing Admissions Examination results directly to the Department of Nursing.

One month prior to the first clinical laboratory experience, at a date specified by the program, students must present proof of CPR certification and a physical examination utilizing the Nursing Department form, which must be updated annually to meet health care facility and Nursing Department requirements. Current laws generally permit a state licensing board or agency to deny a license to practice nursing if the applicant has been convicted of a felony or other specified crime. Like many state licensing boards, the Office of the Profession of the New York State Education Department requires that a criminal background be reported and investigated prior to granting a license to practice nursing.

City Tech does not require a criminal background check for admittance, but the school's education requirements include placement at one or more hospitals or other off campus clinical training sites, and these sites frequently require a student to pass a criminal background check before the student can be placed for clinical training. Therefore, all clinical students will be required to have a criminal background check completed prior to the start of the initial clinical practice experience. The cost for this clinical requirements is the student's responsibility.

A student may also have to complete more than one criminal background check during the course of the Nursing program at New York City College of Technology, depending on the number of sites where he or she is placed and the requirements of each site.

If the student receives a negative incident finding from a criminal background check result, the student must resolve that issue before the start of the clinical practice experience. This may require that the student withdraw and not be permitted to register for the course for the semester until the issue is satisfactorily resolved. There are NO alternative clinical placements.

Please note that if a student is not permitted to take part in a clinical practice experience required by the program based on the results of a criminal background check, the student may be unable to complete the degree requirements. It is important for a student to consider this before enrolling in the Nursing Program. New York City College of Technology has no obligation to refund your tuition or fees or to otherwise accommodate you in the event you are ineligible to complete your course requirements based on the results of a criminal background check, or if you are denied a license to practice nursing.

Progression in Nursing

Once the student is admitted to NUR courses, the following policies will be in effect:

A minimum grade of "C" in each course designated with the prefix **NUR** (NUR 1010, NUR 1030, NUR 1110, NUR 1130, NUR 2110, NUR 2130, NUR 2210, NUR 2230) and **BIO** (BIO 2312, BIO 3302) is required.

Requirements for Passing Each Nursing Course

- A grade of satisfactory "S" in the clinical component.
- Completion of the Kaplan Integrated Testing Program or the equivalent.
- Six hours of community service per semester.

Prior to the first clinical experience each semester, students must demonstrate competency in Med-Math to be certified as safe to administer medications in the clinical area.

The student may repeat only two nursing courses with a clinical component (NUR 1030, NUR 1110, NUR 1130, NUR 2110, NUR 2130, NUR 2210, NUR 2230). A committee of nursing faculty will review requests for waiver of this policy. For students repeating NUR 1030, only 10% of allocated seats will be given to repeaters. Priority selection will be based on course numerical grade achieved in NUR 1030. Students who withdraw from first semester will need to reapply to the program. Their applications will be re-ranked within the new pool of applicants.

All NUR courses must be passed on the second registration.

On the second registration attempt for a clinical nursing course, the student will be considered for registration based on space availability. Priority selection will be based on course numerical grade achieved in the course being repeated.

NUR 2210 and NUR 2230 students are required to participate in the NCLEX-RN Advisement program which includes the Kaplan NCLEX Prep Program.

Students are expected to adhere to policies as outlined in the NYCCT catalog, the NYCCT Student Handbook and the Department of Nursing Student Handbook.

Grading Policy for all Courses Designated with the Prefix NUR

Definition	Grade	Points (Index)
93-100%	A	4.0
90-92.9%	A-	3.7
87-89.9%	B+	3.3
83-86.9%	B	3.0
80-82.9%	B-	2.7
77-79.9%	C+	2.3
75-76.9%	C	2.0
60-74.9%	D	1.0
Below 60	F	0.0

A grade of "C" is the minimum passing grade for nursing (NUR) courses. Students must repeat any nursing courses in which they receive a "D" or "F" in the theory component and/or an unsatisfactory grade in the clinical component (subject to the limits on repetition of NUR courses listed above).

Transfer into the Nursing Curriculum

Students who wish to transfer into the nursing curriculum from other college curricula must have completed the criteria for placement in the nursing curriculum and introductory term. To be eligible for admission into the nursing program, transfer students from other colleges must be in good academic standing, not on academic probation, not academically or administratively dismissed and not barred from continuing enrollment in the nursing program at previous college(s). Transfer students from other colleges must be registered at New York City College of Technology for at least one semester prior to being ranked for entry into the

clinical nursing courses. They must meet the criteria for admission into the nursing curriculum and introductory semester, and must achieve a 2.5 or higher cumulative index in the introductory course sequence to be considered for progression into the clinical program. Students will be numerically ranked for advancement into the clinical phase of the program as space permits. Any introductory course completed at another college must have a letter grade for computation of index. To receive transfer credit for the required sciences, students must have completed Anatomy and Physiology I and II, and Microbiology within five (5) years of their acceptance to the clinical phase of the nursing program.

Readmission to Nursing

Students who have not registered for nursing courses for two consecutive semesters will be readmitted to nursing on a space-available basis and the achievement of a minimum grade of 75% on a comprehensive nursing examination of previously completed nursing coursework.

Graduation from the Nursing Program

A minimum cumulative grade point average of 2.0 in the required 67 credits is necessary for graduation from the nursing program. The clinical nursing courses must be completed within five (5) years.

Approximate Additional Costs

Annual physical examination and NYS immunization requirements and clearance fee*	Dependent on coverage
Hepatitis B Vaccine is recommended	Provided at no cost by CUNY
CPR Certification with AED	\$90
Uniform with emblem, scrubs, shoes, scissors, watch, stethoscope	\$250
Nursing Textbooks	\$1100
PDA with e-books	\$475
Licensure Fee (NCLEX-RN)	\$343
Standardized Exams	\$500
Drug Screening	\$32
Background Check	\$105
Medical Document Tracker	\$30

* The College's Student Health Services Center (SHSC) may be able to provide the physical examination based upon availability of appointments. (General Building, room 414, 718.260.5910)

GENERAL EDUCATION COMMON CORE ¹

23/24 CREDITS

I – REQUIRED CORE ² (4 COURSES, 13-14 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 3-4 credits)

Select one of the following courses		
MAT 1190	Quantitative Reasoning	3
MAT 1275	College Algebra and Trigonometry or higher ³	4

Life and Physical Sciences (1 course, 3 credits)

BIO 2311	Human Anatomy and Physiology ⁴	4
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II – FLEXIBLE CORE (3 COURSES, 10 CREDITS)

Individual and Society

PSY 1101	Introduction to Psychology	3
PSY 2301	Child Psychology	3

Scientific World

BIO 2312	Human Anatomy and Physiology II	4
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Writing Intensive Requirement⁵

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS (43 CREDITS)

NUR 1010	Medication Calculations in Nursing	1
NUR 1030	Foundations of Caring	6
NUR 1110	Caring for Clients with Common Alterations in Functional Needs	5
NUR 1130	Caring for Clients with Common Alterations in Survival Needs	5
NUR 2110	Caring for Clients with Complex Alterations in Survival and Functional Needs	5
NUR 2130	Caring for Clients with Alterations in Integrative Needs	4
NUR 2210	Caring for Clients with Chronic Alterations in Human Needs	5
NUR 2230	Caring for Clients and Families with Growth Seeking Needs	5
BIO 2311	Human Anatomy and Physiology I	Met as GenEd
BIO 2312	Human Anatomy and Physiology II	Met as GenEd
BIO 3302	Microbiology	4
MAT 1190	Quantitative Reasoning	
MAT 1275 or higher	College Algebra and Trigonometry	Met as GenEd
PSY 1101	Introduction to Psychology	Met as GenEd
PSY 2301	Child Psychology	Met as GenEd
SOC 1101	Elements of Sociology	3

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 43

TOTAL GENERAL EDUCATION CREDITS 23-24

TOTAL CREDITS REQUIRED FOR THE DEGREE 66-67

¹ Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.

² Specific courses listed are degree requirements that also meet CUNY Pathways general education requirements in that category.

³ Students who elect to take MAT 1275 without the requisite math background will be required to take MAT 1175 in preparation, depending upon initial placement. This will increase the number of required credits for the degree by 4.

⁴ Students without requisite science background for BIO 2311 will be required to take BIO 1101 in preparation. This will increase the number of credits required for the degree by 4.

⁵ A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

Bachelor of Science in NURSING

This bachelor of science (BS) in Nursing degree program provides associate degree and diploma-prepared registered professional nurses with the education and skills necessary to become leaders and managers in a variety of health care settings. Baccalaureate prepared nurses are integral collaborative members of diverse interdisciplinary health care teams.

The baccalaureate in nursing curriculum prepares nurses as generalists with experiences across the life span. This flexible upper-level program provides didactic and clinical courses to meet the needs of RN students. In addition to academic coursework in the classroom, students practice physical assessment skills in a college laboratory setting. Select clinical agencies afford students dynamic learning opportunities to expand their knowledge base in leadership, community health and urban health issues.

Nurses entering the program with an associate degree in nursing from a credit-granting institution may have up to 60 credits of course work that was required for the AAS degree transferred toward the 120-credit BS degree (additional credits will be evaluated). Nurses seeking entrance to the program with a diploma or from an institution where college credit has not been granted will be required to take the Nursing Acceleration Challenge Exams (NACE) II RN to BS (NLN ACE II Examinations) for acceptance of previous nursing courses.

The rapid expansion of information technology and the computer resources at New York City College of Technology facilitate the faculty's ability to offer the curriculum with classes on campus, and partially on-line. Upon completion of the program, nurses will have the foundation for both graduate studies and baccalaureate-level nursing practice.

Program Outcomes

- Apply analytical reasoning and critical thinking skills in the incorporation of knowledge synthesized from nursing, humanities and the biological and social science into professional nursing practice.
- Utilize information technology to include traditional and developing methods of discovering, retrieving and using information in nursing practice.
- Effectively communicate with culturally diverse persons and disciplines in a caring manner, using a variety of strategies.
- Utilize the nursing process to provide culturally competent care to persons across the lifespan.
- Collaborate with significant support people and members of the health care team to assist diverse persons to achieve identified goals.
- Assume a leadership role within the scope of professional nursing practice.
- Participate in research that focuses on evidence-based practice and utilize findings to support clinical decision-making.
- Incorporate professional nursing standards and accountability into practice.
- Demonstrate a commitment to lifelong learning and personal and professional development through continuing education and participation in professional organizations.
- Recognize the impact of economic, political, social and demographic forces affecting the delivery of regional, national and global health care.

Admission Criteria

To qualify for admission, applicants must meet the following criteria:

- Associate degree in nursing from the City University of New York or from a non-CUNY regional or nationally accredited credit-granting institution with an overall GPA of 2.5 or higher on a 4.0 scale.
- Current licensure in New York State as a Registered Professional Nurse, or eligibility to sit for the National Council Licensure Examination - RN

(NCLEX-RN) - in New York State. Students who do not currently hold an RN license may apply to the program in anticipation of licensure. Unlicensed students who meet the eligibility criteria will be admitted on a case by case basis and will be required to obtain their RN license prior to registration in a nursing course with a clinical component.

- Nurses who hold a nursing diploma from a non-credit granting institution may also apply. Diploma applicants are required to pass the National League for Nursing's Acceleration Challenge Exams (NLN NACE I and II RN to BSN) for acceptance of previous nursing credits. Student scores on this exam are equated to the required 2.5 GPA from students entering with an associate degree in nursing.
- Successful completion of all pre-major requirements in the nursing program, either by examination or by completion of the appropriate courses.
- All University policies regarding skills and proficiency testing, grading, transfer credit, and degree completion will apply.

Progression in Nursing

- A 2.5 cumulative grade point average must be maintained.
- Students must achieve a minimum grade of "C" in all nursing courses (NUR) and required courses in the curriculum.
- A student may repeat only one of the required nursing courses.
- Courses designated NUR must be passed on the second registration.
- A grade of satisfactory "S" in the clinical component of nursing courses (NUR 3010, NUR 3110, NUR 4010, NUR 4110) is required for passing the course.
- Only one withdrawal (W) for academic reasons from a required nursing course is permitted.
- Students required to take NLN ACE II Examinations for previous nursing credit must complete all tests with a satisfactory grade prior to enrolling in fourth semester curriculum nursing courses (NUR 4110, NUR 4130).

Required Documentation

Students enrolled in a course with a clinical component (NUR 3110, NUR 4010, NUR 4110) must submit the following documents prior to the first clinical laboratory experience at the date specified by the program. All documents must continue to be current to remain in the course:

- CPR Certification with AED.
- Annual physical exam, required NYS immunizations, flu shot, and other clearances to meet health care facility and Nursing Department requirements.
- A current license in New York State as a Registered Professional Nurse.
- Some contractual agreements require that students submit a drug screen and criminal background check performed by an approved nursing department vendor

Current laws generally permit a state licensing board or agency to deny a license to practice nursing if the applicant has been convicted of a felony or other specified crime. Like many state licensing boards, the Office of the Profession of the New York State Education Department requires that a criminal background be reported and investigated prior to granting a license to practice nursing.

City Tech does not require a criminal background check for admittance, but the school's education requirements include placement at one or more hospitals or other off campus clinical training sites, and these sites frequently require a student to pass a criminal background check before the student can be placed for clinical training. Therefore, all clinical students will be required to have a criminal background check completed prior to the start of the initial clinical practice experience. The cost for this clinical requirements is the student's responsibility.

A student may also have to complete more than one criminal background check during the course of the Nursing program at New York City College of Technology, depending on the number of sites where he or she is placed and the requirements of each site.

If the student receives a negative incident finding from a criminal background check result, the student must resolve that issue before the start of the clinical practice experience. This may require that the student withdraw and not be permitted to register for the course for the semester until the issue is satisfactorily resolved. There are NO alternative clinical placements.

Please note that if a student is not permitted to take part in a clinical practice experience required by the program based on the results of a criminal background check, the student may be unable to complete the degree requirements. It is important for a student to consider this before enrolling in the Nursing Program. New York City College of Technology has no obligation to refund your tuition or fees or to otherwise accommodate you in the event you are ineligible to complete your course requirements based on the results of a criminal background check, or if you are denied a license to practice nursing.

Transfer into the Nursing Curriculum

- Transfer students are required to follow College policies.
- The request to transfer non-CUNY nursing credits will be evaluated on an individual basis by a Nursing Department faculty advisor and an official decision will be made by the Registrar.

CUNY Articulation Policy

Currently formal CUNY AAS articulation agreements are in effect with Kingsborough Community College, LaGuardia Community College, Borough of Manhattan Community College and Queensborough Community College.

Add/Drop Courses

A student dropping corequisites of a nursing course will also be required to drop the applicable nursing course.

Readmission to Nursing

The names of candidates who seek readmission to the BS program in nursing will be submitted to the Nursing Department by the Office of the Registrar. An Ad Hoc Baccalaureate program Readmission Committee will conduct a review of the candidate's academic record and submit a decision to the Office of the Registrar.

Students applying for re-admission to the program will be admitted based on decision of the Readmission Committee and on space availability.

Transportation, Uniforms and Equipment

All students must provide their own transportation for laboratories, field trips and community health assignments. They must also provide their own uniforms, if required, and equipment for clinical assignments. Professional attire and roles will be specified for each clinical course by the clinical professor in collaboration with agency liaison personnel.

Approximate Additional Costs

Drug Screening	\$32
Background Check	\$105
Medical Document Tracker.....	\$30

Graduation from the BS Degree Nursing Program

- A minimum 2.5 cumulative grade point average in the required 120 credits is necessary for graduation from the nursing program.

Suggested Time for Completion

Full-time students can complete the degree requirements in two years.

GENERAL EDUCATION COMMON CORE		45-46 CREDITS
I – REQUIRED CORE¹ (4 COURSES, 13-14 CREDITS)		
English Composition (2 courses, 6 credits)		
ENG 1101	English Composition I*	3
ENG 1121	English Composition II*	3
Mathematical and Quantitative Reasoning (1 course, 3-4 credits)		
Select one of the following courses		
MAT 1190	Quantitative Reasoning*	3
or		
MAT 1275	College Algebra and Trigonometry or higher ^{2, *}	4
Life and Physical Sciences (1 course, 3 credits)		
BIO 2311	Human Anatomy and Physiology ^{3*}	4
II – FLEXIBLE CORE (6 COURSES, 20 CREDITS)		
Select an approved course from each of the following three areas of the Flexible Core		9
World Cultures and Global Issues		
Any approved course		
US Experience in its Diversity		
Any approved course		
Creative Expression		
Any approved course		
Individual and Society		
PSY 1101	Introduction to Psychology*	3
Scientific World		
BIO 2312	Human Anatomy and Physiology II*	4
One additional course from any group		
BIO 3302	Microbiology*	4
III – COLLEGE OPTION REQUIREMENT⁴ (12 CREDITS)		
• One course in Speech/Oral Communication		
COM 1330	Public Speaking	3
• One interdisciplinary Liberal Arts and Sciences course		
Any approved course		
• Additional liberal arts credits to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language.		
PSY 2301	Child Psychology*	3
SOC 1101	Elements of Sociology*	3
Writing Intensive Requirement		
Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.		
PROGRAM-SPECIFIC DEGREE REQUIREMENTS		66 CREDITS
AssociateDegree in Nursing or Equivalent		
Baccalaureate-Level Courses (30 credits)		
NUR 3010	Physical Assessment	3
NUR 3110	Leadership in the Management of Client Care	5

NUR 3130	Nursing Research	3
NUR 4010	Community Health Nursing	5
NUR 4030	Nursing Case Management: Process and Role	3
NUR 4110	Comprehensive Client Care for Urban Health Issues	5
NUR 4130	Professional Nursing Practice	3
NUR	Nursing Elective (Choose from list)	3
BIO 2311	Human Anatomy and Physiology I*	Met as GenEd
BIO 2312	Human Anatomy and Physiology II*	Met as GenEd
BIO 3302	Microbiology*	Met as GenEd
ENG 1101	English Composition I*	Met as GenEd
ENG 1121	English Composition II*	Met as GenEd
MAT 1190	Quantitative Reasoning*	
or		
MAT 1275	College Algebra and Trigonometry or higher*	Met as GenEd
PSY 1101	Introduction to Psychology*	Met as GenEd
PSY 2301	Child Psychology*	Met as GenEd
SOC 1101	Elements of Sociology*	Met as GenEd
Additional GenEd credits must include surplus GenEd credits above the 42 permitted for Pathways and any unmet program-specific GenEd requirements:		14-15 credits
BIO 3524	Nutrition	2
BIO 3526	Pathophysiology	3
MAT 1272	Statistics	3
PSY 2404	Personnel and Organizational Psychology	3
Additional elective credits to reach a minimum of 60 GenEd credits.		3-4
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES		66
TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS		60-61
TOTAL CREDITS REQUIRED FOR THE DEGREE		126-127
<i>*Courses required for associate degree</i>		
1 For purposes of advisement, specific courses listed are "double-duty" courses: degree requirements that also meet CUNY Pathways general education requirements in that category. Students are not required to take these courses to meet their GenEd requirements; however, making a different choice may result in additional credits needed to complete the degree.		
2 Students who elect to take MAT 1275 without the requisite math background will be required to take MAT 1175 in preparation, depending upon initial placement. This will increase the number of required credits for the degree by 4.		
3 Students without requisite science background for BIO 2311 will be required to take BIO 1101 in preparation. This will increase the number of credits required for the degree by 4.		
4 Complete lists of liberal arts and sciences courses and advanced liberal arts courses, as well as semester-specific lists of interdisciplinary courses and writing intensive courses, are available online at the City Tech Pathways website .		
Students who enrolled prior to Summer 2013 and have not opted in to Pathways have different general education requirements. For those students, the following courses are appropriate choices for these categories:		
SPE 1330/1335: COM 1330 or higher		
Science Electives: Chem 1110 or higher or any Physics or Bioinformatics course		
Philosophy Electives: Any course that fulfills the Philosophy core in the Fall 12-Spring 13 NYCCT catalog		
Sociology Electives: Any SOC, PSY, ANTH, ECON, GOV, HIS course or any course in the range from AFR 1401 to AFR 1502		
Humanities Electives: Any course that fulfills the AES Core in NYCCT Fall 12-Spring 13 catalog		
Literature Electives: Any course that fulfills the Literature Core in the Fall 12-Spring 13 NYCCT Catalog		

COURSES:

NUR 1010 Medication Calculations in Nursing

1 cl hr, 1 cr

This course introduces the student to measurement systems and dosage problems for selected routes of drug administration. Emphasizes the application of basic mathematical operations needed for solving dosage calculation problems.

Prerequisites: BIO 2311, PSY 1101, ENG 1101 and MAT 1275 or higher; *Corequisites:* BIO 2312, PSY 2301, NUR 1030

NUR 1030 Foundations of Caring

4 cl hrs, 6 lab hrs, 6 cr

Using the framework of Watson's caring model, this course introduces the student to nursing practice. Emphasis is on learning how the nursing process can be used to meet the client's human needs, primarily survival and functional needs. Students learn consideration of the client's social, cultural and spiritual values within the health-illness-healing experience. In the laboratory, students develop the technical skills needed for client care in community, long-term and acute settings.

Prerequisites: BIO 2311, PSY 1101, ENG 1101 and MAT 1275 or higher; *Corequisites:* BIO 2312, PSY 2301, NUR 1010

NUR 1110 Caring for Clients with Common Alterations in Functional Needs

3 cl hrs, 6 lab hrs, 5 cr

This course builds on the knowledge and skills attained by the students in the previous nursing course Foundations of Caring (NUR 1030). Using Watson's caring model, the student learns to apply the nursing process in acute care settings to meet the needs of clients experiencing common alterations in human functional needs. Theory includes conditions that interfere with integument, mobility, sensory functioning, endocrine functioning and urinary elimination in various age groups.

Prerequisites: BIO 2312, PSY 2301, NUR 1010, NUR 1030; *Corequisites:* BIO 3302, NUR 1130

NUR 1130 Caring for Clients with Common Alterations in Survival Needs

3 cl hrs, 6 lab hrs, 5 cr

This course builds on the knowledge and skills attained in the previous nursing course Foundations of Caring

(NUR 1030). Using Watson's caring model, the student learns to apply the nursing process in acute care settings to meet the needs of clients experiencing common alterations in human survival needs. Theory includes conditions that interfere with fluid and electrolyte balance, nutrition and oxygenation in various age groups.

Prerequisites: BIO 2312, PSY 2301, NUR 1010, NUR 1030; *Corequisites:* BIO 3302, NUR 1110

NUR 2110 Caring for Clients with Complex Alterations in Survival and Functional Needs

3 cl hrs, 6 lab hrs, 5 cr

In this course, the student learns to use Watson's caring model to meet the needs of clients in various age groups with altered cell growth (cancer), complex alterations in nutrition and oxygenation and the neurological alterations. Focus is on the use of the nursing process to help with decision-making in the care of selected clients and families in acute care settings. Students learn the role of the community-based nurse in the preventative management of complex alterations.

Prerequisites: BIO 3302, NUR 1110, NUR 1130; *Corequisite:* NUR 2130

NUR 2130 Caring for Clients with Alterations in Integrative Needs

2 cl hrs, 6 lab hrs, 4 cr

In this course, the student continues to use the framework of Watson's caring model to study and care for clients with alterations in integrative needs. Emphasis is on applying the nursing process to the care of clients with affective, thought, anxiety, personality and addictive disorders and children with adjustment disorders. The student will integrate mental health concepts, principles of human relationships and interpersonal skills in caring for selected clients in a therapeutic environment.

Prerequisites: BIO 3302, NUR 1110, NUR 1130; *Corequisite:* NUR 2110

NUR 2210 Caring for Clients with Chronic Alterations in Human Needs

3 cl hrs, 6 lab hrs, 5 cr

In this course, the student continues to use the framework of Watson's caring model to meet the needs of clients in various age groups with chronic alterations in nutrition, bowel elimination, urinary elimination,

sensory/motor functioning, oxygenation, tissue perfusion and immune responses. Focus is on the application of the nursing process to manage the care of clients and groups of clients in acute care, long-term care and community health settings.

Prerequisites: NUR 2110, NUR 2130

NUR 2230 Caring for Clients and Families with Growth-Seeking Needs

3 cl hrs, 6 lab hrs, 5 cr

In this course, the student continues to use the framework of Watson's caring model in meeting the growth-seeking needs of childbearing clients and their growing families. Emphasis is on family-centered health care and health teaching of childbearing clients and families in ambulatory and inpatient care settings. Students use the nursing process to organize care for clients with alterations in growth-seeking needs.

Prerequisites: NUR 2110, NUR 2130

NUR 3010 Physical Assessment

2 cl hrs, 2 lab hrs, 3 cr

Health assessment skills and techniques to conduct of a comprehensive health history and physical exam are developed for generalist nursing practice. Students critically analyze interview data and assessment findings that relate to the specific needs of individuals concerning age and culture. The normal parameters of health are used to compare and contrast the findings. Discussions will include health screening across the life span and associated health promotion practices as recommended by *Healthy People 2020*.

Prerequisite: AAS degree with major in Nursing or approval of BS program coordinator

NUR 3100 Interprofessional Communication, Collaboration, and Quality Care in Health and Human Services

3 cl hrs, 3 cr

This interprofessional course for students in upper division baccalaureate programs in health and human services professions is designed to prepare students for the critical necessity of interprofessional communication and collaboration within health care settings. Students participate in health-related simulation and technology aided exercises to explore the roles of

various health professionals. They learn how they can collaboratively influence patient care, safety, overall health, and the promotion of well-being outcomes.

Prerequisite: Allied health associate degree or admission to one of the baccalaureate-granting programs in Nursing, Radiologic Sciences, Human Services, or Health Services Administration

NUR 3110 Leadership in the Management of Client Care

2.5 cl hrs, 5 lab hrs, 5 cr

This course introduces the student to concepts of leadership and management for application in practice settings. Theories relating to nursing, culture, change, motivation, organization and management are explored. Principles of time management, leadership styles, budgeting, staffing patterns, personnel evaluations, delegation and the steps of discipline, and JCAHO accreditation criteria will be discussed and analyzed across diverse practice settings. In clinical settings, student/nurse manager dyads provide students with a vantage point to observe the nurse manager role, responsibilities and associated demonstrated interventions that produce positive client outcomes, staff satisfaction and professional growth.

Pre- or corequisite: NUR 3010

NUR 3130 Nursing Research

3cl hrs, 3 cr

Students will develop skills to critically read, analyze and use knowledge gained from reported research findings for evidence-based practice. The steps of the research process are presented which provide the framework for critiquing research studies that used both qualitative and quantitative methods. Students conduct a review of the nursing literature and critique a selection of nursing research articles that focus on clinical nursing research. Students formulate a research problem and apply the elements of the research process in a hypothetical study. The ethical issues involved in nursing research, theoretical frameworks for nursing research and the nurse's role as a member of a research team to forward research dissemination are discussed.

Prerequisites: AAS degree with major in Nursing, MAT 1272

NUR 4010**Community Health Nursing***2.5 cl hr, 5 lab hrs, 5 cr*

This course builds upon the student's knowledge of nursing and provides the requisites for practice as a community-health nurse. The focus is on health promotion, prevention and maintenance, which is the core of community-based care. Selected concepts such as evidence-based care that contributes to the foundation of community-based nursing will be discussed. The course will examine historical perspectives, the value of community health, the nurse's present-day professional expectations and accompanying changes in responsibilities, accountability for practice and ethical and transcultural considerations. The curriculum will focus on specific contemporary community health issues including homelessness, communicable diseases, mental health and preparedness for bioterrorism.

Prerequisites: NUR 3010, NUR 3130, BIO 3524

NUR 4020**Women's Health and Wellness across the Life Continuum***3 cl hrs, 3 cr*

The course uses a holistic framework incorporating physical, psychosocial, socioeconomic, family and spiritual domains to address issues affecting women's health states, well-being and quality of life, as well as strategies for developing interventions.

Prerequisites: NUR 3010, NUR 3110, NUR 3130 or Coordinator of Baccalaureate Nursing Program approval

NUR 4030**Nursing Case Management: Role and Process***3 cl hrs, 3 cr*

This course focuses on innovative, integrated nursing case and care management models within the context of assessment, planning, implementation, collaboration, negotiation and evaluation. The critical competencies and strategies in managing risk and legal liabilities, seeking and obtaining physician support, coordination of services across placement settings and client and caregiver education are discussed. An emphasis will be on teaching-learning principles and strategies effective in the management of care for diverse populations in urban settings. Students will discuss functions and issues in evolving role demands, opportunities and responsibilities of the nurse case manager.

Prerequisites: NUR 3110, NUR 3130, BIO 3524; Corequisites: PSY 2404, NUR 4010, or BS coordinator approval

NUR 4040**HIV/AIDS Advocacy and Care***3 cl hrs, 3 cr*

An examination of the fundamentals required for practice as a registered professional nurse administering care to clients infected with Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS). The emphasis is on evidence-based, holistic and safe nursing care in achieving and supporting the optimal health and welfare of persons with HIV/AIDS across life spans and settings.

Prerequisites: NUR 3010, NUR 3110, NUR 3130 or the coordinator of bachelor of science in Nursing program approval

NUR 4050**Family-Centered End-of-Life Care Across the Life Span***3 cl hrs, 3 cr*

This course explores nurses' involvement in family-centered end-of-life care. How a health-care team approach can address the myriad needs facing individuals and their families at this time of life are discussed. Principles of hospice and palliative care will be used as a guide for this curriculum. Factors involved in expert nursing care which have the potential to greatly reduce the burden and distress of those facing life's end and the ability to offer support for the physical, psychological, social and spiritual needs of patients and their families are presented.

Pre- or corequisites: NUR 3110, NUR 3130, or approval of BS program coordinator

NUR 4070**Nursing Informatics***3 cl hrs, 3 cr*

A comprehensive introduction to the use of computers to identify, gather, and process information used in the management of client care. Emphasis on technology-based health applications which support clinical, administrative, research, and educational decision-making that enhances efficacy. Ethical, legal and confidentiality issues related to the use of electronic health care records.

Prerequisite: MST 1101, or demonstrated computer literacy; Pre- or corequisite: NUR 3110, NUR 3130, or approval of BS program coordinator

NUR 4080**Communication and Behavior in Nursing***3 cl hrs, 3 cr*

This course builds on prior knowledge of psychological aspects of health and illness and nursing interventions in the prevention, response and

management of potential and actual disease, injury and illness.

The course focuses on developing expert communications skills when communicating with other health care providers, patients and their families and when communicating professional information through writing, speaking, and professional presentations. Students will also develop understanding and competence in intervening in a wide array of cognitive, emotional, socio-cultural and behavioral states. Theories relating to communication, nursing, culture, motivation, and behavior are discussed.

Prerequisite: NUR 3010

NUR 4090**Geriatric Nursing***3 cl hrs, 3 cr*

A comprehensive exploration of the needs of older adults within health care settings and in the community. Students will acquire a conceptual foundation for evidence-based gerontological nursing practice. The course builds upon the student's knowledge of nursing. This course focuses on the interactions among aging, disease, functional ability, the environment, and health disparities of older adults. Discussions will include health promotion practices as recommended by *Healthy People 2020*.

Pre- or corequisite: NUR 3010, NUR 4010

NUR 4110**Comprehensive Client Care for Urban Health Issues***2.5 cl hr, 5 lab hrs, 5 cr*

This course builds upon the students' knowledge of nursing, biological and social sciences, and information technology for assuming nursing roles in health care of culturally diverse clients in urban settings. The curriculum will include global health issues as they relate to such areas as disease transmission, health policy, the adequacy of services provided, and strategies to enhance access to care. The economics and political implications for care in urban settings are discussed. Students will examine political forces and proactive nursing responses that forward health promotion and prevention interventions in urban settings.

Pre- or corequisite: NUR 4030

NUR 4130**Professional Nursing Practice***3 cl hrs, 3 cr*

A variety of professional, historical, theoretical, ethical and health-related issues relevant to contemporary nursing are discussed. Students will use a variety of professional tools

such as in-class forums to debate relevant health care issues, the resume, a portfolio and template for a project proposal for enhancement of professional development.

Prerequisites: NUR 3110, NUR 3130

Radiologic Technology and Medical Imaging

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PROGRAMS:

Radiologic Technology/AAS
Radiological Science/BS

FACULTY:

Associate Professor: Bonsignore
Assistant Professors: DeVito, Ingrassia, Lespinasse, Lobel, Vinokur

CLT: Douglas

RADIOLOGIC TECHNOLOGY AND MEDICAL IMAGING

The Department of Radiologic Technology and Medical Imaging offers students two programs; an associate in applied science (AAS) in Radiologic Technology and Medical Imaging and a bachelor of science (BS) in Radiological Science. Candidates for the AAS program must commit to a day-time only, full-time regimen for two complete years; including fall, spring and summer sessions. Upon completion of all degree requirements for the AAS degree (65 credits), students will be eligible to sit for their board exam for certification and licensure. Graduates will be equipped with all the necessary academic and clinical skills that will make them immediately employable.

The BS in Radiological Science degree (requiring 55 additional credits - total 120 credits) is designed for students who have completed a medical imaging or radiation therapy program and are interested in acquiring in-depth knowledge and leadership skills in the fast moving field of Radiological Science and achieving meaningful professional advancement. Potential applicants include credentialed radiographers, ultrasound technologists, nuclear medicine technologists, and radiation therapists who aspire to advance into leadership roles in Radiology. This program incorporates a curriculum that specifically addresses rapidly changing technology and the growing need for multi-modal medical imaging and therapy practitioners. We are proud to offer this unique educational opportunity in a collegiate and yet comfortable environment. The BS program is open for enrollment year-round and students may enroll part-time or full-time; day, evening or online sessions

Associate in Applied Science in RADIOLOGIC TECHNOLOGY

Accreditation

The Radiologic Technology and Medical Imaging program in diagnostic radiography is accredited by the Joint Review Committee on Education in Radiologic Technology and the New York State Department of Health, Bureau of Environmental Radiation Protection.

Joint Review Committee on Education in Radiologic Technology (JRCERT)

20 North Wacker Drive – Suite 2850

Chicago, IL 60606-3182

312.704.5300

www.jrcert.org

New York State Department of Health (NYSDOH)

Bureau of Environmental Radiation Protection

ESP, Corning Tower, 12th Floor

Albany, NY 12180-2216

518.402.7570

www.health.state.ny.us

Radiologic Technology and Medical Imaging

The radiologic technologist utilizes ionizing radiation to produce radiographic images of various parts of the body to aid in the detection of injury or disease. In recent years, the increasing complexity of radiologic procedures and the continuing emphasis upon the elevation of prescribed standards of practice set forth by the Bureau of Environmental Radiation Protection of New York State have made radiologic technology and medical imaging a highly specialized and sophisticated science requiring competently trained and licensed personnel.

City Tech's comprehensive program provides students with the special knowledge and skills required for the practice of radiologic technology and medical imaging.

Mission Statement

The mission of the Department of Radiologic Technology and Medical Imaging is to prepare a diverse population of students for entry into the profession of radiologic imaging and advanced education opportunities.

Program Goals

- Graduates will be competent in clinical components of radiologic technology.
- Graduates will communicate effectively in a health care setting.
- Graduates will demonstrate skills in critical thinking and problem-solving.
- Graduates will enter the field of radiologic technology and practice with a high degree of ethics and professionalism.

Required Functional Abilities and Technical Standards

The following functional abilities will be necessary to successfully complete the Radiologic Technology and Medical Imaging program. This information is provided to allow the student to assess his/her own capabilities. The functional abilities may be performed with reasonable accommodation. Students with special needs may refer to the New Student Center, the Counseling Services Center and Center for Student Accessibility.

To ensure patient safety throughout the program, the student must be able to:

- Assist in positioning patients who may be comatose, paralyzed, or otherwise incapacitated, from wheelchairs and beds to x-ray tables, and vice versa;
- Position, place, and move heavy equipment including cassettes, portable x-ray machines and overhead equipment such as the x-ray tube mounted on the ceiling;
- Respond to sound and light signals from control panels and exposure switches over distances of up to of 15 feet;
- Respond to sound and light signals to determine and recognize equipment malfunction;
- Determine differences in gradual changes in blacks, grays and whites for purposes of judging radiographs or digital images for technical quality;
- Communicate verbally and in writing in the English language with patients and other health care personnel;
- Fill syringes and enema bags, manipulate locks on imaging equipment;
- Practice effective isolation procedures and maintain the integrity of a sterile field;
- Utilize keyboard and/or barcoding devices to input clinical data into computer systems;
- Tolerate physical and emotional stress and continue to exercise good judgment and think critically

Career Opportunities

The graduate of the program is eligible to take the American Registry of Radiologic Technologists (ARRT) examination for certification and New York State Licensure. Our graduates are employed at (among others) of this program are Brookdale University Hospital & Medical Center, Brooklyn Hospital, Hospital for Special Surgery, NYU Lutheran Medical Center, Maimonides Medical Center, New York Presbyterian Hospital: New York Weill Cornell Medical Center, New York Presbyterian Hospital: Columbia University Medical Center, Mount Sinai St. Lukes Hospital Center, Mount Sinai West and Woodhull Medical and Mental Health Center.

Admission Requirements

- A high school diploma or its equivalent (GED)
- CUNY proficiency in reading, writing and mathematics
- Prerequisites for BIO 2311: BIO 1101 and BIO 1101 Lab, a college-level general biology course with a lab and a minimum grade of "C" or a score of 85 or above on the New York State Regent's exam.

NOTE: Students who are admitted to the College as an Undeclared Health major (UDH) may apply for a change of curriculum to the Radiologic Technology program after they have successfully completed BIO 2311. After completing all pre-requisite courses, students may be selected to start the clinical phase of the program. Undeclared Health students who have not been admitted into the Radiologic Technology program by the completion of the 30th credit will be required to select another major. If you receive state aid and do not change your major by the 30th credit, there may be a disruption in your eligibility for state aid. For more detailed information regarding eligibility for state aid please refer to the Financial Aid section under New York State Financial Aid programs.

The educational requirements of the program include didactic and clinical training. As specified by the JRCERT, clinical training is an essential component achieved through internship programs with affiliated hospitals. The hospitals require criminal background check, drug tests and proof of students' legal presence in the US. If a clinical affiliate determines that a student may not take part in its training program

based on the results of a criminal background check, drug tests or immigration status, the student will be unable to complete the clinical course requirements must therefore withdraw from the program.

Any student entering the program who has a misdemeanor, felony record or conviction is required to self-disclose to the American Registry of Radiologic Technologists at www.arrt.org or call 651.687.0048, and New York State Department of Health at www.health.state.ny.us, or call 518.402.7570. This must be done either before or upon acceptance to the clinical phase of the program; even if there was a negotiated plea or dismissed sentence. Failure to report this information is considered non-disclosure which is a serious infraction that could result in severe penalties including ineligibility or revocation of certification and registration.

Pre-Requisites (Pre-Clinical)

To be considered for admission into the clinical phase of the program, a student must demonstrate CUNY proficiency in reading, writing and mathematics; eligibility for MAT 1275, BIO 2311 (Anatomy and Physiology I); successful completion of ENG 1101; and a minimum grade point average of 2.7.

Progression to Clinical Courses

The clinical phase of the program starts only in the fall of each year. Eligible students who have completed all prerequisites are selected during the spring advisement period. Students who complete the prerequisites at the end of the spring semester or summer will be considered only if spaces are available. Students will be required to complete the clinical phase of the program within three years.

If the number of eligible students exceeds the available spaces, seats will be allocated on the basis of the student's academic record and GPA. An index of 2.7 is the minimum requirement and does not guarantee admission into the clinical phase of the program. As the GPAs of the potential applicants increase, a higher GPA will be needed to qualify.

Performance Standards

Once a student is admitted to the clinical phase of the program, he or she must:

- Attend classes in the fall, spring and summer sessions as a full time student from Monday to Friday, 8:30 am to 4:30 pm.
- Submit documented evidence of a complete physical examination demonstrating good health. The Health Examination Form is provided by the department; students are responsible for satisfying NYS immunization and hospital affiliates immunization requirements. Evidence of a negative tuberculin skin test (ppd) and a seasonal flu vaccine are required.
- Maintain a minimum grade of "C" in each course designated with the prefix RAD. Any student earning a grade lower than "C" in a RAD course may not progress in the program without repeating the course and earning a minimum grade of "B-". No course in the program may be repeated more than once.
- Successfully complete all semester requirements
- Comply with all program and hospital affiliate policies and procedures
- Provide documented evidence of the JRCERT required computer literacy by completing a basic computer course or successful completion of the Self Paced Multimedia Program offered by the Learning Center.
- Maintain the college academic requirement (2.0 GPA) for graduation

Please note that the number of seats in any course designated RAD is strictly limited. If the number of students seeking to enroll in a course designated RAD exceeds the number of seats, first priority for available seats will be given to eligible students who have not previously enrolled in that course. After all such students have had a reasonable opportunity to enroll, students seeking to repeat the course may be given access to the remaining seats, if any. All students seeking to repeat a given course will be ranked by their numeric final grades in that course, and none will be permitted to enroll until those higher on the list have been given an opportunity. Students who received a grade lower than "C" in two or more RAD courses will be dismissed from the program, as will students whose cumulative averages are below 2.0.

Transfer Procedures

Students who wish to transfer into the Radiologic Technology and Medical Imaging program from another college and/or from other college curricula must adhere to all the general admission requirements of the College and department. To be eligible for admission to the clinical phase of the program, transfer students from other colleges must be in good academic standing, not on probation, and not academically dismissed from continuing in the radiologic technology program at previous college(s). Transfer students from other colleges must be registered at New York City College of Technology for at least one semester prior to being considered for admission to the clinical phase of the program. Transfer students may not be considered for the clinical phase of the program until they have satisfied all the pre-clinical criteria including a minimum college index of 2.7 and space availability.

Because of capacity limitations, students who have completed the prerequisite courses with the minimum 2.7 index or higher will be numerically ranked and seats will be allocated on the basis of the highest cumulative average in the introductory sequence. Due to the high number of applicants to the clinical phase of the program in the past two years, the average GPA, for acceptance to the program has been approximately 3.5 or higher.

Clinical Internship

Students must successfully complete all clinical objectives and course requirements to receive a passing grade. A student can be removed from the internship for any unprofessional behavior, a serious infraction of hospital rules and regulations, or endangering the patient's safety. This may be determined by the hospital and/or faculty and could result in a failing grade and dismissal from the program.

Any absence beyond the department and college policy could result in a failing grade in the class.

Readmission to Radiologic Technology and Medical Imaging

Students who have not registered for the Radiologic Technology and Medical Imaging program for two consecutive semesters will be admitted on a space-available basis with a minimum GPA of 2.7.

Program Outcomes

Graduates of the associate in applied science program will:

- Demonstrate effective oral and written communication skills;
- Demonstrate strong cognitive skills in radiologic technology;
- Effectively plan, prepare for, and carry out procedure requirements according to patient's needs;
- Position patients for radiographic examinations;
- Illustrate appropriate patient care while working with patients;

- Illustrate radiation protection while working with patients;
- Formulate correct exposure factors for radiographic exams.
- Evaluate radiographic images and determine proper course of action;
- Demonstrate proper ethics and professionalism while working with patients;
- Demonstrate understanding of career path in one of the advanced modalities (CT, MRI, Special or Interventional Procedures);
- Satisfy employers with their work ethics and professionalism;

Approximate Additional Costs

Students in the Radiologic Technology and Medical Imaging program will be required to purchase textbooks and incur the following expenses:

Film badge monitoring service.....	\$20 per year paid at the beginning of the first and third semesters;
Special film for open laboratory.....	\$10 paid at the beginning of the first three semesters
Professional liability coverage for the minimum limits of for professional and personal liability.....	\$15 per year paid at the beginning of the second and fourth semesters
Trajecsys.....	\$150 paid at the end of the first fall semester
Castle Brach.....	\$175.75 paid at the beginning of the first fall semester
Estimated textbook costs of \$1,000	
Lab coat for radiographic procedures	\$22
Uniforms, shoes and additional lab coat for the clinical education courses	\$100 or more at the beginning of the second semester.
(Uniforms and lab coats must have the department emblem on the left sleeve)	
Pinning Fee	\$125
CPR Certification.....	\$100
The American Registry of Radiologic Technologists (ARRT) application fee	\$200
New York State Department of Health (NYSDOH) NYS license application fee	\$120

GENERAL EDUCATION COMMON CORE¹

21 CREDITS

I – REQUIRED CORE² (3 COURSES, 11 CREDITS)

English Composition (1 courses, 3 credits)

ENG 1101	English Composition I	3
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Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1275 or higher ³	College Algebra and Trigonometry	4
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Life and Physical Sciences (1 course, 4 credits)

BIO 2311 ⁴	Human Anatomy and Physiology	4
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II – FLEXIBLE CORE (3 COURSES, 10 CREDITS)

Individual and Society

PHIL 2203	Health Care Ethics	3
PSY 1101	Introduction to Psychology	3

Scientific World

BIO 2312 Human Anatomy and Physiology II 4

Writing Intensive Requirement⁵

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 44 CREDITS

RAD 1124	Introduction to Radiologic Technology and Medical Imaging	1
RAD 1125	Radiographic Procedures I	2
RAD 1126	Image Production and Evaluation I	2
RAD 1127	Patient Care and Management	2
RAD 1128	Radiation Protection and Applied Radiobiology	2
RAD 1225	Radiographic Procedures II	2
RAD 1226	Image Production and Evaluation II	2
RAD 1227	Radiographic Pathology	3
RAD 1228	Clinical Education I	2
RAD 1229	Clinical Education II	3
RAD 2325	Radiographic Procedures III	2
RAD 2326	Radiographic Physics	2
RAD 2327	Cross-Sectional Anatomy	2
RAD 2328	Clinical Education III	3
RAD 2425	Advanced Radiographic Procedures	2
RAD 2426	Imaging Modalities	2
RAD 2427	Seminar: Film Critique	2
RAD 2428	Clinical Education IV	3
RAD 2429	Clinical Education V	2
MAT 1275	College Algebra and Trigonometry	Met as GenEd
BIO 2311	Human Anatomy and Physiology I	Met as GenEd
BIO 2312	Human Anatomy and Physiology II	Met as GenEd
PHIL 2203	Health Care Ethics	Met as GenEd
PSY 1101	Introduction to Psychology	Met as GenEd
COM 1330	Public Speaking	3

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 44

TOTAL GENERAL EDUCATION CREDITS 21

TOTAL CREDITS REQUIRED FOR THE DEGREE 65

¹ Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program

² Specific courses listed are degree requirements that also meet CUNY Pathways general education requirements in that category.

³ Students who elect to take MAT 1275 without the requisite math background will be required to take MAT 1175 in preparation, depending upon initial placement. This will increase the number of required credits for the degree by 4.

⁴ Students without requisite science background for BIO 2311 will be required to take BIO 1101 in preparation. This will increase the number of credits required for the degree by 4.

⁵ A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

Bachelor of Science in RADIOLOGICAL SCIENCE

The bachelor of science in Radiological Science degree program provides an avenue for professional and personal development for credentialed radiographers, nuclear medicine technologists, radiation therapists and sonographers. The goal of the program is to provide a Bachelor's degree for graduates of an associate or certificate program accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT) and who are registered by the American Registry of Radiologic Technologists (ARRT) or equivalent. This program will enhance the students' education and provide a professional radiologic science curriculum essential for advanced clinical practice, leadership, management, and graduate study.

Designed as the upper division of a 2 + 2 model (AAS + BS), the program prepares graduates of associate degree and hospital based certificate-level medical imaging programs with the education and skills necessary to facilitate career advancement and professional growth. This upper level BSRS program will advance the profession of medical imaging by providing credentialed medical imaging practitioners the educational opportunity to obtain their baccalaureate degree in radiological science.

Students entering the program with an associate degree in radiologic technology may have up to 65 credits of course work that was required for the AAS degree transferred toward the 120-credit BS degree (Additional credits will be evaluated). Graduates of certificate-level programs may have up to 41 credits for the radiologic technology curriculum transferred toward the BS degree (Additional credits will be evaluated).

Program Outcomes

Graduates of the bachelor of science in Radiological Science will:

- Demonstrate advanced skills in patient care and management;
- Demonstrate effective oral and writing communication techniques;
- Demonstrate academic skills in advanced imaging technology: CT, MR, etc;
- Identify the appropriate imaging modality when clinically indicated;
- Apply critical thinking and problem solving skills in making independent and professional decisions;
- Demonstrate and identify aspects of an effective leader in medical imaging.

Admission Criteria

Applicants for a bachelor of science degree with a major in Radiological Science must be graduates of a degree-granting college or certificate-granting medical imaging programs that prepare students for certification and licensure.

Candidates for admission to the baccalaureate program with an associate degree must have:

- Met the admission requirements for the college.
- Graduated from an Associate Degree program in medical imaging (radiography, nuclear medicine, radiation therapy and sonography) accredited by the Joint Review Committee in Radiologic Technology (JRCERT).

- A current state license.
- The American Registry of Radiologic Technologist (ARRT) certification currently registered.
- A 2.5 cumulative grade point average (GPA) on a 4-point scale. Preference will be given to applicants with a 3.0 cumulative index (GPA) or above.

Students applying to the program will be admitted based on space availability.

Candidates for admission to the baccalaureate program who hold a certificate in medical imaging must have:

- Met the admission requirements for the college and CUNY requirements in reading, writing and mathematics.
- Graduated from an approved JRCERT program in medical imaging (radiography, nuclear medicine, radiation therapy and sonography).
- A current state license.
- A current American Registry of Radiologic Technologist (ARRT) certification.
- A 2.5 cumulative grade point average (GPA). Preference will be given to applicants with a 3.0 cumulative index (GPA) or above.
- Successful completion of all pre-major course requirements.

Progression in the BSRS Program

- A 2.5 cumulative grade point average must be maintained.
- Students must achieve a minimum grade of "C" in all (RAD) courses and required courses in the curriculum.

Transfer into the BSRS Program

- Transfer students are required to follow College policies.
- The request to transfer non-CUNY medical imaging credits will be evaluated on an individual basis by a Radiological Science coordinator or program advisor and an official decision will be made by the Registrar.
- All students entering the program must show proof of completion of an approved program and a current copy of their state licensure and ARRT registration.

CUNY Articulation Policy

Formal CUNY AAS articulation agreements are in effect with Bronx Community College and Hostos Community College.

Readmission to the BSRS program

Students applying for re-admission to the program will be admitted based on space availability.

Graduation from the BS Degree in Radiological Science Program

- A minimum 2.5 cumulative grade point average in the required 120 credits is necessary for graduation from the radiological science program.

Suggested Time for Completion

- Full-time students can complete the degree requirements in one to two years.
- Part-time students are expected to complete the requirements for the degree in five years.

GENERAL EDUCATION COMMON CORE¹

45 CREDITS

I – REQUIRED CORE² (4 COURSES, 14 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101*	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 3-4 credits)

MAT 1275 or higher ^{3,*}	College Algebra and Trigonometry	4
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Life and Physical Sciences (1 course, 4 credits)

BIO 2311 ^{4,*}	Human Anatomy and Physiology I	4
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II – FLEXIBLE CORE (6 COURSES, 19 CREDITS)

In addition to the required courses listed below, select one course from each of the other two areas; no more than two courses may be selected from any discipline.

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course		
ECON 1101	Macroeconomics (recommended)	3

Individual and Society

PHIL 2203*	Health Care Ethics	3
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Creative Expression

Any Approved Course

Scientific World

BIO 2312*	Human Anatomy and Physiology II	4
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One additional course from any Flexible Core area

PSY 1101*	Introduction to Psychology	3
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III – COLLEGE OPTION REQUIREMENT⁵ (12 CREDITS)

- One course in Speech/Oral Communication⁶
COM 1330* Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course 3
- Two additional liberal arts courses 6

In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language.

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

60 CREDITS

Associate-Level Courses in Radiologic Technology and Medical Imaging (41 credits)

RAD 1124	Introduction to Radiologic Technology and Medical Imaging	1
RAD 1125	Radiographic Procedures I	2

RAD 1126	Image Production and Evaluation I	2
RAD 1127	Patient Care and Management	2
RAD 1128	Radiation Protection and Applied Radiobiology	2
RAD 1225	Radiographic Procedures II	2
RAD 1226	Image Production and Evaluation II	2
RAD 1227	Radiographic Pathology	3
RAD 1228	Clinical Education I	2
RAD 1229	Clinical Education II	3
RAD 2325	Radiographic Procedures III	2
RAD 2326	Radiographic Physics	2
RAD 2327	Cross-Sectional Anatomy	2
RAD 2328	Clinical Education III	3
RAD 2425	Advanced Radiographic Procedures	2
RAD 2426	Imaging Modalities	2
RAD 2427	Seminar: Film Critique	2
RAD 2428	Clinical Education IV	3
RAD 2429	Clinical Education V	2
Baccalaureate-Level Courses in Radiological Science (19 credits)		
RAD 3527	Advanced Patient Assessment – Pharmacology	3
RAD 3627	Advanced Sectional Anatomy	2
RAD 3628	Pathophysiology for Medical Imaging	2
RAD 4726	Advanced Medical Imaging I	3
RAD 4826	Advanced Medical Imaging II	3
RAD 4828	Medical Informatics/QM HIS	3
RAD 4830	Capstone Leadership Roles in Medical Imaging	3
Other Program-Specific Required Courses (15 credits)		
MAT 1275*	College Algebra and Trigonometry or higher	Met as GenEd
BIO 2311*	Human Anatomy and Physiology I	Met as GenEd
BIO 2312*	Human Anatomy and Physiology II	Met as GenEd
PHIL 2203*	Health Care Ethics	Met as GenEd
PSY 1101*	Introduction to Psychology	Met as GenEd

ECON 1101	Macroeconomics	3
MAT 1272	Statistics	3
PHYS 2603	Physical Principles of Medical Imaging	3
PSY 3405 ⁷	Health Psychology	3
LIB 1201	Research and Documentation in the Information Age	3
Elective Credits as needed to equal 60 credits of Liberal Arts and Sciences or otherwise meet degree requirements		
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES		78
TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS		42
TOTAL CREDITS REQUIRED FOR THE DEGREE		120
* Courses required for associate degree		
1 The BS in Radiologic Science is built on the AAS in Radiologic Technology and Medical Imaging using a 2+2 model. Courses required for the AAS in Radiologic Technology and Medical Imaging at New York City College of Technology are indicated by *. Requirements for transfer students from CUNY institutions will be governed by CUNY Pathways policy and existing articulation agreements. Transfers from outside of CUNY will be evaluated individually.		
2 Students are strongly urged to consult degree requirements for "double-duty" courses: degree requirements that also meet CUNY Pathways general education requirements in that category.		
3 Students who elect to take MAT 1275 without the requisite math background will be required to take MAT 1175 in preparation, depending upon initial placement. This will increase the number of required credits for the degree by 4.		
4 Students without requisite science background for BIO 2311 will be required to take BIO 1101 in preparation. This will increase the number of credits required for the degree by 4.		
5 Complete lists of liberal arts and sciences courses and advanced liberal arts courses, as well as semester-specific lists of interdisciplinary courses and writing intensive courses, are available online at the City Tech Pathways website .		
6 Students who have already met this requirement may choose any other liberal arts and science course in its place.		
7 Acceptable substitutes for this requirement are PSY 2302, PSY 2401, PSY 2402, PSY 2403, PSY 2404, and PSY 2501.		

COURSES:

RAD 1124
Introduction to Radiologic Technology and Medical Imaging
(fall and spring)
1 cl hr, 1 cr
Introduction to the various imaging procedures performed by radiologic technologists. This course may be taken by students who are not eligible for other RAD courses.
Prerequisites: CUNY proficiency in reading, department approval required

RAD 1125
Radiographic Procedures I
(fall only)
1.5 cl hrs, 1.5 lab hrs, 2 cr
Materials fee \$30
This course introduces the student to basic radiographic positioning and

related anatomy with emphasis on the skeletal system and extremities. In the laboratory, students develop positioning skills needed for clinical practices.
Prerequisite: CUNY proficiency in reading, writing and mathematics;
Corequisites: RAD 1124, RAD 1126, RAD 1127, RAD 1128, BIO 2311

RAD 1126
Image Production and Evaluation I
(fall only)
1.5 cl hrs, 1.5 lab hrs, 2 cr
This course introduces the student to accessory radiographic equipment, darkroom procedure, radiographic mathematics and principles of exposure techniques. In the laboratory, students develop technical

skills needed for image production.
Prerequisite: CUNY proficiency in reading, writing and mathematics;
Corequisites: RAD 1124, RAD 1125, RAD 1127, RAD 1128, BIO 2311, MAT 1275 or higher

RAD 1127
Patient Care and Management
(fall only)
1.5 cl hrs, 1.5 lab hrs, 2 cr
In this course the students learn general patient care and safety; first aid in emergencies; infection control and aseptic techniques; fundamentals of ethics and the law and basic medical terminology.
Prerequisite: CUNY proficiency in reading, writing and mathematics;
Corequisites: RAD 1124, RAD 1125, RAD 1126, RAD 1128, BIO 2311

RAD 1128
Radiation Protection and Applied Radiobiology
(fall only)
2 cl hrs, 2 cr
A study of general methods of radiation protection when exposing patients to ionizing radiation critical to patient safety and the safety of the radiographer. Biological effects and the basic mechanism of short-term and long-term effects of ionizing radiation are covered.
Prerequisite: CUNY proficiency in reading, writing and mathematics;
Corequisites: RAD 1124, RAD 1125, RAD 1126, RAD 1127, BIO 2311

RAD 1225**Radiographic Procedures II***(spring only)**1.5 cl hrs, 1.5 lab hrs, 2 cr**Materials fee \$30*

In this course the students continue to learn radiographic positioning and related anatomy with emphasis on basic positioning for skull, thorax and spine; includes practice positioning in lab.

Prerequisites: RAD 1224, RAD 1125, RAD 1126, RAD 1127, RAD 1128, BIO 2311; *Corequisites:* RAD 1226, RAD 1227, RAD 1228, BIO 2312

RAD 1226**Image Production and Evaluation II***(spring only)**1.5 cl hrs, 1.5 lab hrs, 2 cr*

The course is a continuation of RAD 1126, with an emphasis on automatic processing, related mathematics and an in-depth study of factors contributing to radiographic quality. Laboratory experiments include applied exposure principles using the phantom and film critique.

Prerequisites: RAD 1124, RAD 1125, RAD 1126, RAD 1127, RAD 1128, BIO 2311, MAT 1275 or higher; *Corequisites:* RAD 1225, RAD 1227, RAD 1228, BIO 2312

RAD 1227**Radiographic Pathology***(spring only)**3 cl hrs, 3 cr*

A study of disease processes of the body systems, related radiographic examinations and related terminology.

Prerequisites: RAD 1124, RAD 1125, RAD 1126, RAD 1127, RAD 1128, BIO 2311; *Corequisites:* RAD 1225, RAD 1226, RAD 1228, BIO 2312

RAD 1228**Clinical Education I***(spring only)**13 clinical hrs per week, 2 cr*

A 30-day internship designed to integrate the didactic and practical concepts learned in the radiologic technology laboratories. Emphasis is placed on patient care, patient positioning, radiation protection and image production. Film critique and case presentation are required.

Prerequisites: RAD 1124, RAD 1125, RAD 1126, RAD 1127, RAD 1128, BIO 2311, ENG 1101; *Corequisites:* RAD 1225, RAD 1226, RAD 1227, BIO 2312

RAD 1229**Clinical Education II***(summer session, 7 weeks)**32.5 clinical hrs per week, 3 cr*

A continuation of RAD 1228, which includes a 35-day internship designed

to integrate didactic and clinical concepts. Emphasis is placed on laboratory experiences learned in RAD 1225. Film critique classes are held weekly.

Prerequisites: RAD 1225, RAD 1226, RAD 1227, RAD 1228, BIO 2312

RAD 2325**Radiographic Procedures III***(fall only)**1.5 cl hrs, 1.5 lab hrs, 2 cr**Materials fee \$30*

This course is a continuation of RAD 1225 with an emphasis on more advanced radiographic positioning and procedures. Practical laboratory experiences include advanced skull and spine procedures.

Prerequisites: RAD 1225, RAD 1226, RAD 1227, RAD 1229; *Corequisites:* RAD 2326, RAD 2327, RAD 2328

RAD 2326**Radiographic Physics***(fall only)**2 cl hrs, 2 cr*

Instruction in the principles of x-ray generation, x-ray circuits and equipment. Basic concepts of quality management are covered.

Prerequisites: RAD 1225, RAD 1226, RAD 1227, RAD 1229; *Corequisites:* RAD 2325, RAD 2327, RAD 2328

RAD 2327**Cross-Sectional Anatomy***(fall only)**2 cl hrs, 2 cr*

The course emphasizes cross-sectional anatomy as used in medical imaging with a correlation of anatomical structures and sectional images.

Prerequisites: RAD 1225, RAD 1226, RAD 1227, RAD 1229; *Corequisites:* RAD 2325, RAD 2326, RAD 2328

RAD 2328**Clinical Education III***(fall only)**19.5 clinical hrs per week, 3 cr*

A 45-day internship which builds on knowledge and skills attained in previous clinical experiences (RAD 1228, RAD 1229). Student performance is competency based.

Prerequisites: RAD 1225, RAD 1226, RAD 1227, RAD 1229; *Corequisites:* RAD 2325, RAD 2326, RAD 2327

RAD 2425**Advanced Radiographic Studies***(spring only)**2 cl hrs, 2 cr*

Instruction in principles and practice of advanced radiographic procedures and equipment.

Prerequisites: RAD 2325, RAD 2326, RAD 2327, RAD 2328; *Corequisites:* RAD 2426, RAD 2427, RAD 2428

RAD 2426**Imaging Modalities***(spring only)**2 cl hrs, 2 cr*

A study of various imaging systems including recent advances in medical imaging.

Prerequisites: RAD 2325, RAD 2326, RAD 2327, RAD 2328; *Corequisites:* RAD 2425, RAD 2427, RAD 2428

RAD 2427**Seminar: Film Critique***(spring only)**1 cl hr, 3 lab hrs, 2 cr**Materials fee \$30*

A comprehensive summary and review of didactic and clinical skills required for entry into medical imaging.

Laboratory exercises in image critique and quality assurance will be covered.

Prerequisites: RAD 2325, RAD 2326, RAD 2327, RAD 2328; *Corequisites:* RAD 2425, RAD 2426, RAD 2428

RAD 2428**Clinical Education IV***(spring only)**19.5 clinical hrs per week, 2 cr*

A 45-day internship which builds on the knowledge and skills attained in previous clinical courses (RAD 1228, RAD 1229, RAD 2328). Student performance is competency based.

Prerequisites: RAD 2325, RAD 2326, RAD 2327, RAD 2328; *Corequisites:* RAD 2425, RAD 2426, RAD 2427

RAD 2429**Clinical Education V***(summer session, 5 weeks)**22.5 clinical hrs per week, 2 cr*

A 24-day internship which builds on the knowledge and skills attained in previous clinical courses (RAD 1228, RAD 1229, RAD 2328, RAD 2428). Student performance is competency based.

Prerequisites: RAD 2425, RAD 2426, RAD 2427, RAD 2428

RAD 3100**Interprofessional Communication, Collaboration, and Quality Care in Health and Human Services***3 cl hrs, 3 cr*

This interprofessional course for students in upper division baccalaureate programs in health and human services professions is designed to prepare students for the critical necessity of interprofessional communication and collaboration within health care settings. Students participate in health-related simulation and technology aided exercises to explore the roles of various health professionals. They learn how they can collaboratively

influence patient care, safety, overall health, and the promotion of well-being outcomes.

Prerequisite: Allied health associate degree or admission to one of the baccalaureate-granting programs in Nursing, Radiologic Sciences, Human Services, or Health Services Administration

RAD 3527**Advanced Patient Assessment – Pharmacology***3 cl hrs, 0 lab hrs, 3 cr*

Advanced patient care skills and assessment. Additionally, an exploration of pharmacology provides the students with comprehensive knowledge concerning drugs used in critical care and their applications in medical imaging: CT, MRI, Cardiovascular, Sonography Nuclear Medicine and Radiation Therapy.

Prerequisite: Admission to the Baccalaureate Program

RAD 3627**Advanced Sectional Anatomy***2 cl hrs, 0 lab hrs, 2 cr*

Students locate and identify structures in the axial, sagittal, coronal and oblique planes. Volumetric data sets and three-dimensional reconstruction of the body structures critical to diagnosis and treatment of diseases are explored. This enhances the students' ability to provide patients in critical care with independent patient care and assist physicians with the prognosis, radiologic science professionals must understand cross-sectional anatomy in each of the imaging modalities.

Prerequisite: Admission to the Baccalaureate Program

RAD 3628**Pathophysiology for Medical Imaging***2 cl hrs, 0 lab hrs, 2 cr*

Focus on various pathological conditions as they are demonstrated by each imaging modality. Emphasis on accurately identifying structures and recognizing abnormalities during advanced radiological imaging procedures. Clinical features of tissue characteristics and the imaging modality best indicated for a specific pathology are discussed.

Prerequisite: Admission to the Baccalaureate Program

RAD 4726**Advanced Medical Imaging I***3 cl hrs, 0 lab hrs, 3 cr*

Introduction to the major components and processes needed to acquire, manipulate, store, and transmit digital MRI and CT information. Students are introduced to general examination

protocol and procedures. Current trends and future applications of these technologies are discussed.

Prerequisite: PHYS 2603

RAD 4826

Advanced Medical Imaging II

3 cl hrs, 0 lab hrs, 3 cr

A continuation of Advanced Imaging I.

Students explore advanced diagnostic imaging and therapeutic procedures. The focus includes specialized modalities such as mammography, nuclear imaging, Positron Emission Tomography (PET), bone densitometry (DEXA), Interventional, Cardiac Catheterization, Fusion Imaging, Sonography, and Radiation Therapy.

Prerequisite: RAD 4726

RAD 4828

Medical Informatics

HIS/RIS/QM

3 cl hrs, 0 lab hrs, 3 cr

An exploration of every aspect of medical informatics from image creation and acquisition to image distribution, reporting, and communications. The quality management content is designed to expand the QM skills of the technologist to include digital imaging systems and the application of QM principles in an imaging department.

Prerequisite: Admission to the Baccalaureate Program

RAD 4830

Capstone Leadership Roles in Medical Imaging

3 cl hrs, 0 lab hrs, 3 cr

Focus on substantive medical imaging ethical and legal aspects, accreditation compliance and non compliance issues. Additional topics include political context of health care organization and delivery, mechanisms for policy formulation and implementation, reporting, and risk management techniques. Students will examine various methods of health delivery and explore complex issues and themes that affect medical imaging, radiation therapy, and allied health education in a substantial writing assignment.

Prerequisites: LIB 1201, RAD 3527, RAD 3627, RAD 3628, RAD 4726, RAD 4828

Restorative Dentistry

Professor Renata Budny, Chair
Pearl Building, room P 409
718.260.5137
email: rbudny@citytech.cuny.edu

PROGRAM:

Dental Laboratory Technology/AAS

FACULTY:

Professors: Manos, Smith
Associate Professor: Alter
Assistant Professors: Budny, Russo, Sena

Associate in Applied Science in DENTAL LABORATORY TECHNOLOGY

The dental laboratory technologist designs, constructs and repairs dental prosthetic appliances according to the dentist's prescription and provides an essential support service for the dental profession. The field requires a degree of manual dexterity, good artistic sense and the ability to understand and interpret the dental prescription.

The program in Dental Laboratory Technology provides a balanced program of study which includes all phases of dental technology, related sciences (chemistry, metallurgy and non-metallic dental materials), dental anatomy, the legal and business aspects of dental laboratory operation and courses in general education as required by the American Dental Association Commission on Dental Accreditation, the board which accredits the dental technology program. In addition to this accreditation, the department has been recognized as a certified dental laboratory by the National Association of Dental Laboratories. City Tech is the first and only college to achieve this certification in all five areas of restorative prosthetic fabrication – complete dentures, orthodontics, partial dentures, ceramics and crown and bridge.

The graduate is prepared for employment in a commercial dental laboratory, in the laboratory of a V.A. hospital, dental school or in a dental office. Some graduates secure employment with dental manufacturers as research assistants or sales representatives. Among the employers of the graduates of this program are Americus Dental Studio, Sloane-Kettering Hospital, Veterans Administration Hospital and Columbia Dental School. Over the years, many graduates have gone on to dental school or to teaching positions in dental technology schools. Many department alumni are the owners of dental laboratories in the New York area. City Tech alumni hold officer positions in every dental laboratory technology association in the surrounding areas.

At the end of the fourth semester, students who have completed all laboratory courses are permitted to take the Recognized Graduate Examination, administered by the National Board for Certification (NBC). Pass rates for our students over the past ten years have averaged 93%. This is the preliminary examination leading to certification (CDT). The final (or practical) portion of the certification examination may be taken in one or more of the specialties after gaining proficiency through experience in the field.

Graduates may pursue baccalaureate degrees at City Tech through the CUNY baccalaureate program, the Career and Technical Teacher Education program or the Health Services Administration program.

Approximate Additional Costs

All dental technology students are required to purchase tools, uniforms and books, which are used during the four semesters.

First Semester

Uniform.....	\$30.00
Tools and Supplies	\$405.09
Books	\$180.00

Second Semester

Tools and Supplies	\$200.00
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Third Semester

Tools and Supplies	\$50.00
Books	\$50.00

Fourth Semester

Tools and Supplies ¹	\$75.00
R.G. Examination ²	\$190.00

¹ May vary according to specialization chosen in fourth semester.

² Recognized Graduate Examination National Board for Certification.

Criteria for Admission into the Program within the Restorative Dentistry Curriculum

Students may apply for admission to the Restorative Dentistry program either as freshmen or through transfer from another curriculum.

Students must achieve a minimum passing grade of "C" in all courses which begin with the prefix RESD. Students may repeat a course only once.

Placement in the Restorative Dentistry Program

A high school diploma or a New York State equivalency diploma is required for admission to the College. However, in order to be registered for the full program of restorative dentistry courses, an applicant must meet CUNY proficiency in reading, writing and mathematics. All new students and transfer students who do not meet the above criteria will be classified as dental laboratory technology students taking introductory courses and will be considered to be members of the Department of Restorative Dentistry. During this period students will be programmed for developmental skills or core courses as needed.

After completion of all required developmental courses with a Satisfactory "S" rating, the student will be admitted to Dental Laboratory Technology courses as space permits. Completion of the introductory portion of the curriculum does not guarantee progression into major courses. If the number of students meeting the stated criteria exceeds the available places, seats will be allocated on the basis of the highest cumulative academic average.

Transfer into the Restorative Dentistry Curriculum

Students who wish to transfer into Restorative Dentistry from another college curriculum must meet the following criteria:

- all prerequisite criteria;
- cumulative grade point average of 2.0 or better.

Program Goals: A Graduate of this Major Should be Able To

- Know generally accepted practices in the fabrication of dental appliances.
- Understand properties of materials used in the fabrication processes.
- Follow instructions from technical manuals.
- Troubleshoot errors occurring in the fabrication processes.
- Use correct dental and anatomical terminology used in restorative dentistry work.
- Apply knowledge of anatomical and physiological aspects to fabrication of appliances.
- Understand how to read and fulfill a dental prescription.
- Use effective communication skills.
- Know proper safety procedures as it pertains to laboratory materials and equipment.
- Exercise discretion and good judgment in all aspects of work.
- Prepare for Recognized Graduate exam in Dental Laboratory Technology.
- Perform all tasks required for Specialty Certification in Dental Laboratory Technology.
- Know infection control procedures as it pertains to Dental Laboratory Technology.
- Apply knowledge of mathematics in determining ratios and converting measurements.
- Read and analyze literature found in the dental field.
- Demonstrate an understanding and support of the profession's code of ethics and comply with the profession's scope of practice.

GENERAL EDUCATION COMMON CORE 20 CREDITS

I – REQUIRED CORE (3 OR 4 COURSES, 11-14 CREDITS)

English Composition (1 or 2 courses, 3 or 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II ¹	[3]

Mathematical and Quantitative Reasoning (1 course, 3-4 credits)

Select one of the following courses

MAT 1190	Quantitative Reasoning ²	3
MAT 1180	Math Concepts and Applications	4
MAT 1275	College Algebra and Trigonometry or higher ³	4

Life and Physical Sciences (1 course, 4 credits)

CHEM 1000	Principles of Chemistry or higher	4
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II – FLEXIBLE CORE (2 OR 3 COURSES, 6 OR 9 CREDITS)

One course from each of any two groups, plus COM 1330 or higher if ENG 1121 is not taken 6

World Cultures and Global Issues

US Experience in its Diversity

Individual and Society

COM 1330	Public Speaking or higher ¹	3
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Creative Expression

Scientific World

PROGRAM-SPECIFIC DEGREE REQUIREMENTS (44 CREDITS)

RESD 1107	Introduction to Non-metallic Dental Materials	2
RESD 1110	Tooth Morphology	3
RESD 1111	Complete Dentures I	3
RESD 1115	Fixed Prosthodontics I	3
RESD 1211	Complete Dentures II	3
RESD 1212	Fixed Prosthodontics II	3
RESD 1215	Introduction to Restorative Ceramics	4
RESD 1216	Removable Partial Dentures I	3
RESD 2307	Science of Dental Metallurgy	1
RESD 2310	Principles of Occlusion	2
RESD 2313	Removable Partial Dentures II	3
RESD 2314	Restorative Dental Ceramics II	3
RESD 2409	Laboratory Operation, Ethics and Jurisprudence	2
RESD 2413	Fixed Prosthodontics Practicum	2
RESD 2415	Orthodontics	2

Select one of the following two courses for 2 credits:

RESD 2311	Complete Dentures III	2
RESD 2324	CAD/CAM in Dentistry	

Select one of the following courses for 3 credits:

RESD 2411	Complete Dentures/Maxillofacial Concepts	3
RESD 2414	Restorative Dental Ceramics Practicum	
RESD 2416	Dental Implant Prosthetics	

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 44

TOTAL GENERAL EDUCATION CREDITS 20

TOTAL CREDITS REQUIRED FOR THE DEGREE 64

¹ Students must select either ENG 1121 or COM 1330 or higher; if ENG 1121 is taken, all approved Individual and Society courses are eligible to fulfill a Flexible Core requirement.

² Students who take MAT 1190 will need one additional general education credit to meet the required 20 credits in liberal arts and sciences. This may be done by taking a 4-credit science or math course or an additional general education course (which will increase the number of required credits for the degree by 2 credits).

³ Students who elect to take MAT 1275 but who lack the requisite math background will be required to take MAT 1175 in preparation. This will increase the number of required credits for the degree by 4 credits.

COURSES:

RESD 1107 Introduction to Non-Metallic Dental Materials

(fall only)

2 cl hrs, 2 cr

An introduction to non-metallic dental materials. The inherent characteristics, uses and limitations of dental laboratory materials are demonstrated and students practice the proper techniques of manipulating the materials in uncomplicated exercises. Familiarization with dental materials facilitates the development of psychomotor skills for subsequent dental laboratory technology courses. Students receive extensive training in infection control which conforms to OSHA, NADL and ADA guidelines. *Prerequisite: CUNY proficiency in reading, writing and mathematics*

RESD 1110 Tooth Morphology

(fall only)

1 cl hr, 6 lab hrs, 3 cr

A detailed study of tooth form, structure and function; drawings of 28 teeth, wax buildup and development of the anatomical crowns for maxillary and mandibular teeth. *Prerequisite: CUNY proficiency in reading, writing and mathematics*

RESD 1111 Complete Dentures I

(fall only)

1 cl hr, 6 lab hrs, 3 cr

Denture fabrication including the interpretation of work authorizations, evaluating casts, fabricating impression trays, constructing baseplates and wax occlusal rims, articulating casts, set-ups, wax-ups and contouring of full dentures. *Prerequisite: CUNY proficiency in reading, writing and mathematics*

RESD 1115 Fixed Prosthodontics I

(fall only)

1 cl hr, 6 lab hrs, 3 cr

An introduction to the theory and practice of fabricating fixed prostheses including construction of casts and dies, identifying margins, trimming and ditching dies, use of self articulation, developing wax patterns for crowns, inlays and onlays. Investing, casting, finishing and polishing of single-unit and provisional restorations. *Prerequisite: CUNY proficiency in reading, writing and mathematics*

RESD 1211 Complete Dentures II

(spring only)

1 cl hr, 6 lab hrs, 3 cr

Full denture construction including postdams, insertion of reliefs, waxing and contouring for processing, flasking, wax elimination, processing, recovery, selective grinding, finishing and polishing of full dentures, relines and repairs. *Prerequisite: RESD 1111*

RESD 1212 Fixed Prosthodontics II

(spring only)

1 cl hr, 6 lab hrs, 3 cr

Knowledge and skills required to fabricate multi-unit fixed bridge restorations. The topics cover the construction of full arch casts and dies, identification margins, trimming dies, waxing and developing functional occlusion, investing, casting, pontic design, soldering precious or non-precious metals, seating and finishing of castings, processing composite to restoration frameworks, provisional restorations and finishing and polishing metal to composite restorations. The fixed portion of an overdenture is also fabricated. *Prerequisite: RESD 1115*

RESD 1215 Introduction to Restorative Dental Ceramics

(spring only)

1 cl hr, 6 lab hrs, 24 hrs externship, 4 cr

An introduction to the theory and techniques of ceramo-metal dental restorations including crowns and pressable all-ceramic restorations. Students perform the techniques required to produce a suitable fixed-dental prosthesis. Laboratory techniques introduced include metal substructure, design and fabrication, porcelain build-up, firing, contouring, finishing and polishing to accuracy. During the summer, externship students will be placed in doctors' offices to gain real world exposure to the dental profession. *Prerequisites: RESD 1110, RESD 1115*

RESD 1216 Removable Partial Dentures I

(spring only)

1 cl hr, 6 lab hrs, 3 cr

An introduction to the theory and practice of removable, partial denture construction. Surveying, designing, duplicating the master casts, wax-up and casting techniques are emphasized. *Prerequisites: RESD 1110, RESD 1111*

RESD 2307 Science of Dental Metallurgy

(spring only)

1 cl hr, 1 cr

The study of dental metallurgy, physical and mechanical properties of metals, their internal structure and types of precious and non-precious dental casting alloys and metals used in the laboratory. Soldering, welding and casting procedures and the associated types of investments and equipment used in these procedures. Polishing agents used for metals is also discussed. Proper handling and safety procedures are discussed. *Prerequisite: RESD 1107*

RESD 2310 Principles of Occlusion

(fall only)

1 cl hr, 3 lab hrs, 2 cr

An introduction to the principles of occlusion (gnathology) including the anatomical structures of the oral cavity, the determinants of occlusal morphology and the physiology of mandibular movements as they relate to the fabrication of dental restorations. Three laboratory exercises in cusp-to-marginal ridge and cusp-to-fossa waxing, using semi-adjustable articulators, are performed. *Prerequisite: RESD 1110*

RESD 2311 Complete Dentures III

(fall only) 1 cl hr, 3 lab hrs, 2 cr

Fabricating an immediate denture, set-up for an immediate full denture, restoring aesthetics, fit and function. The procedures for rebases and surgical trays are also stressed. Removable portion of over denture is designed, constructed and supported by a clip bar substructure. *Prerequisite: RESD 1211*

RESD 2313 Removable Partial Dentures II

(summer or fall)

1 cl hr, 6 lab hrs, 3 cr

Finishing and polishing of metal frameworks, arranging teeth, waxing, flasking, packing, processing, finishing and polishing of acrylic attachments and various repair procedures. *Prerequisite: RESD 1216*

RESD 2314 Restorative Dental Ceramics II

(summer or fall)

1 cl hr, 6 lab hrs, 3 cr

Design and construction of individual metal copings and the design and construction of multiple-unit frameworks, investing and casting of

non-precious metals, pre-soldering and post-soldering of non-precious metals, application and firing of opaques, contouring and firing of porcelains and glazing and staining of individual and multiple-unit bridges and crowns. All ceramic restorations (laminates) will also be emphasized. *Prerequisite: RESD 1215*

RESD 2324 Computer Aided Design/ Computer Aided Manufacturing (CAD/CAM) in Dentistry

1 cl hr, 3 lab hrs, 2 cr

An introduction to the theory and practice of fabricating dental prosthetics digitally. The course will explore Computer Aided Design/Computer Aided Manufacturing systems as it pertains to open and closed architecture, material selection and final dental prosthesis. *Prerequisite: RESD 1212, RESD 1215*

RESD 2409 Laboratory Operation, Ethics and Jurisprudence

(spring only)

2 cl hrs, 2 cr

Legal and ethical obligations of the dental technician under State Dental Practice Acts; the ethical responsibilities of the technician, the dental profession, the public and other dental technicians; and historical aspects of dentistry and dental technology. Fundamentals of laboratory operation and management.

Prerequisite: RESD 1211, RESD 1212, RESD 2307, RESD 2310, RESD 2313, RESD 2314

RESD 2411 Complete Dentures and Maxillofacial Concepts

(spring only)

1 cl hr, 6 lab hrs, 3 cr

A practical application of advanced-level techniques including flexible partial dentures and preliminary maxillofacial techniques which include the fabrication of an obturator denture.

Prerequisite: RESD 1211

RESD 2413 Fixed Prosthodontics Practicum

(spring only)

1 cl hr, 3 lab hrs, 2 cr

A practical application of the techniques and procedures learned in the basic or specialized courses previously studied. Computer-aided design and computer-aided manufacturing (CAD/CAM) of

dental prosthetic restorations will be emphasized. Applications of semi-precision dental attachments for specialized multi-unit bridgework combined with composite restorative materials are included. Actual impressions are used in all restorative dental cases in the classroom.

Prerequisite: RESD 1212

RESD 2414
Restorative Dental Ceramics
Practicum

1 cl hr, 6 lab hrs, 3 cr

A practical application, at an advanced level, of the techniques and procedures learned in the basic or specialized courses previously studied. Actual impressions are used in all restorations. The course also includes fabrication of CAD/CAM PROCERA restorations.

Prerequisite: RESD 2314

RESD 2415
Orthodontics

(spring only)

1 cl hr, 3 lab hrs, 2 cr

History of orthodontics, the types of normal occlusion and malocclusion, the varieties and types of appliances used to move teeth and the physiological actions that occur when teeth are moved through bone as a result of orthodontic treatment.

Prerequisite: RESD 2310

RESD 2416
Dental Implant Prosthetics

1 cl hr, 6 lab hrs, 3 cr

An introduction to the theory and practice of fabricating dental implant prosthetics. The course explores both fixed and removable implant systems that are currently available, as well as fabrication, osseointegration, material selection and final dental prosthesis.

Prerequisites: RESD 2307, RESD 2310, RESD 2314

Vision Care Technology

Professor Kimberly Strickler, Chair
Pearl Building, room P 312
718.260.5298
email: kstrickler@citytech.cuny.edu

PROGRAM:

Ophthalmic Dispensing/AAS

FACULTY:

Professor: Russo
Assistant Professors: Pasner, Strickler, Sollecito

Associate in Applied Science in OPHTHALMIC DISPENSING

The Vision Care Technology Department prepares a student for a career in vision care. Successful completion of the degree qualifies graduates for the New York State licensing examination for ophthalmic dispensers and makes them eligible to take the New York State examination for certification as a contact lens fitter.

The ophthalmic dispenser/optician combines knowledge of scientific and clinical procedures with skills and the ability to work well with patients in the fitting and adapting of lenses and devices that aid in providing comfortable and efficient vision and in correcting ocular deficiencies.

The ophthalmic dispenser measures, adapts and fits eyeglasses to the face and, when further certified as a contact lens fitter, also fits and adapts contact lenses to the eyes for the correction of visual and ocular anomalies. The curriculum in ophthalmic dispensing represents a carefully planned balance of theory and clinical practice in all aspects of the profession.

A graduate of the program may become the proprietor of an ophthalmic dispensing firm or may secure a position as an ophthalmic dispenser, contact lens fitter, an ophthalmic assistant, an ophthalmic sales representative or an optical research technician. Among the employers of the graduates of this program are independent opticians, ophthalmologists, optometrists, HMO's, eye and ear hospitals, wholesale/retail optical establishments and national and international corporations.

Approximate Additional Costs

Malpractice insurance fee	\$15
New York State licensure registration fee	\$108
Ophthalmic Dispensing Practical	\$525
Contact Lens Practical.....	\$150
National licensure fee (ABO.....)	\$225
National licensure fee (NCLE.....)	\$225
Optical tool kit	\$220
All required textbooks (purchased over four semesters).	\$300
Lab coat, department insignia, safety glasses.....	\$60

The College will grant an associate in applied science (AAS) degree in Ophthalmic Dispensing upon satisfactory completion of the required 62 credits listed. All candidates for graduation must be certified as computer literate. In addition, graduates of the program are eligible to pursue a baccalaureate degree in health services administration.

Criteria for Admission into the Vision Care Technology Curriculum

Admission to the College and to the Vision Care Technology program requires a high school diploma or the equivalent. Students who have attended other colleges are welcome to apply as transfer students.

Students who wish to transfer into Vision Care Technology from other curricula within the College or CUNY will be accepted into the program after they have satisfactorily met prerequisite requirements.

After demonstrating CUNY proficiency, students may be admitted to the Vision Care Technology Department as space permits. Transfer students will be accommodated if they are CUNY proficient in mathematics and have a cumulative average of 2.0 or higher, provided there are places remaining in the first semester of the program. If the number of students meeting the stated criteria exceeds the available places in the program, seats will be allocated on the basis of the highest cumulative academic average.

Vision Care Technology Program Outcomes

Students who successfully complete the Vision Care Technology program:

1. Possess the academic, technical and clinical skills to fulfill the duties and responsibilities of an eye care professional/ophthalmic dispenser (optician)
2. Function well in a variety of eye care work environments
3. Communicate clearly in written and oral presentation
4. Understand the ethical responsibilities and implications of one's work and personal actions
5. Apply problem-solving techniques to the workplace
6. Provide ophthalmic dispensing eye care professionals with a broad educational background to protect the health, safety and welfare of the public

Progression in and Graduation from Vision Care Technology

A minimum grade of "C" in each course designated with the prefix VCT will be required for progression in and graduation from the Vision Care Technology program. Special conditions of equipment and faculty availability govern the repeating of vision care technology courses; course repetition will be permitted only after all students meeting the entrance requirements have been allotted seats.

No vision care technology course may be repeated more than once. In addition:

- No more than two vision care technology courses may be repeated during the entire course of study.
- A student may not fail more than one course in any one semester.
- If a student fails to meet any of these provisions, he/she will be required to withdraw from the Vision Care Technology Department.

Additional information is available in the vision care technology student handbook.

GENERAL EDUCATION COMMON CORE ¹		20 CREDITS	PROGRAM-SPECIFIC DEGREE REQUIREMENTS		42 CREDITS)
I – REQUIRED CORE (3 COURSES, 11 CREDITS)					
English Composition (1 or 2 courses, 3 or 6 credits)					
ENG 1101	English Composition I	3	VCT 1101	Ophthalmic Materials and Laboratory I	3
Mathematical and Quantitative Reasoning (1 course, 4 credits)			VCT 1105	Principles of Optics	3
MAT 1275	College Algebra and Trigonometry or higher ²	4	VCT 1201	Ophthalmic Materials and Laboratory II	3
Life and Physical Sciences (1 course, 4 credits)			VCT 1202	Ophthalmic Business Practices	3
BIO 1101	Biology I	4	VCT 1213	Ophthalmic Dispensing I	3
II – FLEXIBLE CORE (3 COURSES, 9 CREDITS)			VCT 1222	Anatomy and Physiology of the Eye	3
Select one course each from three of the following areas		9	VCT 1237	Contact Lenses I	3
World Cultures and Global Issues			VCT 2311	Ophthalmic Materials and Laboratory III	3
US Experience in its Diversity			VCT 2315	Introduction to Principles of Refraction	3
Creative Expression			VCT 2316	Ophthalmic Dispensing Clinic I	1
Individual and Society			VCT 2327	Contact Lenses II	3
Scientific World			VCT 2333	Ophthalmic Dispensing II	3
Writing Intensive Requirement³			VCT 2444	Ophthalmic Dispensing III	3
Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.			VCT 2416	Ophthalmic Dispensing Clinic II	2
			VCT 2427	Contact Lenses III	3
			BIO 1101	Biology I	Met as GenEd
			ENG 1101	English Composition I	Met as GenEd
			MAT 1275	College Algebra and Trigonometry or higher	Met as GenEd
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES					42
TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS					20
TOTAL CREDITS REQUIRED FOR THE DEGREE					62
¹ Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.					
² Students without the requisite math background to enter MAT 1275 will be required to take MAT 1175 in preparation. This will increase the number of required credits for the degree by 4 credits.					
³ A semester-specific list of writing intensive courses is available online at the City Tech Pathways website .					

COURSES:

VCT 1101 Ophthalmic Materials and Laboratory I*

2 cl hrs, 3 lab hrs, 3 cr

An introduction to the didactic and laboratory concepts involved in the identification, location and fabrication of prescription ophthalmic eyewear. Emphasis is placed on single vision physical and optical lens characteristics, physical frame and design characteristics including lens materials, index of refraction, spherical, cylindrical power and axis location. In addition, lens power transposition, lens cross, ophthalmic standards, diopter power formula, focal length, total lens power, relationship of radius of curvature and index of refraction and lens makers equation will be covered. Prerequisite: CUNY proficiency in reading, writing and mathematics;

* Credit by examination available for this course with department approval required

VCT 1105 Principles of Optics I*

3 cl hrs, 3 cr

A study of the basic concepts and principles of light, physical characteristics and geometric properties of optics, rectilinear propagation of light and shadows, reflection of light at planes and spherical surfaces, effect of prism on the transmission and deviation of light and thin lens design theory and application will be covered. Prerequisite: CUNY proficiency in reading, writing and mathematics; * Credit by examination available for this course with department approval required

VCT 1201 Ophthalmic Materials and Laboratory II

2 cl hrs, 3 lab hrs, 3 cr

A continuation of the didactic and laboratory concepts involved in the identification, location and fabrication of prescription ophthalmic eyewear. Emphasis is placed on the calculated effects of prism using a single vision lens power and achieving prism through centration of optical centers. Identifying various ophthalmic lens-manufacturing techniques of factory finish, surfacing and casting methods to achieve lens powers, sphere and toric base curves will be covered. Multifocal lens and progressive lens characteristics are introduced including powers, design, material, lens profiles, lens blank size, frame size and patient PD. In addition, continued application of ophthalmic standards

of ANSI Z80.1, Z80.5 and ANSI Z 87 is emphasized. The laboratory component focuses on the practical aspect of identifying, measuring and fabrication of ophthalmic projects that require wanted prism and fabrication of multifocal lens designs that incorporate patient distant and near PD's.

Prerequisite: VCT 1101

VCT1202 Ophthalmic Business Practices

3 cl hrs, 3 cr

An introduction to ophthalmic business practices including a basic understanding of business management and leadership skills necessary for a successful eye care business.

Prerequisites: VCT 1101, VCT 1105; Corequisites: VCT 1201, VCT 1213

VCT 1213
Ophthalmic Dispensing I

2 cl hrs, 2 lab hrs, 3 cr

This introductory course is designed to develop the student's basic theoretical and hands-on clinical skills in preparation for patient care and service in an operational clinical setting. Topics include lens styles and materials, frame styles and materials, lens treatments, optical measurements, clinical stations and procedural systems, frame repair and adjustment, spectacle verification, patient reception, medical assisting and technical support.

Prerequisites: VCT 1101, VCT 1105;

Corequisites: VCT 1201, VCT 1202

VCT 1222
Anatomy and Physiology of the Eye

3 cl hrs, 3 cr

A study of the structure and function of the eye, bones of the orbit, cranial nerves in the visual system, lid physiology, tear film chemistry, corneal anatomy and function, corneal metabolism, uveal layer, lens accommodation mechanism, retina, photochemistry of vision, visual pathway and extraocular muscles and motility will be covered. In addition, ocular pathologies, anomalies, deficiencies, etiology and treatment, eye examination and ancillary tests for visual screening, eye symptoms and emergencies and ocular pharmacology will be discussed.

Prerequisite: VCT 1101

VCT 1237
Contact Lenses I

2 cl hrs, 3 lab hrs, 3 cr

The history and development of contact lenses, physical characteristics of various types of contact lenses, comparison of contact lens materials, contact lens nomenclature, ANSI specifications, corneal topography and astigmatism will be discussed. The laboratory develops skills in the radiuscope, profile analyzer, diameter and thickness gauges, measuring magnifier, lensometer, lens modifications, slit lamp and keratometry.

Prerequisite: VCT 1101

VCT 2311
Ophthalmic Materials and Laboratory III

2 cl hrs, 3 lab hrs, 3 cr

Advanced didactic and laboratory concepts involved in the selection, identification, location and fabrication of prescription eyewear. Lens aberrations and characteristics based on index of refraction and lens power is covered. Emphasis is placed on special procedures used in the material and fabrication of rimless,

semi-rimless, nylon suspension and drill mounted lenses. In addition, ANSI Z 87.1 safety frames, ASTM F803 sports frames and ASTM F8003 are covered. The laboratory component focuses on the advanced practical aspect of fabrication of lenses and frames, fabrication of rimless, semi-rimless, nylon suspension and drilled mounted lenses. Repairs and customization of frames are also covered.

Prerequisite: VCT 1201, VCT 1213;

Corequisites: VCT 2315, VCT 2316, VCT 2327, VCT 2333

VCT 2315
Introduction to Principles of Refraction

2 cl hrs, 2 lab hrs, 3 cr

An introduction to the study of clinical refraction of the eye. Topics include etiology, types, causes, symptoms, testing and treatment of eye abnormalities; accommodation and presbyopia; versions and vergences; anisometropia and aniseikonia; external examination, preliminary and subjective tests; retinoscopy, low vision aids; twenty-one point refractive examination.

Prerequisite: VCT 1201, VCT 1213, VCT 1222, VCT 1237; *Corequisites:* VCT 2311, VCT 2316, VCT 2327, VCT 2333

VCT 2316
Ophthalmic Dispensing Clinic I

3 cl hrs, 1 cr

An internship course designed to develop the student's clinical ophthalmic dispensing skills. The structure of a basic functioning clinic is detailed. The basic groundwork for patient management and ethical business practice is demonstrated. The students exercise their technical skills with clinical patients under the direct supervision of the clinical instructor. Malpractice insurance is required.

Prerequisites: VCT 1105, VCT 1201, VCT 1202, VCT 1213 VCT 1222, VCT 1237; *Corequisites:* VCT 2311, VCT 2315, VCT 2327, VCT 2333

VCT 2327
Contact Lenses II

2 cl hrs, 3 lab hrs, 3 cr

The study of anatomy, physiology and pathology of the anterior segment of the cornea and related structures, theory of flexible and non-flexible lens fitting, philosophies and optics of contact lenses will be covered. In addition, the theory and fitting of soft lenses and contact lens solutions will be discussed. The laboratory develops skills in keratometry, biomicroscopy illuminations and the fitting of soft lenses. Malpractice insurance is required.

Prerequisites: VCT 1201, VCT 1222, VCT 12131, VCT 1237, BIO 1101; *Corequisites:* VCT 2315, VCT 2316, VCT 2333

VCT 2333
Ophthalmic Dispensing II

2 cl hrs, 3 lab hrs, 3 cr

A study of the origin, ethics, practices and responsibilities of the Ophthalmic Dispenser will be discussed. The development of corrected curves and aspheric design will be detailed. Factors that affect the ophthalmic prescription, such as vertex distance, lens tilting and magnification will be expanded. The design and application of multifocals will be presented. Anatomical and physiological landmarks of the eye will be discussed and the fitting triangle concept will be developed and detailed. The development of the emmetropic eye and a thorough presentation of ametropias will be presented. Measurement of visual acuity will be detailed. An in-depth presentation of both single vision and presbyopic analysis will be covered. The laboratory sessions provide for an application of the theoretical knowledge presented in the lecture. Malpractice insurance is required. *Prerequisites:* VCT 1201, VCT 1202, VCT 1222, VCT 1213, VCT 1237; *Corequisites:* VCT 2311, VCT 2315, VCT 2316, VCT 2327

VCT 2416
Ophthalmic Dispensing Clinic II

4 lab hrs, 2 cr

An internship course designed to increase the basic clinical skills that have been acquired in Ophthalmic Dispensing Clinic I (VCT 2316). Under the supervision of a clinical instructor, the interns operate a full-service ophthalmic dispensing clinic. Malpractice insurance is required. *Prerequisites:* VCT 2311, VCT 2315, VCT 2316, VCT 2327, VCT 2333; *Corequisites:* VCT 2427, VCT 2444

VCT 2427
Contact Lenses III

2 cl hrs, 3 lab hrs, 3 cr

A comparison of spectacles vs. contacts, calculation of residual astigmatism, office procedure and office management and contact lens symptomatology are discussed. Additional topics include: the advanced fitting concepts of RGP lenses, astigmatic contact lenses, scleral lenses, keratoconus, presbyopia, extended wear and disposables, aphakia, therapeutic lenses and pediatric contact lens fitting. The laboratory continues development in the fitting of soft lenses and patient instruction

and follow-up with patients. In addition, rigid lens fitting, insertion and removal techniques, patient instruction, fluorescein pattern evaluation will be covered. Malpractice insurance is required. *Prerequisite:* VCT 2327; *Corequisites:* VCT 2416, VCT 2444

VCT 2444
Ophthalmic Dispensing III

2 cl hrs, 3 lab hrs, 3 cr

A presentation of the licensing requirements and national certifications will be given. Lifestyle dispensing considerations will be detailed with the goal of meeting a patient's eyewear needs. Consideration will be given to analyzing complex prescriptions. The information presented will enable the practitioner to determine proper lens design recommendations for a patient's occupational and avocational needs. Lens extras such as absorptive tints and coatings will be discussed. Cataract surgery and visual correction options will be presented. The New York State Ophthalmic Dispensing Guide to Practice will be detailed and professional liability will be stressed. A detailed section on preparation for state licensing and national certification will be presented. The laboratory sessions provide for an application of the theoretical knowledge presented in the lecture. The sessions equip the student with the skills necessary at the dispensing table with the patient. Malpractice insurance is required. *Prerequisites:* VCT 2311, VCT 2315, VCT 2316, VCT 2327, VCT 2333; *Corequisites:* VCT 2416, VCT 2427

SCHOOL OF TECHNOLOGY AND DESIGN

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Louis Stokes Alliance for Minority Participation (LSAMP) Coordinator
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Departments:

Architectural Technology
Computer Engineering Technology
Construction Management and Civil Engineering Technology
Entertainment Technology

Communication Design (formerly Advertising Design and Graphic Arts)
Computer Systems Technology
Electrical and Telecommunications Engineering Technology
Environmental Control Technology Mechanical Engineering Technology

Degree Programs:

Bachelor of Technology (BTech)

Architectural Technology
Computer Systems
Emerging Media Technology
Mechanical Engineering Technology

Communication Design
Construction Engineering Technology
Entertainment Technology
Telecommunication Engineering Technology

Computer Engineering Technology
Electrical Technology
Facilities Management

Associate in Applied Science (AAS)

Architectural Technology
Computer Information Systems
Electromechanical Engineering Technology
Mechanical Engineering Technology

Civil Engineering Technology
Construction Management Technology
Environmental Control Technology
Microcomputer Business Systems

Communication Design
Electrical Engineering Technology
Industrial Design Technology
Telecommunication Engineering Technology

Certificate Programs:

Construction Management

Mission

The School of Technology and Design helps to builds bridges from computer-based tools for design and modeling to real-world materials and production processes. The school is home to a unique combination of programs including graphic communications and digital media, architecture and computer-aided design, live entertainment and interactive event technology, computing software, networking, security and data management, electronic systems, optical and wireless telecommunications, robotics and automation and construction and building systems. Faculty members represent a broad range of technology expertise, from basic hardware and software to systems integration for design and production. Graduates from the School of Technology and Design are prepared for positions in industry, and many obtain further degrees and professional licenses. Students benefit from close relationships among topics, tools and curriculum modules coordinated across departments. In addition to opportunities for professional internships and faculty-advised research projects, students may take coursework in secondary areas of study to complement their major with interdisciplinary experiences.

Architectural Technology

Professor Sanjive Vaidya, Interim Chair
Voorhees Hall, room V 818
718.260.5262
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PROGRAMS:

Architectural Technology/AAS
Architectural Technology/BTech

FACULTY:

Professors: Maldonado
Associate Professors: Azaroff, Bouratoglou, Dikigoropoulou, Edwards, King, Leonhardt, Smith, Zagaroli
Assistant Professors: Anzalone, Aptekar, Beita, Chin, Conzelmann, Duddy, Hernandez, Kim, Mishara, Montgomery, Vaidya

CLTs: Baez, Joseph

Associate in Applied Science in ARCHITECTURAL TECHNOLOGY

The associate in applied science in Architectural Technology, the only program of its kind in the CUNY system, educates students to assist the architect and perform at a high level in design, contract documents and the construction stages of a building project. The program familiarizes students with up-to-date architectural office practices and procedures including current digital tools for design, analysis, representation, and fabrication. Studio work gives the students the opportunity to develop their talents by participating in various architectural projects from inception to final presentation.

The two-year AAS degree is offered as the first half of the four-year bachelor of technology (BTech) degree program. Students enrolled in the AAS degree in Architectural Technology may transfer directly into the bachelor of technology degree program at any time upon meeting the requirements or upon completion of the AAS degree. Upon completion of 64 credits, students generally have the credentials to begin a career in an architect's or engineer's office. This provides the flexibility of working in the field while completing the baccalaureate degree during the day or evening sessions.

A partial listing of positions that graduates of this program will qualify for includes architectural technician, CAD drafter, architectural renderer, architectural model maker, fabrication shop technician, manufacturer's representative, building department expeditor, assistant building performance analysis technician, assistant specifications writer and clerk of the works. Employers of the graduates of these programs have included Davis/Brody Architects, The Dormitory Authority of the State of New York, Gwathmey Siegel, HOK, Skidmore Owings & Merrill, Michael Lynn Associates, The Metropolitan Museum of Art, New York City Department of Parks, Robert A.M. Stern Architects, U.S. Government Corps of Engineers, Walker Group, Peter Brooks Associates (England), Heier & Monse Architects (Germany) and Christian Moreau Architects (France).

Program Educational Objectives

The objectives of the associate in applied science degree in Architectural Technology are:

- To transfer basic building blocks of knowledge to create pathways for life-long learning and meaningful employment in architecture and related fields.
- To foster a community of supportive, engaged professionals who excel in the core skills of architecture from whom the students will learn, discuss and debate the changing needs of the field.
- To direct the student toward advanced and new methods of problem solving which incorporates deep inquiry of relevant topics, academic research, consideration of the sustainable environment and visualization of successful solutions.

Program Learning Outcomes

1. Graduates from the AAS degree program are prepared for entry-level employment in the architectural field, having a breadth of knowledge in topics including construction documents, computer applications, design and programmatic planning, architectural history, and environmental systems.
2. The AAS degree graduate is well versed in visual and written presentation, critical thinking and methods of effective communication at different levels as well as a basic broad understanding of history, math, science and the humanities.
3. AAS degree graduates are uniquely qualified to bridge the span between the technological and pragmatic needs of the architectural related fields in a way which incorporates a variety of approaches and draws upon a diverse understanding of methods employed to solve problems and serve client needs.

Progression in and Graduation from Architectural Technology

For progression in and graduation from this Architectural Technology program, a minimum grade of "C" is required in the following courses in the major: all required Design Studios (ARCH 1112, ARCH 1212, ARCH 2312, and ARCH 2412) and Building Technology courses (ARCH 1131, ARCH 1231, ARCH 2331, ARCH 2431).

Additional Costs other than Tuition and College-wide Fees (Approximate):

Textbooks	\$400
Professional Tools	\$300
Project Materials and Supplies	\$200
Portfolio Preparation	\$100

GENERAL EDUCATION COMMON CORE ¹

20-21 CREDITS

I – REQUIRED CORE (3 COURSES, 11-12 CREDITS)

English Composition (1 course, 3 credits)

ENG 1101	English Composition I	3
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Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1275 or higher ²	College Algebra and Trigonometry	4
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Life and Physical Sciences (1 course, 4-5 credits)

PHYS 1433	General Physics I: Algebra Based	4
PHYS 1441	General Physics I: Calculus Based	5

II – FLEXIBLE CORE (3 COURSES, 9 CREDITS)

In addition to the required course listed below, select one course from two of the other four areas; no more than two courses may be selected from any discipline.

6

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Individual and Society

Any Approved Course

Creative Expression

ARCH 2321/
ARTH 2321 History of Architecture 1900 to the Present

3

Scientific World

Any Approved Course

Writing Intensive Requirement³

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS**44 CREDITS**

ARCH 1101	Introduction to Architecture	2
ARCH 1112	Architectural Design I: Foundations and Visual Studies	5
ARCH 1121	History of World Architecture to 1900 Technology	2
ARCH 1212	Architectural Design II: Foundations and Visual Studies	5
ARCH 1231	Building Technology I	3
ARCH 1250	Site Planning	2
ARCH 2312	Architectural Design III	5
ARCH 2321	History of Architecture 1900 to the Present	Met as GenEd
ARCH 2331	Building Technology II	3
ARCH 2381	Structures I	2
ARCH 2412	Architectural Design IV	5
ARCH 2431	Building Technology III	4
ARCH 2481	Structures II	3
ENG 1101	English Composition I	Met as GenEd
MAT 1275		
or higher	College Algebra and Trigonometry	Met as GenEd
PHYS 1433	General Physics I: Algebra Based	
or		
PHYS 1441	General Physics I: Calculus Based	Met as GenEd

ELECTIVES (CHOOSE ONE)

ARCH 3550	Building Performance Workshop	3
ARCH 3551	Sustainability: History and Practice	3
ARCH 3570	Lighting and Acoustics	3
ARCH 3590	Parametric Computation,	

Materials and Fabrication**3**

ARCH 3591	Computer-Assisted Architectural Animation	3
ARCH 3609	Integrated Software in the Architectural Office	3
ARCH 3631	Advanced Material Workshop	3
ARCH 3640	Historic Preservation Theory and Practice	3
ARCH 3662	Government Regulations and Approvals	3
ARCH 3690	Intermediate Computation and Fabrication	3
ARCH 3691	Advanced Design and Building Information Modeling	3
ARCH 3900	Study Abroad	3
ARCH 4709	Advanced 3D Modeling and Rendering	3
ARCH 4740	Detail and Construction of Existing Buildings	3
ARCH 4780	Case Studies in Structural Engineering	3
ARCH 4791	Advanced Building Information Modeling and Integrated Project Delivery	3
ARCH 4831	Design to Build	3
ARCH 4890	Computation and Fabrication	3
	Performative Architecture	3
ARCH 4900	Internship in Architectural Technology	3

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES**44****TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS****20-21****TOTAL CREDITS REQUIRED FOR THE DEGREE****64-65**

¹ Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.

² Students without the requisite math background to enter MAT 1275 will be required to take MAT 1175 in preparation. This will increase the number of required credits for the degree by 4 credits.

³ A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

For progression in and graduation from this Architectural Technology program, a minimum grade of "C" is required in the following courses in the major: all required Design Studios (ARCH 1112, ARCH 1212, ARCH 2312, and ARCH 2412) and Building Technology courses (ARCH 1231, ARCH 2331, ARCH 2431).

Curriculum by Semester

For students earning an associate in applied science (AAS) degree with a major in Architectural Technology.

FIRST SEMESTER**CREDITS**

ARCH 1112	Architectural Design I: Foundations and Visual Studies	5
ARCH 1101	Introduction to Architecture	2
ENG 1101	English Composition I	3
MAT 1275 ¹	College Algebra and Trigonometry	4
Subtotal		14

SECOND SEMESTER

ARCH 1121	History of World Architecture to 1900	2
ARCH 1212	Architectural Design II: Foundations & Visual Studies	5
ARCH 1231	Building Technology II	3
ARCH 1250	Site Planning	2
PHYS 1433	General Physics I: Algebra Based	
or		
PHYS 1441	General Physics I: Calculus Based	4-5
Subtotal		16-17

THIRD SEMESTER

ARCH 2312	Architectural Design III	5
ARCH 2331	Building Technology III	3
ARCH 2321	History of Architecture 1900 to the Present	3
ARCH 2381	Structures I	2
GenEd Elective	FLEXIBLE CORE	3

Subtotal **16**

FOURTH SEMESTER

ARCH 2412	Architectural Design IV	5
ARCH 2431	Building Technology III	4
ARCH 2481	Structures II	3
GenEd Elective	FLEXIBLE CORE	3
CAPSTONE	AAS Elective (choose one)	3

Subtotal **18**

TOTAL CREDITS REQUIRED FOR THE DEGREE **64-65**

1 Or higher-level Mathematics course.

- To instill a command of the tools necessary for architectural technicians including the ability to master techniques, utilize 21st-century technology, work in multidisciplinary teams and effectively communicate in written and graphic forms.

Program Learning Outcomes

1. Bachelor's degree graduates can demonstrate mastery of pragmatic and conceptual solutions to modern-day design problems in areas related to architecture.
2. Students in this program have greater opportunities in employment and in advanced education at the graduate level as a result of the base knowledge gained at City Tech.
3. Successful graduates develop their own inherent approach to design, professional ethics, impact upon the built environment and the role of the architect in society.

Progression in and Graduation from Architectural Technology

For progression in and graduation from this Architectural Technology program, a minimum grade of "C" is required in the following courses in the major: all required Design Studios (ARCH 1112, ARCH 1212, ARCH 2312, ARCH 2412, ARCH 3510, ARCH 3610, ARCH 3630, ARCH 4710, ARCH 4810 and ARCH 4830) and Building Technology courses (ARCH 1231, ARCH 2331, ARCH 2431).

Additional Costs other than Tuition and College-wide

Fees for the Baccalaureate Degree Program (Approximate):

Textbooks and Periodicals	\$500
Professional Tools and Dues	\$300
Project Materials and Supplies	\$400
Portfolio Preparation.....	\$200

Bachelor of Technology in ARCHITECTURAL TECHNOLOGY

The Department of Architectural Technology offers a unique four-year BTech that prepares the student to be proficient in the 21st century technologies required to manage all phases of professional practice in architecture and related fields: design, construction materials and assemblies, architectural history, mechanical and structural systems, building information modeling (BIM), codes and professional practice, site planning, building performance analysis and sustainable design, and digital fabrication and manufacturing.

Our design and building technology studios give students an opportunity to develop their own ideas and creative talents through participation in architectural projects from inception to final presentation and fabrication. Graduates from our BTech degree program are well equipped to be a part of an architectural design team in a broad range of planning and construction coordination roles.

They are provided with immediately marketable skills and a solid foundation for career advancement. Many graduates of this program go on to apply for a master's degree in architecture (MArch), but BTech graduates can also qualify for the architectural registration exams and New York State licensure following a period of work under a licensed architect and completion of the Intern Development Program of the National Council of Architectural Registration Boards.

Note: As of Fall 2017, the Architecture Department is eligible for candidacy for a proposed Bachelor of Architecture (BArch) degree by the National Architectural Accrediting Board (NAAB). The NAAB grants candidacy status to new programs that have developed viable plans for achieving initial accreditation. Candidacy status indicates that a program has created a plan to achieve initial accreditation within six years. The NAAB visit to establish candidacy status is expected Spring 2018; if successful, projected year of initial BArch accreditation is 2023.

Program Educational Objectives

The objectives of the bachelor of technology in Architectural Technology are:

- To provide students with skills necessary to think critically and learn continually for professional success in design and construction-related fields.

GENERAL EDUCATION COMMON CORE

44-45 CREDITS

I – REQUIRED CORE (4 COURSES, 14-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101*	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1275 or higher *.1	College Algebra and Trigonometry	4
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Life and Physical Sciences (1 course, 4-5 credits)

PHYS 1433*	General Physics I: Algebra Based	4
PHYS 1441*	General Physics I: Calculus Based	5

II – FLEXIBLE CORE

(6 COURSES, 18 CREDITS; 9 CREDITS MET FOR ASSOCIATE DEGREE)

In addition to the required courses listed below, select one course from each of the following three areas, plus one additional course from any of the five areas; no more than two courses may be selected from any discipline.

World Cultures and Global Issues

Any Approved Course	3
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US Experience in its Diversity

ARCH 3522	A History of New York City Architecture	3
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Individual and Society

Any Approved Course	3
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Creative Expression

ARCH 2321/ ARTH 2321*	Architectural History 1900 to the Present	3
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Scientific World

Any Approved Course	3
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One Additional Course from Any Group

Any approved course	3
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III – COLLEGE OPTION REQUIREMENTS² (UP TO 12 CREDITS)

- One course in Speech/Oral Communication³
Any Approved Course 3
- One interdisciplinary Liberal Arts and Sciences course
Any Approved Course 3
- Additional liberal arts credits to reach a minimum of 42 credits in general education.
In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language.

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 78 CREDITS**ASSOCIATE-LEVEL COURSES**

ARCH 1101	Introduction to Architecture	2
ARCH 1112	Architectural Design I: Foundations and Visual Studies	5
ARCH 1121	History of World Architecture to 1900 Technology	2
ARCH 1212	Architectural Design II: Foundations and Visual Studies	5
ARCH 1231	Building Technology I	3
ARCH 1250	Site Planning	2
ARCH 2312	Architectural Design III	5
ARCH 2321	History of Architecture 1900 to the Present	Met as GenEd
ARCH 2331	Building Technology II	3
ARCH 2381	Structures I	2
ARCH 2412	Architectural Design IV	5
ARCH 2431	Building Technology III	4
ARCH 2481	Structures II	3
ENG 1101	English Composition I	Met as GenEd
MAT 1275 or higher	College Algebra and Trigonometry	Met as GenEd
PHYS 1433 or	General Physics I: Algebra Based	
PHYS 1441	General Physics I: Calculus Based	Met as GenEd

ELECTIVES (CHOOSE ONE)

ARCH 3550	Building Performance Workshop	3
ARCH 3551	Sustainability: History and Practice	3
ARCH 3570	Lighting and Acoustics	3
ARCH 3590	Parametric Computation,	

Materials and Fabrication**3**

ARCH 3591	Computer-Assisted Architectural Animation	3
ARCH 3609	Integrated Software in the Architectural Office	3
ARCH 3631	Advanced Material Workshop	3
ARCH 3640	Historic Preservation Theory and Practice	3
ARCH 3662	Government Regulations and Approvals	3
ARCH 3690	Intermediate Computation and Fabrication	3
ARCH 3691	Advanced Design and Building Information Modeling	3
ARCH 3900	Study Abroad	3
ARCH 4709	Advanced 3D Modeling and Rendering	3
ARCH 4740	Detail and Construction of Existing Buildings	3
ARCH 4780	Case Studies in Structural Engineering	3
ARCH 4791	Advanced Building Information Modeling and Integrated Project Delivery	3
ARCH 4831	Design to Build	3
ARCH 4890	Computation and Fabrication Performative Architecture	3
ARCH 4900	Internship in Architectural Technology	3

BACCALAUREATE-LEVEL COURSES**REQUIRED COURSES (28-31 CREDITS)**

ARCH 2370	Building Systems	3
ARCH 3510	Architectural Design V	4
ARCH 3522	History of New York City Architecture	Met as GenEd / BTech Elective
ARCH 3531	Building Technology IV	3
ARCH 3610	Architectural Design VI: Advanced Design or	
ARCH 3630	Advanced Detailing Studio	5
ARCH 4710	Architectural Design VII: Urban Design	5
ARCH 4740 ⁴	Detail and Construction Technologies for Existing Buildings	3
ARCH 4810	Architectural Design VIII: Special Topics or	
ARCH 4830	Construction Technology: Special Topics	5
ARCH 4861	Professional Practice	3

ELECTIVE COURSES IN THE MAJOR⁵ (3-6 CREDITS)

ARCH 3550	Building Performance Workshop	3
ARCH 3551	Sustainability: History and Practice	3
ARCH 3570	Lighting and Acoustics in Architecture	3
ARCH 3590	Parametric Computation, Materials and Fabrication	3
ARCH 3591	Computer Assisted Architectural Animation	3
ARCH 3609	Integrated Software in the Architectural Office	3
ARCH 3631	Advanced Materials Workshop	3
ARCH 3640	Historic Preservation: Theory and Practice	3
ARCH 3662	Government Regulations and Approvals	3
ARCH 3690	Intermediate Computation and Fabrication	3
ARCH 3691	Advanced Design and Building Information Modeling	3

ARCH 3900	Study Abroad	3
ARCH 4400	Special Topics in Architecture	3
ARCH 4709	Advanced 3-Dimensional Modeling and Rendering	3
ARCH 4740	Detail and Construction Technologies for Existing Buildings	3
ARCH 4750	Advanced Simulation for High Performance Buildings	3
ARCH 4780	Case Studies in Structural Engineering	3
ARCH 4791	Advanced Design and Building Information Modeling and Integrated Project Delivery	3
ARCH 4831	Design to Build	3
ARCH 4890	Computation and Fabrication: Performative Architecture	3
ARCH 4900	Internship in Architectural Technology	3
FMGT 3620	Building Systems I	3
FMGT 4720	Building Systems II	3
FMGT 4780	Programming and Introduction to Space Planning	3
MAT 1475	Calculus I	4
Students may use the following upper-level studios for elective credit with department approval:		
ARCH 3610	Design VI	5
ARCH 3630	Advanced Detailing	5
ARCH 4810	Design VIII	5
ARCH 4830	Construction Technology: Special Topics	5
Students may select one elective course outside the major to replace a BTech elective, with department approval		
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES		78
TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS		42
TOTAL CREDITS REQUIRED FOR THE DEGREE		120
* Courses required for associate degree.		
1 Students without the requisite math background to enter MAT 1375 will be required to take MAT 1175, and/or MAT 1275 in preparation. This will increase the number of required credits for the degree by 4-8 credits.		
2 Complete lists of liberal arts and sciences courses and advanced liberal arts courses, as well as semester-specific lists of interdisciplinary courses and writing intensive courses, are available online at the City Tech Pathways website .		
3 Students who have already taken COM 1330 or higher may take another liberal arts course instead.		
4 ARCH 4740 is not required for students who take ARCH 3630.		
5 Students may potentially substitute one course from outside the department for an elective class. Consultation with and approval of a faculty advisor is required.		
For progression in and graduation from this Architectural Technology program, a minimum grade of "C" is required in the following courses in the major: all required Design and Construction Technology Studios (ARCH 1112, ARCH 1212, ARCH 2312, ARCH 2412, ARCH 3510, ARCH 3610, ARCH 3630, ARCH 4710, ARCH 4810 and ARCH 4830), and all required Visual Studies (ARCH 1191, ARCH 1291) and Building Technology courses (ARCH 1231, ARCH 2331, ARCH 2431).		
Students may not enroll in multiple studios concurrently, i.e. students may enroll in only one course per semester from the following list: ARCH 3610, ARCH 3630, ARCH 4710, ARCH 4810, ARCH 4830.		

Curriculum by Semester

For students earning a bachelor of technology (BTech) degree in Architectural Technology.

FIFTH SEMESTER		CREDITS
ARCH 3510	Architectural Design V	4
ARCH 3522	A History of New York City Architecture	3
ARCH 3531	Building Technology IV	3
ENG 1121	English Composition II	3
MAJOR ELECTIVE	BTech Elective	3
Subtotal		16
SIXTH SEMESTER		
ARCH 2370	Building Systems	3
ARCH 3610	Architectural Design VI	
ARCH 3630	Advanced Detailing Studio	5
GenEd Elective	FLEXIBLE CORE	3
COLLEGE OPTION	One course in Speech/Oral Communication COM 1330 Public Speaking or higher	3
(ARCH 4740	Detail and Construction Technologies for Existing Buildings required for students who take Arch 3610 other students may select an additional BTech elective	3)
Subtotal		14-17
SEVENTH SEMESTER		
ARCH 4710	Architectural Design VII: Urban Design	5
MAJOR ELECTIVE	BTech elective	3
COLLEGE OPTION	One Interdisciplinary Liberal Arts and Science course	3-4
GenEd Elective	FLEXIBLE CORE	3
Subtotal		14-15
EIGHTH SEMESTER		
ARCH 4861	Professional Practice	3
ARCH 4810	Architectural Design VIII: Special Topics	
ARCH 4830	Construction Technology: Special Topics	5
COLLEGE OPTION	Advanced Liberal Arts course	3
Additional Liberal Arts (if needed to reach 42 credits in liberal arts)		3
Subtotal		11-14
TOTAL CREDITS REQUIRED FOR THE DEGREE		MIN. 120

COURSES:

ARCH 1101 Introduction to Architecture

4 lab hrs, 2 cr

Understanding architecture is achieved by developing a visual literacy of New York City's built environment. Using the city as a living laboratory, students explore concepts of design, composition, and construction by sketching and writing about their direct experience of buildings. Focus workshops on freehand drawing techniques, basic drafting skills, graphic standards, 2D and 3D composition, writing about buildings and their construction, and reading architectural drawings are central to this course. Students develop graphic skills and the basic foundation to talk, write and graphically express architecture and its construction.

ARCH 1110 Architectural Design I: Foundations

0 cl hrs, 6 lab Hours, 3 cr

The first course in the one-year design foundation sequence, which increases the student's ability to perceive visual cues, create visual design, formulate concepts, and render ideas in two or three dimensions. Students will use a combination of hand and digital skills to aid in the creation and interpretation of three dimensional objects and space, and the delineation of the same using standard projection systems.

Corequisite: ARCH 1191

ARCH 1112 Architectural Design I: Foundations and Visual Studies

1 cl hrs, 8 lab Hours, 5 cr

A first-year foundational course that increases students' ability to perceive visual cues, create visual design, formulate concepts, and render ideas in two or three dimensions. Students use a combination of hand and digital skills to aid in the creation and interpretation of three dimensional objects and space, and the delineation of the same using standard projection systems. The Visual Studies component of the course equips students to make aesthetic evaluations and translate information into graphic representations and visual designs.

Pre- or corequisite: ARCH 1101

Equivalent to ARCH 1110 + ARCH 1191

ARCH 1121 History of World Architecture to 1900

1 cl hr, 2 lab hrs, 2 cr

An historical survey of architecture from early civilizations to the start of

the Industrial Revolution. Architecture is examined as an expression of the culture and life of a society. Class sessions study architecture from around the world within its social, temporal, and spatial contexts. While the history of Western architecture is covered from ancient Egypt to the Enlightenment, a special focus is directed to the architectures of the Far East, South Asia, Africa, pre-Columbian Latin America, the Islamic World, and elsewhere to provide a comprehensive overview of the richness and diversity of architecture as a cultural artifact.

Prerequisite: ENG 1101

ARCH 1191 Visual Studies I

1 cl hr, 2 lab hrs, 2 cr

An introduction to the language of architectural representation and visualization, providing students with the techniques and skills to perceive visual cues, make aesthetic evaluations, translate information into graphic representation, create visual design, formulate concepts, and render ideas in two or three dimensions. This course provides the tools for students in their design work by strengthening their skills visually, verbally, and graphically so they may demonstrate their fluency in and understanding of key design vocabulary, concepts, and visual techniques.

Corequisite: ARCH 1112

ARCH 1210 Architectural Design II: Foundations

0 cl hrs, 6 lab hrs, 3 cr

The second course in the one-year design foundation sequence, which increases the student's ability to perceive visual cues, create visual design, formulate concepts, and render ideas in two or three dimensions. Students will use a combination of hand and digital skills to aid in the creation and interpretation of three dimensional objects and space, and the delineation of the same using standard projection systems.

Prerequisites: ARCH 1110, ARCH 1191, both with a grade of C or higher;

Corequisite: ARCH 1291

ARCH 1212 Architectural Design II: Foundations and Visual Studies

1 cl hrs, 8 lab hrs, 5 cr

A first-year foundational course that advances students' ability to perceive visual cues, create visual design, formulate concepts and render ideas in two or three dimensions.

Students use a combination of hand and digital skills to aid in the creation and interpretation of three dimensional objects and space, and the delineation of the same using standard projection systems. The Visual Studies component of the course builds on the student's knowledge of architectural representation and visualization and focuses particularly on: precise crafting of physical and analogue models, architectural presentations, analogue and digital rendering techniques.

Prerequisites: ARCH 1101 and (ARCH 1112 with a grade of C or higher OR (ARCH 1110 and ARCH 1191 with a grade of C or higher)); Pre—or corequisite: MAT 1275 or higher

Equivalent to ARCH 1210 + ARCH 1291

ARCH 1231 Building Technology I

1 cl hr, 4 lab hrs, 3 cr

An introduction to basic materials of construction and the fundamental principles of architectural hand drafting and system analysis. The coursework includes surveying existing conditions, development of drawings of plans, elevations, sections, and basic details as well as the study of material properties and applications.

Prerequisites: CUNY Proficiency in Reading and Mathematics or for high school students enrolled through collaborative programs or City Poly High School who have not yet taken the SAT or completed Regents requirements; in Reading, a PSAT score of 48 or higher in Verbal and/or Writing or successful completion of six units of high school English with an average of 80 or above and high school recommendation; and in Mathematics, a PSAT score of 50 or higher in Mathematics or a 75 or above on the math Regents exam and the successful completion of 4 units of high school algebra and geometry with an 80 or above average.

Equivalent to old course ARCH 1130

ARCH 1250 Site Planning

1 cl hr, 2 lab hrs, 2 cr

The application of the fundamental techniques of site planning principles and the use of topographical maps and models. This course will explore the importance of site development as it relates to architecture and sustainable site development. Graphic and model presentation skills are required.

Prerequisite: ARCH 1101; Pre- or corequisites: MAT 1275 or higher

ARCH 1291 Visual Studies II

1 cl hr, 2 lab hrs, 2 cr

This course introduces the language of architectural representation and visualization, providing students with the techniques and skills to perceive visual cues, make aesthetic evaluations, translate information into graphic representation, create visual design, formulate concepts, and render ideas in two or three dimensions. This course provides the tools for students in their design work by strengthening their skills visually, verbally, and graphically so they may demonstrate their fluency in and understanding of key design vocabulary, concepts, and visual techniques.

Prerequisites: ARCH 1110, ARCH 1191, both with a grade of C or higher;

Corequisite: ARCH 1210

ARCH 2205ID/LIB 2205ID Learning Places: Understanding the City

1 cl hr, 4 lab hrs, 3 cr

This special topics course offers an interdisciplinary approach to investigating our built environment using a case study focused on a specific place each semester. This course combines physical examination with information research and data collection using methodologies developed in multiple disciplines. Students from a variety of departments engage in on-site exploration and in-depth research of a location in New York City.

Prerequisite: ENG 1101

ARCH 2312 Architectural Design III

1 cl hr, 8 lab hrs, 5 cr

An exploration of abstract architectural design theory in the expression of three-dimensional space. The creation of comprehensive architectural design projects are developed following a building program and incorporating elements of site, enclosure, structure, material and technology. Design concepts and vocabulary are introduced and strengthened through design projects. A juried presentation will take place at the completion of each project.

Prerequisite: (ARCH 1212 with a grade of C or higher) or (ARCH 1210 and ARCH 1291, both with a grade of C or higher); Pre- or corequisite: ARCH 1250

ARCH 2321/ARTH 2321 History of Architecture: 1900 to the Present

Pathways: Creative Expression

3 cl hrs, 3 cr

A comprehensive study of modern architectural movements from the 1900's to present day. Architects

and their buildings will be explored in relationship to their cultural, artistic, philosophical, historical and technological contexts.

Prerequisites: ENG 1101; and one of the following ARCH 1121 or ARTH 1101 or ARTH 1102 or ARTH 1103 or ARTH 1104

ARCH 2331 Building Technology II

1 cl hr, 4 lab hrs, 3 cr

A study of the basic materials of construction as well as the theory and practice of building technology. The course will include investigation of the assembly of building components and methods of construction while developing proficiency in both analog and digital drawing techniques, and professional level construction drawing.

Prerequisite: ARCH 1130 with a grade of C or higher or ARCH 1231 with a grade of C or higher; Pre- or corequisites: ARCH 1112 and MAT 1275 or higher

Equivalent to old course ARCH 1230

ARCH 2370 Building Systems

3 cl hrs, 3 cr

A survey of systems employed in buildings including plumbing, electrical, heating, ventilation, air conditioning and fire alarm and suppression. System components, design, application, equipment locations and distribution will be examined. Sustainability and energy efficiency applications will be addressed and digital software used for data analysis.

Prerequisites: ARCH 1230 with a grade of C or higher

ARCH 2381 Structures I

1 cl hrs, 2 lab hrs, 2 cr

The analysis of basic physical and geometric laws relating to architectural elements and materials, including principles and understanding related to the mathematical treatment of equilibrium in static structures and strength of materials.

Prerequisite: ENG 1101; Pre- or corequisite: MATH 1275 or higher, PHYS 1433 or higher

ARCH 2412 Architectural Design IV

1 cl hr, 8 lab hrs, 5 cr

This studio is an introduction to architectural design emphasizing concept development throughout the design process to a final spatial experience. Research and analysis, program development, flow diagrams and massing studies will be used to further develop the student's concepts into their final projects. A juried

presentation will take place at the completion of each project.

Prerequisite: ARCH 1250 and (ARCH 2310 or ARCH 2312 with a grade of C or higher) and (ARCH 1291 or ARCH 1212 with a grade of C or higher); Pre- or corequisite: (ARCH 2321) and (ARCH 1230 with a grade of C or higher if it is taken as a prerequisite or ARCH 2331 with a grade of C or higher if it is taken as a prerequisite)

ARCH 2431 Building Technology III

1 cl hr, 6 lab hrs, 4 cr

The course is a continuation of the building technology sequence and introduces the student to building renovation. Using digital technologies, the student analyzes factors, such as codes and government regulations, human ergonomics, and sustainability which affect building use and construction and creates a set of working drawings and series of reports. Building information modeling (BIM) techniques and tools are utilized in this course. *Prerequisite:* MAT 1275 and (ARCH 1230 with a grade of C or higher or ARCH 2331 with a grade of C or higher)

ARCH 2481 Structures II

3 cl hrs, 3 cr

The analysis and design of architectural structures and their materials. Emphasis is placed on the theoretical and practical study and application of wood, steel concrete structures using basic physical laws. The behavior of these various elements under stress, and the proper selection of each, will be discussed..

Prerequisites: (ARCH 2480 or ARCH 2381), MATH 1275 or higher, PHYS 1433 or higher

ARCH 3510 Architectural Design V

1 cl hr, 6 lab hrs, 4 cr

This studio focuses on the design development and detailing of both a commercial and a residential project. The studio addresses the next level of design after schematic design: design development. This includes the integration of structure, mechanical, lighting, plumbing fixture selection, interior materials, finishes, space programming and furniture layout. Students are required to meet current design and functional needs of the design problem's program as well as code requirements.

Prerequisite: ARCH 2412 or ARCH 2410) with a grade of C or higher or an AAS degree in an architecturally-related field and (ARCH 1291 or ARCH 1212) with a grade of C or higher

ARCH 3522 A History of New York City Architecture

**Pathways: US Experience
in Its Diversity**

3 cl hrs, 3 cr

A historical analysis of the city's infrastructure, real estate development, municipal planning, ordinances and key buildings using the comparative method. The class will trace the course of architectural history from the village to the present role of the city as the commercial and cultural hub of the nation. This course will stress the dynamic socio-economic determinants emerging as a result of improvements and growth in technology, transportation, infrastructure, real estate, commerce, housing and recreation.

Prerequisite: ENG 1101; and one of the following: ARCH 1121 or ARTH 1101 or ARTH 1102 or ARTH 1103 or ARTH 1104

ARCH 3531 Building Technology IV

1 cl hr, 4 lab hrs, 3 cr

The final course in a four-part sequence. Using digital technologies, the student explores the mechanics of building enclosures and structures and creates a set of working drawings. Emphasis is on communication and collaboration skills necessary in the professional office. Building information modeling (BIM) techniques and tools emphasized in this course.

Prerequisite: (ARCH 2431 with a grade of C or higher) or (ARCH 2330 with a grade of C or higher)

ARCH 3550 Building Performance Workshop

1 cl hr, 4 lab hrs, 3 cr

Review of the fundamentals of sustainability in architecture. The course fosters the students' understanding of climate change resulting from current waste, water, and energy practices, and introduces them to innovative building materials, systems and technologies to mitigate this change. The course introduces the criteria and the technological tools by which green buildings are measured, assessed, and funded.

Prerequisites: (ARCH 1250 and ARCH 2370) or (CMCE 1222 and CMCE 2320)

ARCH 3551 Sustainability: History and Practice

3 cl hrs, 0 lab hrs, 3 cr

Sustainability describes an approach to the design, construction and stewardship of products and environments that align human need and ecological resourcefulness.

This course focuses on built work of the last 200 years that grew from a new consciousness of ecological limits, living system dynamics and understanding of human well-being. The practice of sustainability has developed numerous and sometimes competing logics. This course explores how sustainable criteria are influenced by outlook (and self-interest) and how the prioritization of health, social agendas, economics, aesthetics, environmental protection or resource efficiency have shaped selected buildings, landscapes and city plans.

Prerequisites: ENG 1101, completion of 45 credits

ARCH 3570 Lighting and Acoustics in Architecture

3 cl hrs, 0 lab hrs, 3 cr

A general study and survey of the roles that lighting and acoustics play in the design of buildings. Areas of study include day lighting and artificial lighting of spaces, and sound transfer and control in interior and exterior spaces. Lighting system components, design, application and equipment are examined along with the design of spaces to provide desirable room acoustics. The application of computer software for lighting and acoustical investigation and design of spaces is also examined. The second and final course offered in Architectural Environmental Systems sequence.

Prerequisites: ARCH 2370, ARCH 2430

ARCH 3590 Parametric Computation, Materials and Fabrication

1 cl hr, 4 lab hrs, 3 cr

An introduction to digital fabrication. In the context of computational design and digital fabrication thinking and techniques, the course will explore the qualities of materials such as wood, concrete, and plastics. Projects will provide students with experience in the use of a variety of tools, equipment, key concepts, and emerging digitally-driven technologies, including parametric rule-based design, subtractive fabrication, assembly techniques, and iterative design processes.

Prerequisite: (ARCH 1191 or 1112) and (ARCH 1291 or ARCH 1212) both with a grade of C or higher

ARCH 3591 Computer-Assisted Architectural Animation

2 cl hrs, 2 lab hrs, 3 cr

This elective course is an introduction to the use of the computer to assist in the production of 2D architectural animations, composite renderings, 3D animated models, time-lapse studies

and other architectural design tools. This course involves the use of the computer, methods of architectural rendering and animation, and the drawing and storage of computer animations with different devices. *Prerequisite:* (ARCH 1291 or ARCH 1212) with a grade of C or higher

ARCH 3609 Integrated Software in the Architectural Office

3 cl hrs, 3 cr

The course is designed to introduce the student to the variety of software that is being used in a design firm. The student will be provided with the guidelines for a better understanding of the integration of specialized software into all aspects of the architectural profession. The course focuses on managing a computerized office and understanding and using the latest technologies in a design firm. *Prerequisite:* (ARCH 1291 or ARCH 1212) with a grade of C or higher

ARCH 3610 Architectural Design VI

2 cl hrs, 6 lab hrs, 5 cr

An Advanced Design studio with an emphasis on a more complex building organization. The primary emphasis is in the further development and exploration of design principles involved in creating appropriate architecture, focusing on the integration of program, context, site, composition and space planning. *Prerequisite:* ARCH 3510 and (ARCH 1291 or ARCH 1212) all with a grade of C or higher

ARCH 3630 Advanced Detailing Studio

2 cl hrs, 6 lab hrs, 5 cr

An in-depth study and survey of some the various construction assemblies employed in the construction industry. The course focuses on architectural detailing as it applies to the use of materials, material assemblies and their components in the construction of buildings. Details of floor, interior and exterior walls, roof and foundation assemblies including materials and their responses to the elements and building loads are explored. *Prerequisites:* (ARCH 3531 or ARCH 2430) and ARCH 3510, both with a grade of C or higher, and (ARCH 3580 or ARCH 2480 or ARCH 2381)

ARCH 3631 Advanced Materials Workshop

3 cl hrs, 0 lab hrs, 3 cr

Building design and construction must anticipate an influx of smart materials which respond more acutely to environmental conditions and limitations. This course synthesizes research in materials science with

the latest technologies for tooling and measuring performance within the built environment. Materials to be researched and developed may include glass, ceramics, plastics and polymers, natural fibers and metal alloys. Students research materials with a particular focus on selection, sourcing, processing and assemblage. *Prerequisite:* (ARCH 1291 or ARCH 1212) with a grade of C or higher; *Pre- or corequisite:* ARCH 3531

ARCH 3640 Historic Preservation Theory and Practice

3 cl hrs, 0 lab hrs, 3 cr

A broad introduction to the history, theory, and practice of historic preservation. This course encourages understanding and critical thought about the principles and assumptions underlying the practice of historic preservation, including preservation law, preservation planning, adaptive use, design issues, and public history. This course, in combination with ARCH 3522 History of NYC Architecture and ARCH 4740 Construction Technology for Existing Buildings, comprises a concentration in Historic Preservation, which positions students for successful entry into preservation-oriented architectural and consulting firms, and related fields. *Prerequisite:* ENG 1101

ARCH 3662 Government Regulations and Approvals

3 cl hrs, 3 cr

This course familiarizes the student with the scope of the municipal agencies involved in approving the construction of a building in New York City. The class explores the process between the architect and these agencies in order to produce new and renovated buildings in a complex urban milieu. *Prerequisite:* ARCH 2330 with a grade of C or higher

ARCH 3690 Intermediate Computation and Fabrication

1 cl hr, 4 lab/studio hrs, 3 cr

Focus on parametric tools and digital prototyping techniques and practice. The course fosters a comprehensive understanding of exemplary construction and tectonic systems, as well as allowing students to develop a proficiency in applying this knowledge in constructing associative/parametric digital models that utilize tools to generate alternative variations of these systems. *Prerequisite:* ARCH3590

ARCH 3691 Advanced Design and Building Information Modeling

1 cl hr, 4 lab/studio hrs, 3 cr

This course focuses on the full development of an integrated design solution that leverages Computer Aided Design, 3D Modeling and Building Information Modeling tools. Student projects demonstrate a mature understanding of materials and their assembly and the structural and mechanical systems of a well-coordinated design. *Prerequisites:* ((ARCH 1291 or ARCH 1212) and ARCH 3531, both with a grade of C or higher); or AAS degree in Architecture or equivalent; or CMCE 1204 or CMCE 1224 or CMCE 2457; *Pre- or corequisite:* ARCH 3510 or ARCH 3610 or ARCH 3630 or ARCH 4710 or ARCH 4810 or ARCH 4830

ARCH 3900 Architecture Study Abroad

3 cl hrs, 0 lab hrs, 3 cr

Students gain an understanding of the architecture and urbanism of foreign cultures, through an intensive program of drawing, analysis, and historical studies. This program will be offered overseas. *Prerequisite:* ARCH 3510 with a grade of C or higher, or an AAS degree in Architecture or equivalent

ARCH 4400 Special Topics in Architecture

3 cl hrs, 3 cr

The field of architecture is in constant flux. The ability to adapt and respond quickly to new technologies, new techniques, new precedents and the construction of unique and noteworthy buildings and structures is a cornerstone of our profession. Special Topics in Architecture is designed to investigate a topic or concept based on changes in industry, current events in the field of architecture or the special expertise of a professor. *Prerequisite:* Departmental permission required

ARCH 4709 Advanced 3-Dimensional Modeling and Rendering

3 cl hrs, 3 cr

This elective course focuses on 3D modeling, rendering, lighting and animation techniques. Most advanced aspects of the rendering software will be explored through a series of exercises designed to acquaint the student with the various commands found within the program used. *Prerequisite:* (ARCH 1291 or ARCH 1212) with a grade of C or higher

ARCH 4710 Architectural Design VII: Urban Design

2 cl hrs, 6 lab hrs, 5 cr

This advanced design course covers a range of urban and architectural design issues. Students explore both the theoretical and pragmatic aspects of design applied in an urban environment. This course incorporates previous studio and lecture coursework to tie together topics of urban planning, architectural design, environmental sustainability and historic preservation. Using New York City as an urban laboratory, there are three research assignments and two design projects, varying in focus, size and complexity. Students address developing programs, the design of open public space, massing, open private space and the analysis of larger scale projects. Students work in a variety of formats: individually, in pairs, and in groups. Hand drawing, computer drafting and rendering, as well as physical and electronic modeling will be utilized for presentations. *Prerequisite:* (ARCH 3610 or ARCH 3630) and (ARCH 1291 or ARCH 1212) all with a grade of C or higher

ARCH 4740 Detail and Construction Technologies for Existing Buildings

2 cl hrs, 2 lab hrs, 3 cr

An extension and outgrowth of the sequence of four Building Technology Courses offered in the associate degree program. Students are given an opportunity to focus in greater detail on the material assemblies' aspect of building construction. *Prerequisite:* ARCH 2430 with a grade of C or higher; or CMCE 1204 or CMCE 1224 or CMCE 2457

ARCH 4750 Advanced Simulation for High Performance Buildings

1 cl hr, 4 lab hrs, 3 cr

Students learn how to use advanced building simulation tools and techniques to assess the impact of buildings and neighborhoods on thermal comfort and carbon footprint. For high performance buildings, passive and active design strategies are incorporated to find suitable solutions for a climate region. The simulation tools include a computational fluid dynamics (CFD) model and a nodal model. *Prerequisite:* ARCH 2430 or CMCE 2410 or ENVC 2340 or department permission. ARCH 3550 is strongly recommended

ARCH 4780
Case Studies in Structural Engineering

3 cl hr, 3 cr

The presentation and discussion of several case studies taken from real life. The course focuses on engineering principles required to assure the proper performance of actual structures in practice. Various case studies involving a spectrum of structural problems are presented and discussed. Emphasis placed on lessons learned from structural failures and what steps should be taken to avoid them. Students are encouraged to participate in the discussion and in the formulating of solutions to the problems. The theoretical principles governing the case studies are discussed.
Prerequisites: ARCH 2480, AAS degree in Architecture or equivalent, or AAS degree in Civil Engineering Technology or Construction Management or equivalent

ARCH 4791
Advanced Building Information Modeling and Integrated Project Delivery

1 cl hr, 4 lab/studio hrs, 3 cr

Building on BIM knowledge learned in previous courses students develop an understanding of BIM and Integrated Project Delivery through the research and presentation of case studies of existing projects and field trip(s) to current projects at different stages of the process from design to manufacture to implementation. They design and execute the development of a project component or building system using BIM software and fabrication equipment.
Prerequisites: ARCH 3691, AAS degree in Architecture or equivalent

ARCH 4810
Architectural Design VIII: Special Topics

2 cl hr, 6 lab hrs, 5 cr

This final studio expands upon the knowledge and skills acquired in the core design curriculum. Emphasis is on development of individualized approaches to the design process through the investigation of architectural building typologies in the areas of site, program, and/or technology. The beginning of this course focuses on research and analysis. The second portion of the course is a synthesis of this research into a student's individual design. The final design is presented to the class through architectural drawings and/or models. Ongoing critiques and final jury presentations are an integral part of the course. Each section has a specific focus of design.
Prerequisite: ARCH 4710 and (ARCH 1291 or ARCH 1212) all with a grade of C or higher

ARCH 4830
Construction Technology: Special Topics

2 cl hrs, 6 lab hrs, 5 credits

This course addresses special topics in advanced construction technology. Students are required to engage in the design and documentation of construction technologies. *in advanced construction technology. Students are required to engage in the design and documentation of construction technologies.*
Prerequisite: ARCH 4710 and (ARCH 1291 or ARCH 1212) all with a grade of C or higher

ARCH 4831
Design to Build

1 cl hr, 4 lab/studio hrs, 3 cr

This interdisciplinary course uses a hands-on approach that introduces students to Design Build methodology, practice and implementation. Students design, mock-up and build a series of individual projects using a variety of materials and machines to achieve their design. Lectures, demonstrations and field trips are geared to reinforce fabrication methodologies and demonstrate how Design/Build has been integrated into the practices of the design and building industry.
Prerequisite: AAS degree in Architecture or equivalent;
Corequisite: ARCH 3510 or ARCH 3610 or ARCH 3630 or ARCH 4710 or ARCH 4810 or ARCH 4830

ARCH 4861
Professional Practice

3 cl hrs, 3 cr

The course will provide an overview of basic business practices found in an architectural office, applying the principles, understanding the reasoning and offering examples in everyday office situations. The course will provide a comprehensive look at architectural practice, with emphasis on the management of firms and projects. The course is designed to help the student with an understanding of the everyday realities of practice and to help prepare for licensure.
Prerequisite: ARCH 2430 with a grade of C or higher

ARCH 4890
Computation and Fabrication: Performative Architecture

1 cl hr, 4 lab/studio hrs, 3 cr

Performative design in architecture is explored through the framework of biomimicry and algorithmic design. Different topics within performative architecture, such as high performance materials and adaptive building systems, are explored each semester. In addition to the advanced

fabrication tools presented in the course, analysis and simulation techniques are utilized in order to evaluate and inform the design of responsive architectural systems.
Prerequisite: ARCH 3590

ARCH 4900
Internship in Architectural Technology

1 cl hr, 120 field hrs per semester, 3 cr

Assignment to field work/study situations of approximately eight-to-ten hours per week at one of the following: an architectural office, engineering office, interior design office, architecture, engineering or interior design branch of a municipal agency or corporate design office, construction administration or office practices branch of a construction firm. A drafting position with a non-architectural firm is subject to review. Each student will keep a log/journal to be shared in group seminars. Supervision will be by faculty and by the job supervisor.
Prerequisites: ARCH 2410, ARCH 2430, both with a grade of C or higher, and approval of internship director

Communication Design

(formerly Advertising Design and Graphic Arts)

Professor Maria Guiliani, Interim Chair
Namm Hall, room N 1113
718.260.5175
email: mguiliani@citytech.cuny.edu

PROGRAMS:

Communication Design/AAS
Communication Design/BTech

FACULTY

ProfessorS: Holden, Michals, Spevack
Associate Professors: Biehl, Carr, Davis, Giraldo, Giuliani, Hitchings, McVicker, Wong
Assistant Professors: Adae, Garrastegui, Goetz, Kapusinski, Larkins, Neugeboren, Petrillo, Woolley

Chief CLT: Sherman
Senior CLT: Vazquez
CLT: Cannetti

Associate in Applied Science in COMMUNICATION DESIGN

The AAS degree program in Communication Design provides students with a solid foundation in the theory and current practices of the Communication Design profession and a grounding in general education. Students explore visual expression through a range of courses in figure drawing, design and color, typography, photography and web design. The program prepares students to continue on to upper-level course work and specialization in the design field. Graduates have a broad knowledge of the design profession, a solid foundation in liberal arts and sciences and a well-rounded portfolio. They are prepared to assist art directors and designers in entry-level positions in Communication Design.

New York City, a leading center of communication design in the United States with over 2,000 advertising agencies, design studios, publishing and new media companies, offers graduates many possibilities for full-time or free-lance employment in the field. Many graduates have gone on to earn baccalaureate and graduate degrees in the fields of advertising design, graphic design, fine arts and art education

Placement in the Associate Program

Placement in the associate in applied science program requires a high school diploma or GED. Students need not have majored in art in high school, but it is desirable that entering students have taken some prior courses in typography, layout, design and drawing or painting.

Advanced Standing Credits

The student admitted as a transfer is advised to go to the Office of the Registrar to obtain an application for advanced standing and file it with the Registrar during the announced filing period. Since there are differences in communication design courses offerings from one college to another, each application for advanced standing credits

will be reviewed individually. Credit will be granted for courses taken at other colleges if the courses are considered equivalent to those offered at New York City College of Technology. Final determination of credits for advanced standing will be made by the Registrar and the Chair of the Communication Design Department.

Program Outcomes

Graduates of the Communication Design AAS degree program are prepared to obtain entry-level employment in the communication design field. They are able to solve visual communication problems by applying design and studio skills. They have proficiency in a range of software applications for communication design. They are also qualified to enter a baccalaureate degree program in advertising design, animation/illustration/game design graphics, broadcast design, graphic design or web design.

Graduates will be able to:

- Think critically and creatively to solve visual communication problems.
- Continue on to baccalaureate-level course work in communication design.
- Demonstrate breadth of knowledge in communication design topics and career paths.
- Research and evaluate information sources.
- Communicate clearly and concisely in speech and writing.
- Demonstrate proficiency with current technology relevant to the design field.

Approximate Additional Costs other than Tuition and College-wide Fees

Textbooks	\$400
Professional Tools	\$500
Materials Fees.....	\$40
Supplies	\$600
Portfolio Preparation	\$150

GENERAL EDUCATION COMMON CORE ¹

21 CREDITS

I – REQUIRED CORE ² (4 COURSES, 12 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 3 credits)

MAT 1190	Quantitative Reasoning or higher	3
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Life and Physical Sciences (1 course, 3 credits)

Any approved course		3
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II – FLEXIBLE CORE (3 COURSES, 9 CREDITS)

In addition to the courses specified below, select one approved course from one other group

Creative Expression

ARTH 3311	The History of Graphic Design	3
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Individual and Society

PSY 1101 Introduction to Psychology 3

World Cultures and Global Issues

Any approved course

US Experience in its Diversity

Any approved course

Scientific World

Any approved course³

Writing Intensive Requirement⁴

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

39 CREDITS

Program-Specific Required Courses

33

COMD 1100	Graphic Design Principles I	3
COMD 1103	Foundation Drawing	2
COMD 1162	Raster and Vector Graphics	3
COMD 1167	Type and Media	4
COMD 1200	Graphic Design Principles II	3
COMD 1231	Figure Drawing	2
COMD 2300	Communication Design I	3
COMD 2327	Typographic Design II	2
COMD 2330	Digital Photography I	2
COMD 2400	Communication Design II	3
COMD 2427	Typographic Design III	2
COMD 2450	Web Design I	2
CDMG 1111	Digital Media Foundations	2
ARTH 3311	The History of Graphic Design	Met as GenEd
PSY 1101	Introduction to Psychology	Met as GenEd

Program-Specific Elective Courses

Select two 3-credit courses from the following		6
COMD 1292	3-Dimensional Design*	3
COMD 2313	Illustration I: Basic Principles*	3
COMD 2320	Intro to Film and Video Design Production	3
COMD 2340	Digital Photography II	3
COMD 2412	Packaging Design	3
COMD 3413	Illustration II: Character Design	3
CDMG 2316	Advanced Image Editing	3
CDMG 3532	Print Production for Designers	3

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 39

TOTAL NYS LIBERAL ARTS/SCIENCE CREDITS 21

TOTAL CREDITS REQUIRED FOR THE DEGREE 60

* Mandatory for students pursuing the Animation/Illustration/Game Design Graphics module in the Bachelors of Technology in Communication Design.

1 Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.

2 Specific courses listed are degree requirements that also meet CUNY Pathways general education requirements in that category.

3 PSY 3407 recommended for students planning to continue on to the bachelor of technology in Communication Design

4 A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#). Pre-Pathways students must follow the general education requirements listed in the catalog that applied on their year of entry into the program

Bachelor of Technology in COMMUNICATION DESIGN

The BTech degree, building on the solid foundation in visual expression of the first two years, develops students' abilities to frame, research and solve increasingly complex visual communication problems. It also offers students an opportunity to specialize in a specific area of expertise within the Communication Design field. Upon completing 60 credits, students select an area of concentration: Advertising Design, Animation/Illustration/ Game Design Graphics, Broadcast Design, Graphic Design, or Web Design. Students develop a professional portfolio that represents their talents and prepares them for employment upon graduation.

Program Outcomes

Graduates of the Communication Design bachelor of technology (BTech) degree program are prepared to obtain employment as designers, junior art directors, and art directors in advertising, graphic designers, art directors, web designers, broadcast designers, animators and game graphics designers. They demonstrate conceptual and creative design skills with a professional portfolio. They are also qualified to apply for masters programs in related communication design fields. In recent years, graduates of the program have been employed by such organizations as JC Penney, ABC-TV, SONY, Saatchi & Saatchi Advertising, Marriott, Book-of-the Month Club, DC Comics, Metropolitan Transit Authority, Simon & Schuster, McGraw-Hill, Draft-FCB Advertising, Fairchild Publications, Citicorp, Grey Advertising and many others.

Graduates will be able to:

- Think critically and creatively to solve visual communication problems.
- Function as designers in a professional context or pursue graduate level study in design.
- Organize and interpret complex data.
- Research and evaluate information sources.
- Communicate clearly and concisely in speech and writing.
- Identify, evaluate and effectively respond to ethical issues as citizens and professionals.
- Develop multiple viable solutions to design problems.
- Create portfolios representing conceptual and visual problem solving abilities.
- Value cultural diversity and demonstrate the capacity to collaborate.
- Grow and adapt, personally and professionally.

Admission to the Bachelor of Technology Program

There are many ways a student can enter the bachelor of technology program in Communication Design. Students who enter the program as freshmen must meet the College standards. For more information on these guidelines, [Click here](#). Students who do not meet these guidelines may be admitted into the AAS degree program in Communication Design and apply to transfer into the BTech program after achieving CUNY proficiency in reading, writing and mathematics. Students may also enter from other programs either here at City Tech or from other colleges. It is not necessary to have earned an associate degree at all. Transcripts and portfolios of entering students will be evaluated to determine the courses they must complete for the bachelor of technology degree. The department also has articulation agreements with specific departments and programs at Borough of Manhattan, Bronx and Kingsborough Community Colleges. Students from these colleges who complete all specific course requirements will not be required to take more than 60 credits to complete the BTech program. Please consult the department for further information.

All students admitted to programs of upper-division study in The City University of New York are required to meet standards of proficiency in reading, writing and mathematics, demonstrated by passing CUNY skills assessment tests in these three areas to become eligible for baccalaureate-level courses. Those who do not demonstrate the necessary proficiency upon entry must complete developmental courses. Students who have not achieved proficiency in all three areas will be denied access to communication design courses.

Advanced Standing Credit

There are great differences in communication design course offerings from one college to another. Credit will be granted for courses taken at other colleges if the courses are considered equivalent to those offered at New York City College of Technology. Final determination of credits for advanced standing granted to any student in this department will be made by the Registrar of New York City College of Technology and the Chair of the Communication Design Department.

The department currently has articulation agreements with specific departments, degrees, and programs at Bronx Community College, Borough of Manhattan Community College, and Kingsborough Community College.

Approximate Additional Costs other than Tuition and College-wide Fees for the Baccalaureate Degree Program

Textbooks	\$750
Materials and supplies	\$1500

GENERAL EDUCATION COMMON CORE ¹

42 CREDITS

I – REQUIRED CORE (4 COURSES, 12 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I*	3
ENG 1121	English Composition II*	3

Mathematical and Quantitative Reasoning (1 course, 3 credits)

Select one of the following courses

MAT 1190	Quantitative Reasoning or higher*	3
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Life and Physical Sciences (1 course, 3 credits)

Any approved course*		3
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II – FLEXIBLE CORE ² (6 COURSES, 18 CREDITS)

In addition to the courses specified below, select three courses from the remaining areas; no more than two courses may be selected from any discipline. In meeting these requirements, in addition to the required classes, students must choose one of the following: a second Pathways-approved ARTH 1100-series course or AFR 1301 or 1304.

World Cultures and Global Issues

Any approved course

US Experience in its Diversity

Any approved course

Creative Expression

ARTH 3311	The History of Graphic Design*	3
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Individual and Society

PSY 1101	Introduction to Psychology*	3
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Scientific World

PSY 3407	Psychology of Visual Perception	3
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One additional course from any group

Any approved course		3
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Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

III – COLLEGE OPTION REQUIREMENT ³ (12 CREDITS)

- One course in Speech/Oral Communication
COM 1330 Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course
SBS 2000 Research Methods for the Social and Behavioral Sciences 3
- Additional liberal arts credits to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language 6

PROGRAM-SPECIFIC DEGREE REQUIREMENTS		78 CREDITS	Animation/Illustration/Game Design Graphics Module	
Associate-Level Courses (39 credits from AAS)			Option A	
COMD 1100	Graphic Design Principles I	3	COMD 3508 ⁴	Introduction to Game Design Concepts 3
COMD 1103	Foundation Drawing	2	COMD 3523	Storyboard Concepts 3
COMD 1162	Raster and Vector Graphics	3	COMD 3540 ⁴	2-Dimensional Animation I 3
COMD 1167	Type and Media	4	COMD 3640 ⁴	3-Dimensional Animation and Modeling I 3
COMD 1200	Graphic Design Principles II	3	COMD 3641	2-Dimensional Animation II 3
COMD 1231	Figure Drawing	2	COMD 3740 ⁴	3-Dimensional Animation and Modeling II 3
COMD 2300	Communication Design I	3	COMD 3808 ⁴	3-Dimensional Game Graphics 3
COMD 2327	Typographic Design II	2	COMD 4640 ⁴	3-Dimensional Animation and Modeling III 3
COMD 2330	Digital Photography I	2	Option B	
COMD 2400	Communication Design II	3	COMD 3413	Illustration II: Character Design 3
COMD 2427	Typographic Design III	2	COMD 3508 ⁴	Introduction to Game Design Concepts 3
COMD 2450	Web Design I	2	COMD 3513 ⁴	Illustration III: Narrative 3
CDMG 1111	Digital Media Foundations	2	COMD 3523	Storyboard Concepts 3
Program-Specific Elective Courses			COMD 3540 ⁴	2-Dimensional Animation I 3
Select two 3-credit courses from the following		6	COMD 3613 ⁴	Illustration IV: Professional Practice 3
COMD 1292	3-Dimensional Design	3	COMD 3640 ⁴	3-Dimensional Animation and Modeling I 3
COMD 2313	Illustration I: Basic Principles	3	Additional Program-Specific Courses	
COMD 2320	Intro to Film and Video Design Production	3	COMD 4701	The Design Team 3
COMD 2340	Digital Photography II	3	COMD 4801	The Portfolio 3
COMD 2412	Packaging Design	3	COMD 4830	Senior Project 3
COMD 3413	Illustration II: Character Design	3	COMD 4900	Internship in Communication Design 3
CDMG 2316	Advanced Image Editing	3	ARTH 1100-series	Art History course Met as GenEd
CDMG 3532	Print Production for Designers	3	or	
Baccalaureate-Level Courses			AFR 1301	Introduction to the Art of Africa
Select one module (6-8 required courses)		18-24	or	
Web Design Module			AFR 1304	African American/Caribbean Art
COMD 3551	Web Design II: Advanced XHTML & CSS	3	ARTH 3311	The History of Graphic Design Met as GenEd
COMD 3562	UX and UI Design	3	PSY 1101	Introduction to Psychology Met as GenEd
COMD 3563	Web Traffic and Analytics	3	PSY 3407	Psychology of Visual Perception Met as GenEd
COMD 3652	Web Design III: Design Studio	3	SBS 2000	Research methods in the Social and Behavioral Sciences
COMD 3662	Interactive Animation	3	or Foreign Language	
COMD 3663	Dynamic Web I: Web 2.0	3	Met as GenEd	
Graphic Design Module			Program-specific electives to reach or exceed 120 credits	
COMD 3501	Corporate Identity Design	3	Choose from approved list	
COMD 3503	Topics in Graphic Design	3	COMD BTech electives	
COMD 3527	Advanced Typography	3	CDMG 2316	Digital Imaging Production
COMD 3601	Information Design I	3	CDMG 3532	Print Production for Designers
COMD 4611	Publication Design	3	CDMG 3607	Digital Data Asset Management
CDMG 3532	Print Production for Designers	3	CDMG 3611	Vector Art Editing
Advertising Design Module			COMD 1292	3D Design
COMD 3500	Campaign Development I	3	COMD 2313	Illustration I: Basic Principles
COMD 3523	Storyboard Concepts	3	COMD 2320	Intro to Film & Video Production
COMD 3600	Campaign Development II	3	COMD 2340	Digital Photography II
COMD 3610	Interactive Art Direction for Advertising	3	COMD 2412	Packaging Design
COMD 3662	Interactive Animation	3	COMD 3413	Illustration II: Character Design
CDMG 3532	Print Production for Designers	3	COMD 3500	Campaign Development I
Broadcast Design Module			COMD 3501	Corporate Identity Design
COMD 3521 ⁴	Motion Graphics I	3	COMD 3502	Topics in Advertising
COMD 3523	Storyboard Concepts	3	COMD 3503	Topics in Graphic Design
COMD 3620 ⁴	Broadcast Design I	3	COMD 3508	Intro to Game Design Concepts
COMD 3621 ⁴	Motion Graphics II	3		
COMD 3630 ⁴	Broadcast Design II	3		
ENT 3390	Sound for Multimedia	3		

COMD 3513	Illustration III: Narrative
COMD 3521	Motion Graphics I
COMD 3523	Storyboard Concepts
COMD 3527	Advanced Typography
COMD 3530	Advanced Photo Studio
CDMG 3532	Print Production for Designers
COMD 3540	2D Animation I
COMD 3551	Web Design II Advanced XHTML & CSS
COMD 3562	Web Site Architecture
COMD 3563	Web Analytics, SEO & SEM
COMD 3600	Campaign Development II
COMD 3601	Information Design
COMD 3603	Topics in Typography
COMD 3610	Interactive Art Direction for Advertising
COMD 3613	Illustration IV: Professional Practice
COMD 3620	Broadcast Design I
COMD 3621	Motion Graphics II
COMD 3627	Time-Based Typography
COMD 3630	Broadcast Design II
COMD 3640	3D Animation & Modeling I
COMD 3641	2D Animation II
COMD 3652	Web Design III / Design Studio
COMD 3662	Interactive Animation
COMD 3663	Dynamic Web I: Web 2.0
COMD 3712	Topics in Packaging Design
COMD 3808	3D Game Graphics
COMD 4611	Desktop Publication Design I
COMD 4711	Desktop Publication Design II
COMD 4713	Advanced Illustration III
COMD 4741	2D Animation III
COMD 4762	Interactive Interface Design
COMD 4763	Dynamic Web II
COMD 4764	Design for Mobile Devices
COMD 4843	Career Strategies for Animation
COMD 4860	Streaming Media for the Web
COMD 4640	3D Animation & Modeling III
LIB 1201	Research & Documentation In Information Age
MKT 241	Marketing Management
ENT 3390	Sound for Multimedia
ENG 2570	Writing in the Workplace
ENG 2575	Technical Writing
ARTH	Any Art History course
AFR 1301	Introduction to the Art of Africa
AFR 1304	African American Caribbean Art

CST Web Module Courses

CST 2301	Multimedia and Mobile Device Programming (If a student already took the course as part of AAS degree requirement, he/she will need to take another 3 credit elective course)
CST 3513	Object-Oriented Programming
CST 3519	Advanced Web Client Technologies
CST 3606	Object-Oriented Systems Analysis and Design
CST 3613	Application Development with Databases
CST 4708	Software Development and .NET Framework
CST 4713	Dynamic Web Development: Servlets and JSP

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES	78
TOTAL NYS LIBERAL ARTS/SCIENCE CREDITS	42
TOTAL CREDITS REQUIRED FOR THE DEGREE	120

**Courses required for associate degree*

1 Specific courses listed are degree requirements that also meet CUNY Pathways general education requirements in that category..

2 Transfer credit for these Flexible Core areas supersedes and replaces the specific requirements listed.

3 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

4 Potential substitutes are any COMD 3500 level course, or CDMG 3611

COURSES:

(In accordance with the department name change in Spring 2015, ADV courses are now COMD and GRA courses are now CDMG.)

COMD 1100

Graphic Design Principles I

1 cl hr, 5 lab hrs, 3 cr

This basic design and color theory course explores graphic communication through the understanding of the elements and principles of design, as well as the design process, including idea development through final execution. Students develop basic skills in two-dimensional design, color and content creation while employing the design process of research, sketching and experimentation. Communication designers use the concepts explored in this course in disciplines such as advertising, graphic design, web design, illustration, broadcast design, photography, and game design.

Prerequisite: CUNY proficiency in reading, writing and mathematics or concurrent enrollment in ENG 092R, ESOL 022R or 032R; ENG 092W, ESOL 021W, or ESOL 031W; MAT 0630 or MAT 0650 as required

COMD 1103

Foundation Drawing

1 cl hr, 3 lab hrs, 2 cr

This drawing course introduces basic concepts, tools, techniques and the role of drawing in design, illustration, animation and games. The course will also cover projection systems, plans, elevations, sections, oblique, isometric, one point perspective and two point perspective views.

Prerequisite: CUNY proficiency in reading, writing and mathematics or concurrent enrollment in ENG 092R, ESOL 022R or 032R; ENG 092W, ESOL 021W, or ESOL 031W; MAT 0630 or MAT 0650 as required

COMD 1162

Raster and Vector Graphics

2 cl hrs, 2 lab hrs, 3 cr

Basic concepts related to the two fundamental digital graphic forms (raster and vector graphics) and learning best uses and practices for each. This course covers basic digital imaging terminology and techniques including size, resolution, color space, file elements, measurements, file formats, and scanning software and hardware. Class projects require students to explore the meaning of communication through design and how it correlates with client satisfaction and target audience. Students become proficient with both raster and vector applications, such as Adobe Photoshop and Adobe Illustrator.

Prerequisite: CUNY proficiency in

reading, writing and mathematics or concurrent enrollment in ENG 092R, ESOL 022R or 032R; ENG 092W, ESOL 021W, or ESOL 031W; MAT 0630 or MAT 0650 as required

COMD 1167

Type and Media

2 cl hrs, 4 lab hrs, 4 cr

Foundation course in typography with emphasis on using type for multiple industry related applications ranging from print to interactive. Students will be introduced to principles of type design and terminology including: variations of type structure, font usage, grid, leading, kerning, tracking and alignment. Students will learn industry standard software such as InDesign on the Macintosh operating system.

Prerequisite: CUNY proficiency in reading, writing and mathematics or concurrent enrollment in ENG 092R, ESOL 022R or 032R; ENG 092W, ESOL 021W, or ESOL 031W; MAT 0630 or MAT 0650 as required.

Equivalent to old course ADV 1160 or ADV 1161

COMD 1200

Graphic Design Principles II

1 cl hr, 5 lab hrs, 3 cr

This course explores creative visual thinking and its importance to communication design. Students will experiment with image making techniques and learn to use graphic elements to communicate concepts and ideas. The course will emphasize the integration of communication concepts, type and graphics and its relationship to multiple disciplines such as advertising, graphic design, web design, illustration, broadcast design, production, and others. Students develop projects from thumbnails through final presentations.

Prerequisites: COMD 1100, COMD 1167

COMD 1213

Structural Analysis

COMD Elective

1 cl hr, 2 lab hrs, 2 cr

Introduction to structural drawing and the rendering of three-dimensional form. Perspective, composition, light and shade. Merchandise and decorative drawing techniques from the preparatory and pre-rendered stages of representation through the layout stage. Use of dry media in both black and white and color.

Prerequisites: COMD 1100, COMD 1103

COMD 1215

Printmaking

COMD Elective

1 cl hr, 2 lab hrs, 2 cr

The study and practice of fine art printmaking techniques: etching, lithography, relief printing methods and silk-screen.

Prerequisites: COMD 1100, COMD 1103

COMD 1227

Typographic Design I

1 cl hr, 2 lab hrs, 2 cr

Foundation course in typography. Introduction to the basic alphabet families and terminology of type: variations of type structure, font usage, grid, leading, kerning, tracking and alignment. The computer is used to introduce students to these concepts (QuarkXpress, Adobe InDesign). Emphasis is placed on developing appropriate use of type with current technology.

Prerequisite: COMD 1162, COMD 1167
Equivalent to old course ADV 1117

COMD 1231

Figure Drawing

1cl hr, 3 lab hrs, 2 cr

This advanced drawing course develops visual awareness of the human figure. Sensitivity to line, volume, light and shade are explored. Communication designers use the concepts developed in this course in disciplines such as advertising, graphic design, illustration, broadcast design, animation and photography.

Prerequisite: COMD 1103
Course includes drawing nude model
Equivalent to old course ADV 1113

COMD 1292

3-Dimensional Design

2 cl hr, 2 lab hrs, 3 cr

Principles of 3D design. Topics include geometric solids, architectonic organization of space, light and shadow, relief, the modular unit, motion, form and structure in nature. Applications to packaging, architecture, sculpture, environmental graphics. Investigation of the relationship between material and form.

Prerequisite: COMD 1100, COMD 1103
Equivalent to old course ADV 1212

COMD 2300

Communication Design I

1 cl hr, 5 lab hrs, 3 cr

This is a foundation course in advertising and graphic design. Students are challenged to combine foundation skills with conceptual

thinking in order to develop creative solutions. Students develop the ability to communicate ideas visually through art direction, and verbally through copywriting. Project-based assignments from concept through digital output challenge students to consider the relationship between the product, its target audience and marketing objectives. Students learn the importance of conceptual thinking, professional execution and presentation of their ideas. Students may work in teams on the concept, design and development process.

Prerequisites: COMD 1200, COMD 2327

COMD 2313

Illustration I: Basic Principles

2 cl hr, 2 lab hrs, 3 cr

This course is an introduction to illustration and includes projects and lectures in product, storyboard, book cover, poster and political imagery. Pencil, pen and ink, brush and paint and collage are some of the materials used in this course.

Prerequisites: COMD 1231, CUNY proficiency in reading, writing and mathematics

COMD 2320

Introduction to Film and Video Production Design

2 cl hrs, 2 lab hrs, 3 cr

An introduction to the basic components and practices of pre-production and production methodologies for content creation in commercial video and film production. Through lectures, reading assignments, screenings and practice, students will learn the basics of all stages of production inclusive of the processes of forming and working in production management teams, creating effective production aesthetics in pre-production and production stages, scriptwriting and storyboarding, cinematography aesthetics (lighting and camera), and design and graphics functions in editing. Students will explore several modes of communication such as commercials, public service announcements, fictive works, documentary and journalism and learn how to convey information and messages to a target audience.

Prerequisite: CDMG 1111

COMD 2327

Typographic Design II

1 cl hr, 2 lab hrs, 2 cr

Introduces a variety of basic layouts and formats, building technical and practical fluency in setting and working with type for both print and

screen. This course further explores topics learned in COMD 1167 Type and Media, such as typeface selection and the use of the typographical grids. Problem-solving for most common typographical problems is discussed.

Prerequisite: COMD 1167

Equivalent to old course ADV 1217

COMD 2330 Digital Photography I

1 cl hr, 3 lab hrs, 2 cr

This course will explore the foundational concepts of light and exposure in photography. The student will develop framing and compositional skills as well as an understanding of the unique formal properties of photography. Students will become acquainted with a wide range of contemporary photographers and gain an understanding of how photographic style can transform subject matter.

Using professional lighting equipment, cameras and software, the student will gain hands-on experience capturing, processing, and printing digital images.

Prerequisite: CUNY proficiency in reading, writing and math

Equivalent to old course GRA 1130

COMD 2340 Digital Photography II

2 cl hrs, 2 lab hrs, 3 cr

In this class, the emphasis will be on creative problem solving with photography for the Communication Design field. The emphasis will be on using style to transform subject matter in order to communicate ideas. In addition, each student will create a coherent body of work on a topic of his or her choice. Students will be exposed to a wide range of contemporary photographers from a range of genres. Advanced digital darkroom, color correction, and color management procedures will be covered in addition to facilitate students' professional-level portfolio development.

Prerequisite: COMD 2330

Equivalent to old course ADV 1230

COMD 2400 Communication Design II

1 cl hr, 5 lab hrs, 3 cr

In this course, students learn to refine their conceptual thinking, and the ability to apply design concepts across various media channels. This course challenges students to think and strategically apply campaign ideas. At this stage, students choose a media placement and incorporate it into the solution. The course also introduces the collaborative relationship between Art Director and Copywriter. Student teams brainstorm, develop copy, art direct and pitch ideas in teams. Students will explore the dialogue

between products and services and how to communicate their benefits and features to the intended target.

Project-based assignments from concept through final digital output are an integral part of the course.

Prerequisites: COMD 1162, COMD 2300; *Corequisite:* COMD 2427

COMD 2412 Packaging Design

COMD Elective

2 cl hr, 2 lab hrs, 3 cr

Graphic and structural aspects of packaging design and production. Exploration of the role of the consumer and target audiences. Methods of product protection and display are investigated through a wide range of design projects from the gift package to cartons and plastic containers. Students will produce three-dimensional comprehensives and industry-standard digital mechanicals for each assignment using primarily Adobe Illustrator.

Prerequisite: COMD 2300

COMD 2427 Typographic Design III

1 cl hr, 2 lab hrs, 2 cr

Advanced typographic design principles. Typographic applications for web design, print and motion graphics are explored, as well as integration of design and production in the laboratory.

Prerequisite: COMD 1167

Equivalent to old course ADV 2317

COMD 2450 Web Design I

1 cl hr, 3 lab hrs, 2 cr

Required for all associate level students, this capstone course is designed to showcase work done in previous courses. Focused on website design and development, topics include creative user interface design and best workflow practice. Students design a portfolio website using an HTML template, and learn web design, typography and web programming skills. HTML and CSS are taught.

Prerequisite: COMD 2300 or CDMG 2300 or department approval

Equivalent to old course ADV 3550

COMD 3213 Painting and Composition

COMD Elective

2 cl hr, 2 lab hrs, 3 cr

The exploration of imagery and visual ideas in traditional painting genre including still life and the figure. Interpretive use of graphic components and painting techniques in visual expression.

Prerequisites: COMD 2313, COMD 2400

Equivalent to old course ADV 1220

COMD 3413 Illustration II: Character Design

COMD Elective

2 cl hr, 2 lab hrs, 3 cr

Problems in researching and creating finished illustrations. Exploration of the figure in a variety of interior and exterior spaces. Investigation of illustration for topics including editorial, magazine covers, children's books, advertising and on-site reporting. A variety of techniques such as gouache, watercolor, wash, pen and ink will be demonstrated. Each student will also prepare a final illustration portfolio for presentation.

Prerequisite: COMD 1162, COMD 2313

Equivalent to old course ADV 2413

COMD 3500 Campaign Development I

3 cl hrs, 3 cr

This course is an in-depth exploration of the creative advertising campaign and related media. Working individually and/or in teams, students will research, develop creative concepts and design packaged goods and service sector campaigns. Preparation of finished artwork using software such as QuarkXpress and the Adobe Creative Suite.

Prerequisite: COMD 2400-level courses or equivalent or department approval

COMD 3501 Corporate Identity Design I

3 cl hrs, 3 cr

The role of the designer in the graphic communication process. In-depth exploration of corporate identity programs. Design projects with multiple components, presentation and design practice, preparation of finished artwork using software such as QuarkXpress and the Adobe Creative Suite.

Prerequisite: COMD 2427

COMD 3502 Topics in Advertising

3 cl hrs, 3 cr

Historical development of the advertising agency; the "creative revolution" and its legendary practitioners, trends and outlook. Marketing concepts and advertising strategy: objectives, research, creative development and execution of the advertising campaign. Visual and copy solutions for print and electronic media. The role of advertising in direct marketing, interactive TV and the Internet. The growth of international advertising. Ethical issues and regulatory restraints. Research and creative assignments combined with illustrated lectures and discussion.

Prerequisite: COMD 2400-level courses or equivalent

COMD 3503 Topics in Graphic Design

3 cl hrs, 3 cr

The role of the graphic designer in contemporary visual communications with related design assignments and research. Graphic design trends, the impact of computer technology, examination of the work of major 20th century designers, global graphics, the ongoing dialogue between advertising and graphic design.

Prerequisite: Any COMD 2400-level course

COMD 3508 Introduction to Game Design Concepts

2 cl hrs, 2 lab hrs, 3 cr

Introduction to the principles, practice and techniques of game design. The first part of the course will focus on game design theory and history. Students will critically examine strategy and puzzle games, game structure types, 2D and 3D games, storytelling in games, cut scenes, difficulty curves and multiplayer/single player games. The course will also explore the game design process from research and development, to character and environment concepts, design specifications and level and user interaction design. The role of games editors, game physics and digital modeling will also be studied.

The course will also examine the design production process, production realities, prototyping and how to pitch ideas. Case studies of contemporary games will be an integral part of lectures and laboratory exercises. Working individually or in teams, students will research, write, design, storyboard and pitch games. Software applications such as Maya, Milkshape 3D or Blender may be used.

Prerequisite: COMD 2450 and COMD 3523, or MTEC 2120 and MTEC 3125;

Pre- or corequisite: COMD 3523

COMD 3513 Illustration III: Narrative

3cl hrs, 3 cr

The development of personal expression, from concept to finish. Exploration of a variety of wet and dry media in combination with a heightened control of media. Assignments will reflect the diversity of the professional marketplace: editorial illustration and social commentary, illustration of books, poems, magazine articles, short stories, posters, book jackets, annual reports, etc. Through all phases of assignments the function of good drawing, painting, design, compositional skills, and conceptual ability will be major points of emphasis.

Prerequisite: COMD 3413, COMD 3523

COMD 3521
Motion Graphics I
2 cl hrs, 2 lab hrs, 3 cr

Introduction to the theory and principles of motion graphics. The course will explore the role of motion graphics in dynamic digital media for film, video, television, the Internet, DVD interface design, video game design and interactive interface design. Integration of graphics, color, typography, photography and sound. Case studies of contemporary designers will be an integral part of lectures and laboratory exercises. Working individually or in teams, students will research, write, design, storyboard and produce motion graphics for film titles, promotional videos, advertising and television graphics using software such as Photoshop, Illustrator, Flash, AfterEffects or Final Cut Pro.
Prerequisite: COMD 2400, COMD 2427, COMD 3523; Pre- or corequisite: ENT 3317

COMD 3523
Storyboard Concepts
3 cl hrs, 3 cr

The storyboard is the visual version of the script and is essential when communicating ideas in visual forms. This versatile tool is used when selling rough ideas internally, fleshing out ideas for client comps and as a blueprint during production. This course will focus on communicating ideas clearly within a number of panels. This type of visual based communication expresses ideas in a linear sequence of events as demonstrated in: comics, graphic novels, commercials or movies. Visual based communication that is non-linear, such as choose-your-own-adventure or digital formats will also be covered. The emphasis in this class is on story, idea development and determining the best way to get the point across visually. Students will design and present storyboards for topics including commercials, film and television titles and video presentations.
Prerequisite: COMD 1231, COMD 2400, MTEC 3125

COMD 3527
Advanced Typography
2 cl hrs, 2 lab hrs, 3 cr

Sensibility toward design and type is intensely explored. Exercises challenge creativity and visual aesthetics with emphasis on type. Typographical assignments are presented through themed projects. Layouts vary greatly from one-page to multiple-page problems. Exercises are geared to develop sensitivity to the integration of typography and with a variety of visual imagery. Page publication applications are used. In addition, there are advanced exercises in font management and file preparation.
Prerequisite: COMD 2427

COMD 3530
Advanced Photography Studio
1 cl hr, 4 lab hr, 3 cr

In this studio photography course, students use lighting to transform subject matter into metaphor, mood and meaning as well as learn how to develop visual coherence within a group of images. Students develop portfolio level projects that display conceptual thinking and mastery of the craft of photography.
Prerequisite: COMD 2340

COMD 3540
2-Dimensional Animation
1 cl hr, 2 lab hrs, 2 cr

Introduces students to the history, design principles and techniques of two-dimensional animation. Students create a variety of projects including storyboards, flipbooks, camera-less films, cutouts and still-photo animation. Experiments in time-lapse, pixellation and object animation. Illustrated lectures and a field trip to an animation studio.
Prerequisite: COMD 1231, COMD 2400, MTEC 3125

COMD 3551
Web Design II– Advanced XHTML and CSS
2 cl hrs, 2 lab hrs, 3 cr

After taking the introductory COMD 2450, Web Design I, this is the first course for students majoring in web design. Students will learn to use both graphics software, such as Dreamweaver, and to manipulate the code (XHTML, CSS) to improve on web optimization and to create clean code. Forms and integration of other technologies will be practiced.
Prerequisite: COMD 2450

COMD 3562
UX and UI Design
2 cl hrs, 2 lab hrs, 3 cr

Building on skills learned in COMD 3551, topics include advanced CSS, Javascript and Flash integration. Students work with clients to design and construct a professional working website following contemporary web and accessibility standards. Software such as Dreamweaver and Flash are used for construction and maintenance. A working knowledge of XHTML and CSS is required.
Prerequisite: COMD 2450

COMD 3563
Web Traffic and Analytics
2 cl hrs, 2 lab hrs, 3 cr

In this course students will learn how to effectively direct traffic to a website. Topics will include implementing Web Analytics, Search Engine Optimization, and Search Engine Marketing. They will analyze data and assess reports on traffic to web sites; learn to write

content to rank for key search terms, and to choose appropriately, and implement the best strategies that help to drive traffic to web sites.
Prerequisite: COMD 2450 or pre- or corequisite BUF 3400

COMD 3600
Campaign Development II
3 cl hrs, 3 cr

This course is a continued exploration of the creative advertising campaign. Application of research, design principles and creative concepts to retail advertising, public relations, business and international advertising. Preparation of finished artwork using software such as QuarkXpress and the Adobe Creative Suite.
Prerequisite: COMD 3500

COMD 3601
Information Design I
3 cl hrs, 3 cr

Continuation of the development of skills learned in COMD 3501 applied to information graphics, exhibition design and wayfinding systems. Preparation and presentation of finished artwork using software such as QuarkXpress and the Adobe Creative Suite.
Prerequisite: COMD 2427

COMD 3603
Topics in Typography
3 cl hrs, 3 cr

Lectures and discussion of current topics in typography with related research and design assignments. These may include new developments in digital typography, current typographic trends, research into the work of historical and contemporary type designers, examination and use of typographic design reference materials.
Prerequisite: COMD 3500 or COMD 3501, or COMD 3502 or COMD 3503 or COMD 3513 or COMD 3530

COMD 3610
Interactive Art Direction for Advertising
2 cl hrs, 2 lab hrs, 3 cr

The class will prepare interactive art directors to accomplish the client's business objectives while engaging users. Students will conceptualize, design and develop online advertising campaigns. The three primary objectives of an online campaign: driving traffic, acquisition and lead generation will be covered. The course will also discuss the relationship between the ads and the website destination. Students will develop three types of ads: Basic Flash animations, Rich-Content ad with video, sound and simple games and Rich-Media ad that expand or take over the screen.
Prerequisites: COMD 3662 or COMD 3563 or COMD 3562

COMD 3613
Illustration IV: Professional Practice
3 cl hrs, 3 cr

A continuation of COMD 3513, Advanced Illustration I. It brings together the technical skills and conceptual abilities accumulated over previous courses and encourages further exploration into personal expression. Analysis and discussion of the work of prominent illustrators. Digital media will be explored, using Adobe Illustrator, Adobe Photoshop and other software. Each assignment will be treated by the instructor and student as a professional commission and upon completion will be considered a portfolio piece. Practical considerations will be covered as well: pricing, self-promotion, client targeting and solicitation, professional organizations.
Prerequisite: COMD 3513

COMD 3620
Broadcast Design I
2 cl hrs, 2 lab hrs, 3 cr

Through lectures, demonstrations and hands-on practice, students will learn how to create, produce and edit a digital video project. Topics include: (1) pre-production – creative concept, storyboarding, scripting, location selection, creative and production team member roles and responsibilities, props and casting; shot and lighting analysis; (2) production – recording video and audio, lighting; (3) post-production – processing, editing, compiling, final output to the web DVD or tape using software such as Final Cut Pro, Adobe Premiere and Sound Edit 16.
Prerequisites: COMD 3500 or COMD 3501 or COMD 3530 or department approval

COMD 3621
Motion Graphics II
2 cl hrs, 2 lab hrs, 3 cr

A continuation of COMD 3521, Motion Graphics I. Integration of graphics, color, typography, photography and sound. Case studies of contemporary designers will be an integral part of lectures and laboratory exercises. Working individually or in teams, students will research, write, design, storyboard and produce motion graphics for DVD menus, video games, web banners or interactive interface device design using software such as Flash, Maya, AfterEffects or Final Cut Pro.
Prerequisite: COMD 3521 or department approval

COMD 3627**Time-based Typography***2 cl hrs, 2 lab hrs, 3 cr*

Introduction to the theory and principles of time-based typography and its role in motion graphics to inform, brand, educate and entertain. The course will explore how typography is used in dynamic digital media for film, video, television, the Internet, DVD interface design, video game design and interactive interface design. Design case studies will be an integral part of lectures. Working individually or in teams, students will research, write, design, storyboard and produce time-based typographic title sequences for screen-based media using software such as Flash, Final Cut Pro, DVD Studio Pro, AfterEffects or Final Cut Pro.

Prerequisites: COMD 3620 and COMD 3630 or department approval; Pre- or corequisite: ENT 3390

COMD 3630**Broadcast Design II***2 cl hrs, 2 lab hrs, 3 cr*

Theory and practice in advanced forms of digital video. Emphasizes the integration of special effects incorporating typography, graphics and photography. Students create an advanced digital video project for output to the World Wide Web and/or DVD with software such as Adobe AfterEffects. Students also learn new protocols required for creating and delivering video for the World Wide Web and DVD.

Prerequisite: COMD 3620 or department approval

COMD 3640**3-Dimensional Animation and Modeling I***2 cl hrs, 2 lab hrs, 3 cr*

An introduction to computer 3D modeling, rendering and animation using the Maya software environment. Students learn basic tools and techniques. While exploring 3D design aesthetics, the course emphasizes the practical and technical features of the software.

COMD 2400 or MTEC 3125

COMD 3641**2-Dimensional Animation II***2 cl hrs, 2 lab hrs, 3 cr*

This course continues to develop animation skills learned in COMD 3540, Animation I. Students will create a variety of projects using sophisticated techniques of animating characters' thoughts and emotions. Topics will include model sheets, animal anatomy, and character turnarounds. Effects animation will also be covered to gain basic understanding of the physical laws and properties of non-

character elements such as fire, water and pixie dust. Students will also learn to use field guides, exposure sheets, pans and trucks. Emphasis will be placed on the development of professional work practices, creative problem solving techniques and critical thinking skills.

Prerequisite: COMD 3540

COMD 3642**Topics in Animation and Motion Graphics***3 cl hrs, 3 cr*

An overview and study of the history of animation and motion graphics. Each class will focus on the work of various animators within a specific time period or genre, from the early magic lantern shows of the late nineteenth century to current and emerging digital animation technologies. The course objective is to explore the lives and environments, artistic and narrative influences of these animators through a series of discussions, lectures, assignments, and viewing DVDs and videos.

Prerequisite: COMD 3500 level courses

COMD 3652**Web Design III – Design Studio***2 cl hrs, 2 lab hrs, 3 cr*

Development of skills learned in Web II such as XHTML, CSS, and introduction of the Document Object Module (DOM). Students will combine skills learned in Web I & II; Analytics, Search Engine Optimization (SEO) & Search Engine Marketing (SEM) and other technologies to create a web site with rich media (audio and video elements). Requires previously built site for analytic assessment and SEO improvements.

Prerequisite: COMD 3551 or department approval

COMD 3662**Interactive Animation***2 cl hrs, 2 lab hrs, 3 cr*

Vector-based animation and interactivity are important presentation tools for engaging the user. The goal of this course is to teach the development of time-based animation skills. It will introduce the concepts of the timeline and vector art for use on the World Wide Web using software such as Flash. This course is a prerequisite for the Interactive Art Direction and Interactive Interface Design courses.

Prerequisite: COMD 2450

COMD 3663**Dynamic Web I: Web 2.0***2 cl hrs, 2 lab hrs, 3 cr*

Websites become alive and powerful as students incorporate dynamic features. These features enable

personalization, and adaptable content. This course covers the implementation of rich user interfaces via client-side scripting. Emphasis will be placed on Javascript techniques such as manipulating the DOM and CSS with Javascript, and using data services via AJAX.

Prerequisite: COMD 3551

COMD 3708**Game Design Concepts II***2 cl hrs, 2 lab hrs, 3 cr*

This course is designed to apply game design theory (MDA), learned in the previous course, to the development of interactive video games. Students will explore basic programming concepts, scripting techniques, and drag 'n drop configurable scripting to create game dynamics. Students will use a simple 2D game engine, such as Game Maker, to design and develop video games. Students will publish video games in mobile and web formats such as: iOS, Android and HTML5.

Prerequisite: COMD 3508, COMD 3540

COMD 3712**Topics in Packaging Design***3cl hrs, 3 credits*

A comprehensive course dealing with good design from initial concept and structural design to printed piece and display in the marketplace. Packaging and its historical perspective; packaging as component of advertising campaigns and corporate identity programs; materials and printing methods; truth in packaging, FDA restrictions. American packaging in various industries is compared with international packaging.

Prerequisite: COMD 2412

COMD 3740**3-Dimensional Animation and Modeling II***2 cl hrs, 2 lab hrs, 3 cr*

An intermediate course in computer 3D modeling, rendering and animation using the Maya software environment. Students learn tools and techniques to advance their proficiency. While exploring 3D design aesthetics, the course emphasizes the practical and technical features of the software.

Prerequisite: COMD 3540, COMD 3640

COMD 3808**3-Dimensional Game Graphics***2 cl hrs, 2 lab hrs, 3 cr*

In this course students will design and develop 3D graphics for use in level designs of games in engines such as Unity or Unreal. While focusing on digital 3D environment design aesthetics and content creation, the course will expose students to technical and practical

features of creating 3D game levels for production. Students will be introduced to real-time graphic concepts and will explore setting lighting, materials and simple physics in a game engine.

Prerequisite: COMD 3508, COMD 3640

COMD 4611**Publication Design***2 cl hrs, 2 lab hrs, 3 cr*

Principles and practice of publication design. Analysis, research and design of the contemporary multi-page publication. Creative assignments leading to the design and production of a newspaper and magazine. Integration of design and production in the computer laboratory using software such as QuarkXpress, Adobe Photoshop and Adobe Illustrator.

Prerequisite: COMD 2427

Equivalent to old course ADV 4700

COMD 4640**3-Dimensional Animation and Modeling III***2 cl hrs, 2 lab hrs, 3 cr*

This is an advanced course in computer 3D modeling, rendering and animation using the Autodesk: Maya & Mudbox software environments. Students will learn advanced techniques for building models and scenes, animating characters, and rendering with complex surfaces. While exploring 3D design aesthetics, the course emphasizes the practical and technical features of the software. Students gain familiarity with advanced modeling techniques, complex surfaces, character animation, and modeling for games with high/low resolution polygons and normal mapping.

Prerequisite: COMD 3740

COMD 4701**The Design Team***2 cl hr, 2 lab hrs, 3 cr*

Working individually or in teams, students consult with a variety of clients on the design and production of logos, posters, advertising campaigns, brochures and other promotional materials. Students are responsible for collecting research, conducting meetings, making presentations and following client guidelines. The role of deadlines and budgets is stressed. Students are expected to be involved in all phases of production. Coordinated with CDMG 4700, Project Management II. Course offered spring, summer and fall semesters.

Prerequisite: COMD 3551 or COMD 3600 or COMD 3601 or COMD 3613 or COMD 3630 or COMD 3641

COMD 4711
Desktop Publication Design II

2 cl hrs, 2 lab hrs, 3 cr

A continuation of COMD 4611. Design principles and practice of publication design. Analysis, research and design of the contemporary multi-page publication. Creative assignments leading to the design and production of annual reports and direct mail catalogs. Integration of design and production in the computer laboratory using software such as QuarkXpress, Adobe Photoshop and Adobe Illustrator.

Prerequisite: COMD 3600 or COMD 3601, COMD 4611

COMD 4713
Advanced Illustration

3 cl hrs, 3 cr

This course develops students' skills in interpreting a manuscript or story and creating a series of visual images. Students will explore the application of various traditional and digital materials and techniques. Emphasis is placed on unique solutions and perspectives to expand students' imagination and develop a personal viewpoint. Creation of a book dummy will also be explored.

Prerequisite: COMD 3613

COMD 4741
2-Dimensional Animation III

2 cl hrs, 2 lab hrs, 3 cr

In this advanced class, each student has the opportunity to write, produce, direct, and shoot a short film. Students will go through the entire process from storyboards, creating model sheets, animatics, animation roughs, to final color and sound. The class will work in small production crews within a rotating responsibility system in order to help fellow students complete individual projects. Upon completing the course each student will have produced a two minute short film for their portfolio.

Prerequisite: COMD 3641

COMD 4762
Interactive Interface Design

2 cl hrs, 2 lab hrs, 3 cr

Continuation of the development of skills learned in COMD 3662, Interactive Animation. Integrating audio, video, vector animation, and interactive components is a powerful way to engage users of the web. To effectively control these elements, students will develop competence with Actionsript. Students will learn to execute rich media content for the web.

Prerequisite: COMD 3662 or COMD 3663

COMD 4763
Dynamic Web II

2 cl hrs, 2 lab hrs, 3 cr

Building on dynamic web interface tools learned in COMD 3663, Dynamic Web I, students will learn to use server-side technologies that enable them to build richer and more fulfilling user experiences. The course will focus on the use of PHP and MySQL as server-side technologies

Prerequisite: COMD 3551

COMD 4764
Design for Mobile Devices

2 cl hrs, 2 lab hrs, 3 cr

Mobile devices are a quickly emerging platform with unique design challenges. User interface elements must be concise, light, functional and adaptive to the capabilities of the device. This course will examine changing standards, and emerging best practices. Emphasis will be on CSS2, CSS3, XHTML, emulators, mobile devices such as smartphones.

Prerequisite: COMD 3551

COMD 4801
The Portfolio

2 cl hrs, 2 lab hrs, 3 cr

Development of each student's strategy for entering the design profession. Cumulative work is critiqued by faculty and professional advisors. Students edit and refine their portfolios to meet professional standards and add materials as needed. The development of individual promotion pieces, resume writing, job search and interviewing skills are emphasized.

Prerequisites: COMD 4701;

Corequisite: COMD 4830

Equivalent to old course ADV 4800

COMD 4830
Senior Project

1 cl hr, minimum 6 independent study hrs, 3 cr

Students work with individual faculty to develop and complete a semester project for presentation. Assignments may include corporate identity programs, public service advertising campaigns, design and illustration of a children's book, redesign of a magazine.

Prerequisites: COMD 4701;

Corequisite: COMD 4801

COMD 4843
Career Strategies for Animation

2 cl hrs, 2 lab hrs, 3 cr

This course will familiarize students with the animation industry in New York, as well as nationally and internationally. Students will learn how to market their skills and their films by creating personalized portfolios, reels, resumes and mailers. During the

semester lecturers from the industry will discuss opportunities in the field of animation. Focus is on self-promotion, how to market yourself, and obtaining employment in the animation industry.

Prerequisite: COMD 3642

COMD 4860
Streaming Media for the Web

2 cl hrs, 2 lab hrs, 3 cr

This advanced course facilitates the creative use of the audio and video technologies for the Web. Students are encouraged to develop prototypes or projects for commercial, artistic, journalistic, personal or documentary purposes. The course assignments include conceptual development, production assignments, discussions and critiques. Students learn skills to tackle all stages of streaming media processes, and they acquire a discipline of thought that encourages planning both for "live" and "on-demand" streaming.

Prerequisite: COMD 3652 or

department approval

COMD 2900
Internship in Advertising Design

AAS degree

2 cl hrs, 120 field hrs/semester, 3 cr

Assignment to field work/study situations of approximately eight to ten hours per week at one of the following: advertising agency, graphic design studio, corporate communications design office, publishing art department, computer graphics design studio, photography or illustration studio. Each student keeps a log/journal to be shared in group seminars. Supervision is by faculty and by the job supervisor.

Prerequisites: COMD 2300, COMD 2427

COMD 4900
Internship in Communication Design

BTech degree

2 cl hrs, 120 field hrs/semester, 3 cr

Assignment to fieldwork/study situations of approximately eight to ten hours per week at an internship site approved by the department Internship Director: an advertising agency, graphic design firm, corporate design office, publications art department, photography or illustration studio, TV or multimedia production company. Each student keeps a log/journal to be shared in group seminars. Supervision is by faculty and by the supervisor at the internship site. Internships may be undertaken during the fall, spring or summer.

Pre- or corequisites: COMD 4701

Course offered spring, summer and fall semesters.

CDMG 1111
Digital Media Foundations

1 cl hr, 2 lab hrs, 2 cr

Introduces students to core technical concepts underlying all digital media. Students work with a variety of software, incorporating the scientific principles discussed during lecture, and explore pertinent industry resources. One field trip is an integral part of the course so students can witness first-hand professional work in an artistic or commercial setting.

Prerequisite: CUNY proficiency in reading, writing and mathematics or ENG 092R and ENG 092W, as required

CDMG 1150
Office Applications

2 cl hrs, 2 lab hrs, 3 cr

Orientation and operating procedures as practiced in the visual communications industry by managers on a computer operating system. Proper system terminology, equipment and a working knowledge of: word processing, spreadsheets, database and presentation applications for production management and customer service. Analysis and application of sets of data as practiced in the industry.

Corequisites: ENG 092R, ENG 092W, or CUNY proficiency in reading, writing and mathematics

CDMG 1230
Print Technologies

2 cl hrs, 2 lab hrs, 3 cr

This in-depth examination of printing gives the students an overview of print within society from historical and technical perspectives. Lectures are coupled with hands-on press experiences, culminating in the production of printed projects utilizing relevant equipment. Traditional print formats, procedures and terminologies are covered and contextualized by lectures, projects, and discussions.

Prerequisite: CUNY proficiency in reading, writing and mathematics or ENG 092R and ENG 092W

CDMG 2300
Cross Media Color Analysis

1 cl hr, 2 lab hrs, 2 cr

Fundamentals and theoretical aspects of color as used in commercial applications in communication media: offset and digital print, photography and web/mobile screen. Study of terms, measurements, gamuts, controls, industry standards, and calibration to ensure reliable and high quality results for all output media.

Prerequisites: COMD 1167, CDMG 1111

CDMG 2303
Content Delivery

2 cl hrs, 2 lab hrs, 3 cr

This course develops skills for print and screen media page assembly with hands-on creation of layouts and documents using industry standard software such as InDesign. Focus is on planning, analyzing and preparing elements for use in all types of communication outlets through the creation of projects using templates and font libraries. Media production is addressed from throughput to file export.

Prerequisites: COMD 1167, COMD 1162

CDMG 2316
Advanced Image Editing

2 cl hrs, 2 lab hrs, 3 cr

An advanced imaging course that continues to develop the ability to capture, color correct, and retouch bitmapped images. Students learn how digital cameras and high-end scanners capture images and how to deliver optimized bitmap files. Students are exposed to professional techniques for making corrections and altering pictures to match a client's instructions, using software such as Adobe Photoshop. The course also introduces professional photography processing and database software such as Adobe Lightroom, and Phase One Capture One.

Prerequisite: COMD 1260; Corequisite: CDMG 2300

Equivalent to old course GRA 2317

CDMG 2317
Production Cost Management

2 cl hrs, 2 lab hrs, 3 cr

A comprehensive study of estimating techniques used in production management using industry-standard estimating software from pre-media to postpress.

Prerequisite: CDMG 1150; Corequisite: CDMG 2303

CDMG 2406
Project Management I

2 cl hrs, 2 lab hrs, 3 cr

An overview of the core competencies required of visual communications project managers to realize media projects to the professional standards required for the end product. Students craft requests for proposals (RFPs), create schedules and budgets, while learning procedures for project monitoring and reporting using project management software during labs. Students hone collaboration skills through a studio budget project and classroom presentations.

Prerequisites: CDMG 2303, CDMG 2317

CDMG 2414
Media Presentations

2 cl hrs, 2 lab hrs, 3 cr

Focuses on analyzing information and developing appropriate presentations. Students work on writing and reading intensive projects that require the visualization of data and explore appropriate outcomes for effective communication. Students integrate text, graphics, layout, simple animation and other elements through the use of industry standard software, such as Microsoft PowerPoint, Macintosh Keynote and Adobe Acrobat.

Prerequisites: CDMG 1111, COMD 1167
Equivalent to old course GRA 2412

CDMG 2901
Career Development

2 cl hrs, 2 lab hrs, 3 cr

Prepares communication design management students with the fundamentals of the job-search process in an evolving industry that demands an adaptable workforce. Students learn how to assess their talents, design a job-search marketing plan, strengthen resume and cover letter writing skills, and develop their promotional materials into one cohesive visual package. Topics of discussion include networking interviewing techniques, and how to approach potential employers, recruiters and employment agencies.

Prerequisite: CDMG 2406 or department approval required
Equivalent to old course GRA 2900

CDMG 3500
Digital Quality Assurance

2 cl hrs, 2 lab hrs, 3 cr

Focuses on current industry terminology, workflows and software for ensuring that digital files are rendered accurately for a variety of content delivery methods. Students analyze client-provided files and synthesize skills from previous courses to create their own static and interactive PDFs for printing and electronic distribution. Project assignments, including an oral presentation, cultivate communication skills required for working with clients, vendors and fellow team members in professional settings.

Prerequisite: CDMG 2303

CDMG 3532
Print Production for Designers

2 cl hrs, 2 lab hrs, 3 cr

This course focuses on current print production procedures. The class will examine a variety of finished print materials including books, magazines, posters, folders and packaging. Topics include print media specifications, digital prepress, page imposition, proofing, type technology, preparation of color files. Case studies, problem-solving exercises and

software such as QuarkXpress, Adobe Illustrator and Photoshop are used to demonstrate production techniques.

Prerequisite: COMD 2300

CDMG 3607
Digital Asset Management

2 cl hrs, 2 lab hrs, 3 cr

Explores the economic benefits of sound Digital Asset Management practices for all businesses. Students learn the importance of metadata and develop a working knowledge of the hardware and software components of a DAM system. Students create their own digital archive and conduct research in the area of intellectual property, culminating in a research paper.

Prerequisites: CDMG 2317, CDMG 2406

CDMG 3611
Vector Art Editing

2 cl hrs, 2 lab hrs, 3 cr

Advanced techniques in creating and manipulating vector graphics for illustration and production. Topics of discussion include insights on the creative process through a detailed look at how to add dimension, texture, and color to line art. Technical differences in designing for print vs. the screen are covered. Students use professional software tools such as Adobe Illustrator on the Macintosh operating system.

Prerequisite: COMD 1162

CDMG 3615
Packaging Technology I

2 cl hrs, 2 lab hrs, 3 cr

Explains and demonstrates the technology of enclosing or protecting products for distribution, storage, sale and use. Topics include the design, evaluation, production and manufacturing processes that shape the packaging industry. Digital mechanicals, virtual 3D proofing, pre- and post-production work flow and file management of class projects are developed, organized and archived utilizing professional project management via relevant industry software applications.

Prerequisite: CDMG 2406 or COMD 2412 or department permission

CDMG 3715
Packaging Technology II

2 cl hrs, 2 lab hrs, 3 cr

This advanced course investigates the design, production and manufacturing processes shaping the packaging industry via the role of the packaging brand manager. Students design, document and brand-manage a 3D package on its path from conception to completion over the course of the semester.

Class projects are organized and archived utilizing professional project

management software. 3D prototyping software and hardware are used to form each student's container.

Prerequisite: CDMG 3615 or department permission

CDMG 4600
Topics in Media Management

2 cl hrs, 2 lab hrs, 3 cr

In this course, current media management topics will be presented as a series of lectures and projects strongly linked to industry contact. Instructors will guide guest speakers and initiate field study to educate students on current issues in media communications. Throughput problems or industry challenges are explored and solved by methods including: research projects; financial, resource and contact analysis. Students focus on expanding their knowledge base to include sustainability principles in communication technology, as well as legal and ethical issues. This course applies theoretical concepts to production issues that reflect trends in an integrated communications.

Prerequisite: CDMG 3607

CDMG 4700
Project Management II

2 cl hrs, 2 lab hrs, 3 cr

This study of media management decisions uses workflow analysis engineering models and project management software to focus on managing production workflows while working alongside the Design Team (COMD 4701) class—both physically and conceptually. Theoretical concepts to tangible print, screen and exhibition production projects are realized using predictable, reliable and profitable processes.

Prerequisite: CDMG 3500

Equivalent to old course GRA 4715

CDMG 4817
Cost Control Systems Management

3 cl hrs, 3 cr

A study of cost control systems that provide effective management decisions in the communications industry. Students develop management strategies, management analysis, competitive cost and inventory controls, and sustainable strategies using estimating platforms central to this study.

Prerequisite: CDMG 3500

CDMG 4830
Senior Project

2 cl hrs, 2 lab hrs, 3 cr

In this course, students, working with individual faculty, will develop and complete a semester project for presentation based on issues facing

graphic arts production managers.
Assignments may include projects in
advertising, printing or publishing.
This course is writing intensive.
Prerequisite: CDMG 4700

CDMG 4900
Media Management
Internship

2 cl hrs, 120 field hrs/semester, 3 cr
Assignment to find field work/study
of approximately eight to ten hours
per week at a media-management
related internship site approved
by the department internship
director. A portion of the class is
devoted to sharing experiences with
classmates through a blog and an
oral presentation. Students work on
assessing their talents, updating their
resumes and promoting themselves
and their work through social media.
Prerequisites: CDMG 2901 or
department approval

Computer Engineering Technology

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PROGRAMS:

Electromechanical Engineering Technology/AAS
Computer Engineering Technology/BTech

FACULTY:

Professor: Razukas
Associate Professors: Blank, Carranza, Jang, Zia
Assistant Professors: Kwon, Li, Ma, Mendoza, Morton, Reyes-Alamo, Xu, Wang
Lecturer: Armstrong

Senior CLT: Carrington
CLT: Zaratan

Associate in Applied Science in ELECTROMECHANICAL ENGINEERING TECHNOLOGY

The Electromechanical Engineering Technology program, the only one of its kind within the CUNY system, was developed in response to the need to prepare competent technicians who had the special skills needed by the computer industry. It is multidisciplinary in nature in that students are taught the fundamentals of electrical and mechanical technology, computer hardware, software, data communications and networking. It prepares students to diagnose and analyze electromechanical problems associated with the development, performance and servicing of computers and computer-based equipment, complex electromechanical industrial equipment and systems, biomedical instrumentation and robotics. Fifty percent of the curriculum is devoted to individualized laboratory instruction using state-of-the-art equipment. Students build their own devices for take-home experimentation and will assemble, program and test their own IBM-compatible computer system. Students can earn the associate degree and then continue, at City Tech for the bachelor of technology (BTech) degree in Computer Engineering Technology. Students will be expected to purchase an IBM-compatible computer by the third semester of the associate program. Specific information on the models currently used may be obtained from the department. Graduates qualify for the following occupational fields: computer system maintenance, business machines, data processing equipment, electromechanical systems, production assembly, biomedical instrumentation, and robotics technology.

Manufacturers and users of computers and electromechanical equipment are potential employers of graduates. Among the

employers of the graduates of this program are Con Edison, General Electric (GE), Verizon, Cable Version, Apple, Logic Control, Lutron Electronics, JetBlue, MTA, NYC Transit, NYPD, and the elevator industry.

Accreditation

The program is accredited by the Engineering Technology Accreditation Commission of ABET, <http://www.abet.org/>.

To accomplish its mission, the CET department has established the following Program Educational Objectives (PEOs) and Student Outcomes (SOs) for the AAS in Electromechanical Engineering Technology.

Program Educational Objectives

1. Graduates of the EMT program are expected to be employed as engineering technicians or the equivalent in positions beyond the entry-level for which this program has prepared them. They will be expected to practice their profession either as individual contributors or as members of a team in a competent and efficient manner.
2. Graduates of the EMT program who desire to continue their education will pursue the path towards a bachelor's degree in a related undergraduate program. This may be on a part-time basis, while employed, or it may be on a full-time basis.
3. Graduates of the EMT program might become members of a professional society related to their employment or field of study. They will be committed to continue as lifelong learners and contributors to their discipline, and remain ready to act as the society needs them.

Student Outcomes

General (Adopted from ETAC/ABET Criterion 3)

Students demonstrate:

- a) An ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;
- b) An ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;
- c) An ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;
- d) An ability to function effectively as a member of a technical team;
- e) An ability to identify, analyze, and solve narrowly defined engineering technology problems;
- f) An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
- g) An understanding of the need for and an ability to engage in self-directed continuing professional development;
- h) An understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and
- i) A commitment to quality, timeliness, and continuous improvement.

Discipline Specific

(Adopted from ETAC / ABET Program Criteria)

Students demonstrate knowledge and hands on competence in:

- i) Use computer-aided drafting or design tools to prepare graphical representations of electromechanical systems.
- ii) Use circuit analysis, analog and digital electronics, basic instrumentation, and computers to aid in the characterization, analysis, and troubleshooting of electromechanical systems.
- iii) Use statics, dynamics (or applied mechanics), strength of materials, engineering materials, engineering standards, and manufacturing processes to aid in the characterization, analysis, and troubleshooting of electromechanical systems.

[Click here for annual enrollment and graduation data](#)

GENERAL EDUCATION COMMON CORE¹

28-30 CREDITS

I – REQUIRED CORE² (4 COURSES, 14-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1375 or higher ³	Precalculus	4
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Life and Physical Sciences (1 course, 4-5 credits)

PHYS 1433	General Physics I: Algebra Based or	4
PHYS 1441	General Physics I: Calculus Based	5

II – FLEXIBLE CORE (4 COURSES, 14-15 CREDITS)

Students must take courses as specified in Scientific World area and select one approved course from each of any other two areas.

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Individual and Society

Any Approved Course

Creative Expression

Any Approved Course

Scientific World

MAT 1475 or higher	Calculus	4
PHYS 1434	General Physics II: Algebra Based or	4
PHYS 1442	General Physics II: Calculus Based	5

Writing Intensive Requirement⁴

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

36 CREDITS

EMT 1111	Logic and Problem-Solving	1
EMT 1120	Technical Graphics	1
EMT 1130	Electromechanical Manufacturing Laboratory	1
EMT 1150	Electrical Circuits	5
EMT 1220	Mechanisms	4
EMT 1250	Fundamentals of Digital Systems	4
EMT 1255	Electronics	4
EMT 2320	Advanced Mechanisms	5
EMT 2370	Computer Hardware Systems	2
EMT 2390L	Operating Systems Laboratory	1
EMT 2455	Data Communications	2
EMT 2461	Electromechanical Systems Software Interface	2
EMT 2480L	Electromechanical Systems Laboratory	1
	Technical Elective	3
EMT 2410	C/C++ programming for Embedded Systems or	
CST 2403	Intro C++ Programming Language I	
MAT 1375 or higher	Precalculus	Met as GenEd
PHYS 1433	General Physics I: Algebra Based or	
PHYS 1441	General Physics I: Calculus Based	Met as GenEd
PHYS 1434	General Physics II: Algebra Based or	
PHYS 1442	General Physics II: Calculus Based	Met as GenEd
MAT 1475 or higher	Calculus	Met as GenEd

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 36

TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS 28-30

TOTAL CREDITS REQUIRED FOR THE DEGREE 64-66

¹ Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.

² Specific courses listed are degree requirements that also meet CUNY Pathways general education requirements in that category.

³ Students without the requisite math background to enter MAT 1375 will be required to take MAT 1175 and/or MAT 1275 in preparation. This will increase the number of required credits for the degree by 4-8 credits.

⁴ A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

Curriculum by Semester

For students earning an associate in applied science (AAS) degree in Electromechanical Engineering Technology.

FIRST SEMESTER		CREDITS
EMT 1111	Logic and Problem-Solving	1
EMT 1120	Technical Graphics	1
EMT 1130	Electromechanical Manufacturing Laboratory	1
EMT 1150	Electrical Circuits	5
MAT 1375 ¹	Precalculus	4
ENG 1101	English Composition I	3
Subtotal		15
SECOND SEMESTER		
EMT 1220	Mechanisms	4
EMT 1250	Fundamentals of Digital Systems	4
EMT 1255	Electronics	4
PHYS 1433	General Physics I: Algebra Based	4
PHYS 1441	General Physics I: Calculus Based	5
Subtotal		16-17
THIRD SEMESTER		
EMT 2320	Advanced Mechanisms	5
EMT 2370	Computer Hardware Systems	2
EMT 2390L	Operating Systems Lab	1
MAT 1475	Calculus I	4
ENG 1121	English Composition II	3
GenEd Elective	Flexible Core	3
Subtotal		18
FOURTH SEMESTER		
EMT 2455	Data Communications	2
EMT 2461	Electromechanical Systems: Software Interface	2
EMT 2480L	Electromechanical Systems Lab	1
PHYS 1434	General Physics II: Algebra Based	4
PHYS 1442	General Physics II: Calculus Based	5
GenEd Elective	Flexible Core	3
Elective	EMT 2410 or CST 2403	3
Subtotal		15-16
TOTAL CREDITS REQUIRED FOR THE DEGREE		64-66

¹ Students without the requisite math background for MAT 1375 will be required to take MAT 1175 and/or MAT 1275 in preparation. This will increase the number of credits required for the degree by up to eight (8).

² Choose from EMT 2410 C/C++ for Embedded Systems or CST 2403 Intro C++ Programming Language I

Bachelor of Technology in COMPUTER ENGINEERING TECHNOLOGY

There are many ways a student can enter the bachelor of technology program in Computer Engineering Technology. Students may enter the program as freshmen if they meet the general College criteria. These students will follow the electromechanical engineering technology AAS curriculum for the first 64 credits and may earn the AAS along the way. Students may transfer in from the City Tech AAS programs in electrical engineering technology or mechanical engineering technology areas before or after completing the AAS degree in these fields. Students may enter from other programs either here at City Tech or from other colleges if they meet College criteria for transfer admission. Students with questions are advised to consult the Admissions Office. It is not necessary to have earned an associate degree in electromechanical engineering technology, or to have earned an associate degree at all. Transcripts of entering students will be evaluated to determine the courses they must complete for the bachelor of technology degree. The department chair may be called for further information.

The courses in the baccalaureate program build upon the knowledge gained at the AAS level, with an emphasis on computers, computer-controlled systems and networking. More emphasis is placed upon independent thinking and analysis. In addition to advanced coverage of computers and electronics, the curriculum includes programming and advanced mathematics. A wide field of technical electives including topics from computer engineering technology, electrical and telecommunications engineering technology, mechanical engineering technology, computer programming and design, give students considerable latitude to specialize in their own area of interest.

Important Note: The number of credits and the courses required for the BTech degree in computer engineering technology will be affected by the contents of the student's AAS preparation. The list below is for AAS graduates of the College's Electromechanical Engineering Technology program. Following this are additional requirements for students from a number of other majors. For transfer credit and requirements for majors not listed, please consult the Department.

Accreditation

The program is accredited by the Engineering Technology Accreditation Commission of ABET, <http://www.abet.org/>.

To accomplish its mission, the CET department has established the following Program Educational Objectives (PEOs) and Student Outcomes (SOs) for the Computer Engineering Technology curriculum (BTech degree).

Program Educational Objectives

1. Graduates of the CET program are expected to be employed, as engineering technologists or the equivalent, in positions beyond the entry-level for which this program has prepared them. They will be expected to practice their profession either as individual contributors or as members of a team in a competent and efficient manner.
2. Graduates of the CET program who desire to continue their education will pursue the path towards a master's degree in a related graduate program. This may be on a part-time basis, while employed, or it may be on a full-time basis.

3. Graduates of the CET program might become members of a professional society related to their employment or field of study. They will be committed to continue as lifelong learners and contributors to their discipline, and remain prepared to respond to the dynamics of the society.

Student Outcomes

General (Adopted from ETAC/ABET Criterion 3)

Students demonstrate:

- an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;
- an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
- an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;
- an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;
- an ability to function effectively as a member or leader on a technical team;
- an ability to identify, analyze, and solve broadly-defined engineering technology problems;
- an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
- an understanding of the need for and an ability to engage in self-directed continuing professional development;
- an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
- a knowledge of the impact of engineering technology solutions in a societal and global context; and
- a commitment to quality, timeliness, and continuous improvement.

Discipline Specific

(Adopted from ETAC/ABET Program Criteria)

Students demonstrate knowledge and hands on competence in:

- the ability to analyze, design, and implement hardware and software computer systems.
- the ability to apply project management techniques to computer systems.
- the ability to utilize statistics/probability, transform methods, discrete mathematics, or applied differential equations in support of computer systems and networks.

[Click here for annual enrollment and graduation data](#)

Progression and Graduation

For progression in and graduation from the Computer Engineering Technology (CEB BTech) program, a minimum grade of 'C' is required in the following courses in the major: MAT 1575, MAT 2680, CET 3625.

Program Completion and a Path to Professional Engineering License

Upon graduation, students automatically qualify for direct admission to the National Council of Examiners for Engineering and Surveying (NCEES) Fundamentals of Engineering Examination, a viable path to a Professional Engineering license. The NCEES website is <http://ncees.org/>.

GENERAL EDUCATION COMMON CORE

46-48 CREDITS

I – REQUIRED CORE¹ (4 COURSES, 14-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101*	English Composition I	3
ENG 1121*	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1375 or higher *.2	Precalculus	4
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Life and Physical Sciences (1 course, 4-5 credits)

PHYS 1433*	General Physics I: Algebra Based or	4
PHYS 1441*	General Physics I: Calculus Based	5

II – FLEXIBLE CORE (6 COURSES, 20-21 CREDITS)

Select an approved course from each of the following four areas of the Flexible Core

World Cultures and Global Issues

Any Approved Course	3
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US Experience in its Diversity

Any Approved Course	3
---------------------	---

Individual and Society

Any Approved Course	3
---------------------	---

Creative Expression

Any Approved Course	3
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Scientific World

PHYS 1434*	General Physics II: Algebra Based or	4
PHYS 1442*	General Physics II: Calculus Based	5
One additional course from any group		
MAT 1475 or higher*	Calculus	4

III – COLLEGE OPTION REQUIREMENTS³ (12 CREDITS)

- One course in Speech/Oral Communication⁴
COM 1330 Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course
Any Approved Course 3
- Additional liberal arts credits to reach a minimum of 42 credits in general education.

In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language.

MAT 2580	Introduction to Linear Algebra	3
Any Approved Course		3

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 82 CREDITS

Associate-Level Degree Requirements (36 credits)

Associate degree in EMT, EET/TCET or MECH or an acceptable equivalent

Baccalaureate-Level Degree Requirements (46 credits)

CET 3510	Microcomputer Systems Technology	4
CET 3525	Electrical Networks (Required only for students with AAS in EMT or MECH)	4
CET 3550	Analog and Digital Electronics (Required only for students with AAS in MECH)	4
CET 3615	Instrumentation and Data Acquisition	4
CET 3625	Applied Analysis Laboratory	1
CET 3640	Software for Computer Control	3
CET 4705	Component and Subsystem Design I	2
CET 4711	Computer Controlled System Design I	2
CET 4762	Electromechanical Devices (Required only of students with AAS in EET/TCET)	4
CET 4773	Inter-networking Technology	4
CET 4805	Component and Subsystem Design II	2
CET 4811	Computer Controlled System Design	2
CET 4864	Feedback Controlled Systems	4

Technical Elective I 4 cr

(Required only for students with an AAS in EMT, EET/TCET)

CET 4900 series, CST 3500 or higher, or TCET 3100 or higher, with department permission.

Technical Elective II or Internship 3 cr

EMT 2410 or CST 2403 (or an approved equivalent)

(required only for students with an AAS in MECH)

Choose from CET 3910, CET 3572, CET 3672, CET 4772, CET 4872, CET 4900 series, CST 3500 or higher, or TCET 3100 or higher, with department permission.

MAT 1375 or higher	Precalculus	Met as GenEd
MAT 1475 or higher	Calculus	Met as GenEd
MAT 1575	Calculus II	4
MAT 2580	Introduction to Linear Algebra	Met as GenEd
MAT 2680	Differential Equations	3
PHYS 1433	General Physics I: Algebra Based or	
PHYS 1441	General Physics I: Calculus Based	Met as GenEd
PHYS 1434	General Physics II: Algebra Based or	
PHYS 1442	General Physics II: Calculus Based	Met as GenEd

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 82

TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS 46-48

TOTAL CREDITS REQUIRED FOR THE DEGREE 128-130

* Courses required for associate degree.

1 Specific courses listed are degree requirements that also meet CUNY Pathways general education requirements in that category.

2 Students without the requisite math background to enter MAT 1375 will be required to take MAT 1175 and/or MAT 1275 in preparation. This will increase the number of required credits for the degree by 4-8 credits.

3 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

4 Students who have already met this requirement at the associate level may select another liberal arts and science course instead.

For Students Entering with an AAS

Students entering with an AAS in Electrical Engineering Technology or Telecommunications Engineering Technology or an equivalent degree must also complete MAT 1375 Precalculus, and CET 4762 Electromechanical Devices, but are not required to take CET 3525 Electrical Networks and CET 3550 Analog and Digital Electronics.

Students entering with an AAS in Mechanical Engineering Technology or an equivalent degree must also complete CST 2403 Introductory C++ Programming Language I or EMT 2410 C/C++ Programming for Embedded Systems, and CET 3550 Analog and Digital Electronics, but are not required to take the two technical electives.

The College will grant a bachelor of technology (BTech) degree with a major in Computer Engineering Technology upon satisfactory completion of an AAS degree in any of the following fields: electromechanical engineering technology, electrical and telecommunications engineering technology, mechanical engineering technology OR AN ACCEPTABLE EQUIVALENT, and the required 64 credits listed above.

Students with an AAS in Electrical Engineering Technology

For upper-division bachelor of technology in Computer Engineering Technology students with an AAS in Electrical Engineering Technology.

Students with an AAS in Mechanical Engineering Technology

For upper-division bachelor of technology in Computer Engineering Technology students with an AAS in Mechanical Engineering Technology.

Curriculum by Semester

FIFTH SEMESTER		CREDITS
MAT 1575	Calculus II	4
CET 3510	Microcomputer Systems Technology	4
COM 1330	Public Speaking or higher	3
GenEd Elective	Flexible Core	3
College Option	Interdisciplinary Course	3
Subtotal		17
SIXTH SEMESTER		
MAT 2580	Introduction to Linear Algebra	3
MAT 2680	Differential Equations	3
CET 3615	Instrumentation and Data Acquisition	4
CET 3625	Applied Analysis Laboratory	1
CET 3640	Software for Computer Control	3
GenEd Elective	Flexible Core	3
Subtotal		17
SEVENTH SEMESTER		
CET 4705	Component and Subsystem Design I	2
CET 4711	Computer-Controlled Systems Design I	2
CET 4762	Electromechanical Devices	4
CET 4773	Inter-networking Technology	4
CET	Technical Elective	4
Subtotal		16
EIGHTH SEMESTER		
CET 4805	Component and Subsystem Design II	2
CET 4811	Computer-Controlled Systems Design II	2
CET 4864	Feedback-Controlled Systems	4
Elective	Technical Elective or Internship	3
College Option	Advanced Liberal Arts Course	3
Subtotal		14
TOTAL CREDITS REQUIRED FOR THE DEGREE		64

Curriculum by Semester

FIFTH SEMESTER		CREDITS
EMT 2410	C/C++ for Embedded Systems or Intro C++ Programming Language I	3
CST 2403	Calculus II	4
MAT 1575	Electrical Networks	4
CET 3525	Analog and Digital Electronics	4
Subtotal		15
SIXTH SEMESTER		
MAT 2680	Differential Equations	3
CET 3510	Microcomputer Systems Tech	4
CET 3615	Instrumentation and Data Acquisition	4
CET 3625	Applied Analysis Laboratory	1
COM 1330	Public Speaking or higher	3
GenEd Elective	Flexible Core	3
Subtotal		18
SEVENTH SEMESTER		
MAT 2580	Introduction to Linear Algebra	3
CET 3640	Software for Computer Control	3
CET 4705	Component and Subsystem Design I	2
CET 4711	Computer-Controlled Systems Design I	2
CET 4773	Inter-networking Technology	4
GenEd Elective	Flexible Core	3
Subtotal		17
EIGHTH SEMESTER		
CET 4805	Component and Subsystem Design II	2
CET 4811	Computer Controlled Systems Design II	2
CET 4864	Feedback Control Systems	4
College Option	Interdisciplinary Course	3
College Option	Advanced Liberal Arts Course	3
Subtotal		14
TOTAL CREDITS REQUIRED FOR THE DEGREE		64

Students with an AAS in Electromechanical Engineering Technology

For upper-division bachelor of technology in Computer Engineering Technology students with an AAS in Electromechanical Engineering Technology.

Curriculum by Semester

FIFTH SEMESTER		CREDITS
MAT 1575	Calculus II	4
CET 3510	Microcomputer Systems Tech	4
CET 3525	Electrical Networks	4
COM 1330	Public Speaking or higher	3
Subtotal		15
SIXTH SEMESTER		
MAT 2580	Introduction to Linear Algebra	3
MAT 2680	Differential Equations	3
CET 3615	Instrumentation and Data Acquisition	4
CET 3625	Applied Analysis Laboratory	1
CET 3640	Software for Computer Control	3
GenEd Elective	Flexible Core	3
Subtotal		17

SEVENTH SEMESTER

CET 4705	Component and Subsystem Design I	2
CET 4711	Computer-Controlled Systems Design I	2
CET 4773	Inter-networking Technology	4
CET	Technical Elective	4
GenEd Elective	Flexible Core	3
College Option	Interdisciplinary Course	3

Subtotal 18

EIGHTH SEMESTER

CET 4805	Component and Subsystem Design II	2
CET 4811	Computer-Controlled Systems Design II	2
CET 4864	Feedback Control Systems	4
CET	Technical Elective or Internship	3
College Option	Advanced Liberal Arts Course	3

Subtotal 14

TOTAL CREDITS REQUIRED FOR THE DEGREE 64

Note: This schedule assumes that EMT 2410 or CST 2403 was completed as part of the AAS program.

COURSES:

EMT 1111 Logic and Problem-Solving

2 lab hrs, 1 cr

This course introduces the foundations of problem-solving and computer programming as it is applied to electromechanical engineering technology. It provides a basic understanding of number systems and programming techniques with practical examples implemented in a modern programming language. Concepts are developed through hands-on laboratory exercises.

Prerequisite: CUNY proficiency in mathematics

EMT 1120 Technical Graphics

3 lab hrs, 1 cr

Training in basic orthographic projection and isometric drawing using sketching as a tool. Included are standard symbols and representations used in the electromechanical field, assembly drawings, charts, graphs, electrical and electronic schematics and timing charts. Extensive use of electrical, electronic, mechanical and electromechanical visual aids.

Prerequisite: None

EMT 1130 Electromechanical Manufacturing Lab

3 lab hrs, 1 cr

Students gain insight into selected mechanical and electrical manufacturing processes by constructing their own digital trainer which is used in EMT 1250L to study digital electronics.

Prerequisite: None

EMT 1150 Electrical Circuits

4 cl hrs, 3 lab hrs 5 cr

Introduction to the basic principles of direct and alternating current circuits. Topics include linear and nonlinear passive components, transient response and phase relationships. Laboratory work is performed both in school and at home (using student-purchased kits). The use of the multi-meter, oscilloscope and frequency generator is introduced; computers are used for problem-solving.

Pre- or corequisites: MAT 1175 or higher, EMT 1120, EMT 1130

EMT 1220 Mechanisms

3 cl hrs, 3 lab hrs, 4 cr

Levers, gears, cams, belts, chains and sprockets, intermittent motions, brakes and clutches. The application of these mechanisms as motion converters and electromechanical energy conversion systems and their displacement, velocity and acceleration. Laboratory study of physical and operational characteristics of mechanical and electromechanical components through the technique of breadboarding. Standard industrial components are used for this purpose.

Prerequisites: EMT 1120, EMT 1130; Pre- or corequisites: MAT 1275 or higher, PHYS 1433 or PHYS 1441

EMT 1240 Introduction to Computer Engineering Technology

3 cl hrs, 3 lab hrs, 4 cr

An introduction to basic electrical theory, semiconductor devices, digital electronics and applications. Topics cover key fundamentals of electrical quantities, digital logic and digital computer basics. Hands-on laboratory

experience reinforces classroom topics and provides an opportunity to transfer theory learned in lecture to practical applications. Open only to students at Pathways to Technology Early College High School (P-TECH).
Prerequisite: CST 1100

EMT 1250 Fundamentals of Digital Systems

3 cl hrs, 3 lab hrs, 4 cr

An introduction to digital logic and the basic building blocks used in digital systems. Students learn Boolean algebra and switching functions, logic gates and flip-flops, combinational and sequential logic circuits, memory elements, programmable logic devices, and computer-aided design tools for digital systems design, simulation, and testing. The laboratory provides hands-on experiences through Prototyping Circuit Boards, Programmable Logic (such as FPGAs) Prototyping Boards, and Hardware Description Language (HDL).

Prerequisites: EMT 1111, EMT 1130, EMT 1150

**EMT 1255
Electronics**

3 cl hrs, 3 lab hrs, 4 cr

Non-linear behavior using semiconductor devices from diodes to CMOS IC's. A black-box analysis of amplifiers and other circuits is introduced, as well as basic optical devices. Typical circuits are breadboarded, analyzed and tested in the laboratory. Computer simulations are used for the additional reinforcement of course material.

Pre- or corequisites: EMT 1250, MAT 1375 or higher

**EMT 2320
Advanced Mechanisms**

4 cl hrs, 3 lab hrs 5 cr

Representative components are studied in terms of how basic concepts previously covered are utilized to provide specialized devices that convert signal data to desired movements, motions and forces to perform specific actions. Typical items studied include pneumatics, solenoids, relays, stepping motors and computer peripherals. Applications in writing and reading data and power control are discussed in detail. The student evaluates the performance characteristics and limitations of these devices by constructing and testing breadboard subsystems. The computer disk drive is studied in detail as a representative system.

Prerequisites: EMT 1120, EMT 1220;

Pre- or corequisite: EMT 1255

**EMT 2370
Computer Hardware Systems**

1 cl hr, 2 lab hrs, 2 cr

Computer hardware systems, along with several software concepts, are studied to understand the function and relationship of the CPU, memory and peripheral equipment. Course material is chosen for relevance to industry certification exams such as A+. The peripheral equipment includes monitors, disk drives, scanners and printers. During laboratory exercises, computer systems, with monitor and operating system, are provided for analysis by students working in teams. However, as an option, each student can build, configure, analyze and troubleshoot his or her own IBM PC (or compatible) computer.

Prerequisite: EMT 1250

**EMT 2390L
Operating Systems
Laboratory**

3 lab hrs, 1 cr

Students study the characteristics of operating systems used in IBM systems. They learn how to install the operating system and set it up to control the computer hardware. They also learn to use features of the operating system to manage the computer system.

Pre- or corequisite: EMT 2370

**EMT 2410
C/C++ Programming for
Embedded Systems**

2 cl hrs, 2 lab hrs, 3 cr

Introduction to the basics of C/ C++ programming language with applications to embedded systems. Fundamentals of structured and object-oriented programming in C/C++ and their applications in hardware environments. Students develop projects that highlight the application of C/C++ language in an embedded system.

Prerequisite: EMT 2370

**EMT 2455
Data Communications**

1 cl hr, 2 lab hrs, 2 cr

Fundamentals of data communications and computer networks protocols and standards. It provides a basic understanding of data communication systems with practical examples of communication networks as applied in engineering technology. Study of OSI and TCP/IP models, data transmissions, transmission media, network topologies, network cabling system, IP addressing, TCP/IP suite, local area networks (LANs), wide area networks (WANs), wireless network, and network security. Students carry out experiments using modern hardware and software networking tools.

Prerequisites: EMT 1250, EMT 2370

**EMT 2461
Electromechanical Systems:
Software Interface**

1 cl hr, 2 lab hrs, 2 cr

How computer hardware and electromechanical systems control external devices, both electrically and mechanically. Students build a project to learn the interface of software and hardware for use as a control element.

Prerequisites: EMT 1111, EMT 2370;

Pre- or corequisites: EMT 2455, EMT 2480L, MAT 1475 or higher

**EMT 2480L
Electromechanical Systems
Laboratory**

3 cl hrs, 1 cr

An actual electromechanical system used in biomedical technology, robotics, or a related field is chosen for study. Computer-aided drafting (CAD) is utilized to prepare drawings of one or more selected components. Computer-aided engineering (CAE) techniques are utilized to introduce concepts of applied mechanics and mechanics of materials needed to analyze the selected component(s). A student presentation (written and oral) is required.

Prerequisites: EMT 2320, PHYS 1433 or PHYS 1441, ENG 1101

**CET 3572
Embedded Systems
Fundamentals and
Applications in Robotics**

2 cl hrs, 3 lab hrs, 3 cr

Introduces students in the MECH, CET, and EET programs to the applications of embedded systems in designing basic robotic systems or smart devices. Hands-on design activities help students to build prototypes for various robotic applications.

Prerequisite: GPA of 2.8 or higher and EET students only: EET 3112

Pre- or corequisite: CET students only: CET 3510; MECH students only: MECH 3500

**CET 3510
Microcomputer Systems
Technology**

3 cl hrs, 3 lab hrs, 4 cr

An introduction to microcomputer architecture and the basic concepts used in the Personal Computer (PC). Key features of the PC are explored by writing programs in a high-level language (such as C) to access them. Assembly language programs are utilized to gain insight into machine-level operations. Laboratory exercises support the lecture and are carried out in the context of currently available operating systems.

Prerequisite: previous course in digital electronics; EMT 2410 or CST 2403, MAT 1575 or higher

**CET 3525
Electrical Networks**

3 cl hrs, 3 lab hrs, 4 cr

Applications of principles of electrical circuit analysis to the solution of practical network problems, with emphasis on steady-state AC Circuits. Applications of Kirchoff's Laws, superposition and Thevenin's theorems.

Pre- or corequisite: MAT 1575 with a grade of C or higher

**CET 3550
Analog and Digital Electronics**

3 cl hrs, 3 lab hrs, 4 cr

Concepts of active circuit elements and non-linear behavior. Study of the properties of solid-state components, whether discrete (diodes and transistors) or combined into an integrated circuit (analog or digital). Topics from analog electronics include an overview of common devices, with detailed study of selected amplifier configurations. Topics from digital electronics include Boolean algebra, binary arithmetic and use of logic gates (AND, OR, etc.) to form more complex circuits. Laboratory experiments include practical amplifier applications and frequency-dependent behavior of analog circuits, as well as the use of digital components to construct common devices such as flip-flops, counters and adders.

Pre- or corequisites: MAT 1575 or higher, CET 3525

**CET 3615
Instrumentation and Data
Acquisition**

3 cl hrs, 3 lab hrs, 4 cr

An introduction to the concepts and techniques of instrumentation. Analog and digital techniques are used, taking into account standards, precision, accuracy and sensitivity in the data-acquisition process. Interfacing with mechanical and electronic sensors. The lab emphasizes practical components and system analysis with evaluation of results, and utilizes computer-based data-acquisition systems as well as stand-alone instruments.

Prerequisites: MAT 1575 with a grade of C or higher, CET 3525, PHYS 1434 or PHYS 1442, previous course(s) in analog and digital electronics

**CET 3625
Applied Analysis Lab**

3 lab hrs, 1 cr

Students are introduced to the application of calculus and ordinary differential equations for the modeling and solution of advanced problems in engineering technology. This course is coordinated with MAT 2680 Differential Equations.

Pre- or corequisite: MAT 2680

**CET 3640
Software for Computer
Control**

2 cl hrs, 2 lab hrs, 3 cr

Programming concepts and software development techniques for computer-controlled systems. Laboratory exercises apply these concepts to a variety of systems and devices.

Prerequisites: EMT 2410 or CST 2403; CET 3510

**CET 3672
Actuators and Sensors
Application in Robotics**

2 cl hrs, 3 lab hrs, 3 cr

An elective in the robotic concentration for the MECH, CET, and EET programs for students who want to develop expertise in mechatronic product design and development. Teaches the design of robots and smart devices or systems using various sensor and actuators.

Prerequisite: EET students: EET 3122

Pre- or corequisite: non-EET students: CET 3615 or MECH 3572

**CET 3910
Mechanics of Materials**

3 hrs, 3 cr

Review of principles of statics. Stress and strain, normal stresses, shear, torsion. Stresses on beams and columns. Characteristics of engineering materials: yield and ultimate strength, ductility. Application to selected components of electromechanical systems.

Prerequisites: MAT 1475, with a grade of C or higher, PHYS 1433 or PHYS 1441

CET 4935**Wearable Computing***2 cl hrs, 2 lab hrs, 3 cr*

Introduction to the basics of existing and emerging technologies that can be used for a wearable computing application. Compact and energy efficient computing platforms, mini/micro actuators, wearable sensors, wireless communication technologies, personal area network, body area network, and a variety of wearable computing examples are discussed. Other related topics including electronic textiles, virtual reality and augmented reality are also introduced. Students create prototype wearable computing projects by applying the technologies with an experiment platform.

Prerequisites: For Emerging Media Technology students only MTECH 2230 and MTEC 2280; Pre- or corequisite: CET 4711 or department approval

CET 4705**Component and Subsystem Design I***1 cl hr, 2 rec hrs, 2 cr*

Develops the foundations for performing electrical design in computer engineering technology applications. Typical systems are analyzed mathematically and graphically. Subsystems are designed to meet specific performance criteria. *Prerequisites:* MAT 2680, CET 3625, both with a grade of C or higher, CET 3615, previous course(s) in analog and digital electronics

CET 4711**Computer-Controlled Systems Design I***1 cl hr, 2 rec hrs, 2 cr*

Modern design principles and methodologies. Software tools for systems design including computer-aided design and computer-aided engineering. Students carry out the conceptual design of a complete device or system by integrating hardware and software sub-systems; and learn to use project management tools to manage the design process. *Prerequisites:* CET 3640; Pre- or corequisite: CET 4705

CET 4762**Electromechanical Devices***3 cl hrs, 3 lab hrs, 4 cr*

Elements of spur gears, helical gears, worm gear sets and bevel gears. Design of simple, compound and reverted gear trains. Design of electrical control systems for machines using programmable logic controllers. Analysis of four-bar linkages, fundamentals of synchros and stepping motors. Laboratory experiments coordinate with lecture material.

Prerequisites: CET 3615, MAT 2680 and CET 3625, all with grades of C or higher

CET 4772**Control Systems in Robotics***2 cl hrs, 3 lab hrs, 3 cr*

An elective course in the robotic concentration for the MECH, CET, and ETET programs. It provides a solid foundation in general robotic systems control for the design of smart mechanical devices with proper PID control techniques. It further enhances students' ability to engage in robotics and in new smart device development and testing.

Prerequisite: MECH 3672 or CET 3625 or EET 3212; *Corequisite:* MECH students only: MECH 4760

CET 4872**Robotic Systems Design and Applications***2 cl hrs, 3 lab hrs, 3 cr*

An elective course in the robotic concentration or the MECH, CET, and ETET programs. It provides an opportunity for students to engage in design and application of robotic technology to create new products and to design industrial and consumer robots.

Prerequisite: non-EET students: MECH 4772 or EET 4112

Pre- or corequisite: CET students only: CET 4864

CET 4773**Inter-networking Technology***3 cl hrs, 3 lab hrs, 4 cr*

Technologies, protocols, and techniques used to connect a computer network with other networks through the use of gateways that provide a common method of routing information packets among the networks. Internet technologies for the connection of computing devices with other internal and external devices or systems. Topics include Local Area Networks (LAN) and Wide Area Networks (WAN) implementation, wireless networks implementation, network security, advanced switching and routing configuration, advanced TCP/IP configuration, and network management.

Prerequisite: CET 3510

CET 4805**Component and Subsystem Design II***1 cl hr, 2 rec hrs, 2 cr*

Continuation of CET 4705. Further design of subsystems requiring solution by differential equations. Worst-case designs and component tolerances, development of control systems. A term project may be assigned.

Prerequisite: CET 4705

CET 4811**Computer-Controlled Systems Design II***1 cl hr, 2 rec hrs, 2 cr*

A capstone course dealing with design and programming concepts of particular importance for computer-controlled systems. In the lab, students may choose to utilize their concept designs from CET 4711, or to design a new device from scratch. Students apply their knowledge of component design, systems design, control theory and computer programming to carry out detailed design of their device or system, build a working model and program a computer to perform the desired measurement and/or control functions.

Prerequisites: CET 3640, CET 4711; Pre- or corequisites: CET 4773, CET 4805, CET 4864

CET 4864**Principles of Feedback Control Systems***3 cl hrs, 3 lab hrs, 4 cr*

Introduction to feedback concepts (positive and negative). Transient and steady-state analysis using Laplace transforms. Bode plots, stability analysis, and controller design. Lab work includes the use of mathematical analysis and simulation.

Prerequisites: CET 3625, MAT 2580

CET 4900**Internship in Computer Engineering Technology***2 cl hrs bi-wkly, 120 field hrs, 3 cr*

Assignment to field work/study situations of approximately eight hours per week at one of the following: small, medium, or large companies or governmental institutions. Students may work in design, manufacturing, installation, programming, troubleshooting, or other appropriate activities related to computer-controlled electromechanical devices or systems, computer hardware, or computer-based instrumentation and control systems. Students keep a log or journal to be shared in the group seminar. Supervision provided by faculty and by the job supervisor.

Prerequisites: CET 3510, CET 4705, CET 4711, and EMT 2410 or CST 2403

TECHNICAL ELECTIVES

These courses are offered as the needs and preferences of the students require. Since some time may elapse between offerings, the content changes to reflect advances in the relevant technology.

CET 4925**Internet of Things***2 cl hrs, 2 lab hrs, 3 cr*

Introduction to the architecture of Internet of Things (IoT) and the basics of key technologies for developing an IoT system, including physical computing, communication and connectivity. A variety of IoT implementations and applications are introduced. Students use some of the technologies with experimental hardware platforms to implement a prototype IoT system.

Prerequisite: CET 4711 or department approval

CET 4930**Applied Mechanics***3 cl hrs, 3 lab hrs, 4 cr*

The practical application of the principles of statics and dynamics. Topics include force systems, resultant forces, beams and trusses. Also work, power energy and motion (rectilinear and curvilinear).

Prerequisites: MAT 1575 with a grade of C or higher, PHYS 1433 or PHYS 1441

CET 4942**Economics of Engineering and Management***3 cl hrs, 3 cr*

The concepts of the interrelationship between time and money. Factors that go into cost analysis: material, labor, overhead, depreciation, present and future worth.

Prerequisite: MAT 1575 with a grade of C or higher

CET 4950**Heating, Ventilation and Air Conditioning***3 cl hrs, 3 cr*

Applicable concepts in heat transfer, fluid mechanics and thermodynamics. Heating and cooling load characteristics. Energy conservation parameters for contemporary design. *Prerequisites:* MAT 2680 and CET 3625 both with a grade of C or higher

CET 4952**Robotics Technology***3 cl hrs, 3 lab hrs, 4 cr*

Geometric configurations and classifications of robots, work envelope, drive components (electric, hydraulic, pneumatic), computer controls and interfacing, sensors and data acquisition/handling and conversion. Lab projects using a robot/computer system.

Prerequisite: CET 3510; Pre- or corequisite: MAT 2580

CET 4960**Applied Digital Technology**

3 cl hrs, 3 lab hrs, 4 cr

An introduction to the use of the digital computer for measurements of real-world signals and control of real-world devices. Students program data acquisition and control hardware in a high-level language such as C.

Prerequisites: : MAT 1575 with a grade of C or higher; EMT 2410 or CST 2403

CET 4962**Applied Software Technology**

3 cl hrs, 3 lab hrs, 4 cr

Development of hardware-oriented programming skills. Students write programs to access external devices via the serial port or other interfaces.

Prerequisites: : MAT 1575 with a grade of C or higher; EMT 2410 or CST 2403

CET 4963**Modern Communications Electronics**

3 cl hrs, 3 cr

Introduction to digital communication via RF and microwave as well as optical communication over fiber optic links. Noise theory, s/n ratio, AM and FM.

Prerequisites: MAT 2680, CET 3625 both with a grade of C or higher

CET 4964**Electro-Optical Technology and Applications**

3 cl hrs, 3 lab hrs, 4 cr

Combines the principles of optics and electronics. Theory and applications of modern devices including lasers, LEDs and fiber optics. Background material in classical optics (refraction, total internal reflection, interference, wave/particle duality).

Prerequisites: CET 3525, PHYS 1434 or PHYS 1442

CET 4970**Design of Electrical Equipment Installations**

3 cl hrs, 3 cr

Introduction to generation and distribution systems. Distribution systems used in buildings for power and light including code requirements. Load factors for typical mechanical and electrical equipment. Analysis of a complete design and specification of a selected project. Elements of estimating and contracts including pricing.

Prerequisites: MAT 1575 with a grade of C or higher, CET 3525

CET 4971**Linear Integrated Circuit Applications**

3 cl hrs, 3 lab hrs, 4 cr

The use of linear ICs for the control of mechanical and electronic systems. Topics include op. amps, power amplifiers, D/A converters, regulators

and opto-isolators.

Prerequisites: MAT 2680, CET 3625 both with a grade of C or higher, CET 4960 or equivalent

CET 4972**Digital Integrated Circuits**

3 cl hrs, 3 lab hrs, 4 cr

Design and analysis of ICs in digital applications. Functional differences and design considerations.

Prerequisite: CET 3510

CET 4973**Introduction to Artificial Intelligence**

2 cl hrs, 2 lab hrs, 3 cr

Introduction to basic methods of Artificial Intelligence (AI) such as searching, knowledge representation, problem solving and learning.

Through discussions, small projects and examples, students learn what AI is, some of the major developments in the field, promising directions and the techniques for making computers exhibit intelligent behavior. Students make use of available development tools and explore some areas of application such as recommender systems, natural language processing, robotics and machine learning.

Prerequisite: CET 4711 (or department approval)

CET 4974**Introduction to Computer-Aided Design**

3 cl hrs, 3 lab hrs, 4 cr

Theory and concepts of CAD and CAM using industry-standard graphics work stations. Coordinate systems, drafting practices, computational methods, database management and manufacturing considerations.

Prerequisites: CET 3510, MAT 2680, CET 3625 all with grades of C or higher

CET 4980**Special Projects in Technology or****CET 4981****Special Projects in Technology or****CET 4982****Special Projects in Technology**

1 to 3 cr (credits vary by scope and depth of project)

Projects chosen for their particular or current interest to students. Students work on their own and must select a project topic and work with a faculty mentor.

Prerequisite: Department chair approval

CET 4983**Engineering Technology III**

2 cl hrs, 3 lab hrs, 3 cr

Solution of complex real-world problems including complete engineering documentation. Topics

change to reflect current technology and industrial need.

Prerequisites: CET 4705, CET 4710 or CET 4711; Pre- or corequisites: CET 4805, CET 4810 or CET 4811

Computer Systems Technology

Professor Hong Li, Chair
Namm Hall, room N 914
718.260.5170
email: hli@citytech.cuny.edu

PROGRAMS:

Computer Information Systems/AAS
Computer Systems/BTech

FACULTY:

Professor: Cabo, X. Li
Associate Professors: Bellehsen, Elhadary, H. Li, Malyuta, Pinto
Assistant Professors: Chen, Filatova, Kusyk, Khatchadourian, Moody,
Oudjehane, Satyanarayana, Shahidullah, Shen
Lecturers: Archibald, Boulet, Holley, Milonas, Simmons, Viglina

Sr. CLTs: Duong, Graham, Rodney
CLT: Liu

COMPUTER SYSTEMS TECHNOLOGY

The Computer Systems Technology Department offers two degree programs: AAS in Computer Information Systems, and bachelor of technology (BTech) in Computer Systems. The department also offers a variety of computer courses for students in other curricula. Some of these courses are designed for students in specific majors such as accounting, telecommunications technology or legal assistant studies, while some are intended to provide computer literacy to students in any major.

The Computer Systems Technology Department programs prepare graduates for positions in the information technology industry by:

- Offering a combination of courses that emphasize both the theoretical and practical foundation in computing.
- Offering the student a choice of sub-specialization in both established and emerging technologies within the computer field.
- Emphasizing a “hands-on” approach in all aspects of the curriculum including a required “capstone” internship course in the BTech program.
- Adjusting and upgrading curriculum and lab equipment on a timely basis for changes in computer technology.

Progression Requirements in the Associate and/or Bachelor Programs

A grade of “C” or better in each course designated with the prefix CST will be required for progression towards graduation.

Associate in Applied Science in COMPUTER INFORMATION SYSTEMS

The associate in applied science (AAS) in Computer Information System (CIS) prepares students for entry level careers in: computer programming, database programming and administration, web programming, and systems/network administration and support. It also provides students with a solid foundation in the field of computer systems which enables them to make a seamless transition to the bachelor of technology in Computer Systems. This curriculum is well balanced between the technical requirements and the liberal arts requirements. The curriculum also introduces students to the business world. Students are required to complete a semester of accounting and a semester in business management, to provide familiarity with the contexts in which computer systems are commonly used.

Student Learning Outcomes: General

Students demonstrate:

- a. An ability to apply the knowledge, techniques, skills, and modern tools of the discipline to computer systems technology activities.
- b. An ability to apply a knowledge of mathematics, science, engineering, and technology to computer systems problems that require application of principles and practical knowledge.
- c. An ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments.
- d. An ability to function effectively as a member of a technical team.
- e. An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature.
- f. An understanding of the need for and an ability to engage in self-directed continuing professional development.
- g. An understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity.
- h. A commitment to quality, timeliness, and continuous improvement in professional practice.

Student Learning Outcomes: Discipline-Specific

Students demonstrate knowledge and hands-on competence in:

- a. Applying and evaluating technological solutions to solve real-world problems.
- b. Basic problem solving using various fundamental algorithms.
- c. Understanding of fundamental concepts in respect to software development, databases, IT operations, security, and networking.
- d. Managing and troubleshooting a computer information system.
- e. Understanding current business practices in computer systems technology.

GENERAL EDUCATION COMMON CORE ^{1,2}		22 CREDITS
I – REQUIRED CORE (4 COURSES, 13 CREDITS)		
English Composition (2 courses, 6 credits)		
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
Mathematical and Quantitative Reasoning (1 course, 4 credits)		
MAT 1375 or higher ³	Precalculus	4
Life and Physical Sciences (1 course, 3 credits)		
Any Approved Course		3
II – FLEXIBLE CORE (3 COURSES, 9 CREDITS)		
In addition to the required courses listed below, select one course from any of the other four areas.		3
World Cultures and Global Issues		
Any Approved Course		
US Experience in its Diversity		
Any Approved Course		
Individual and Society		
PSY 1101	Introduction to Psychology	3
Creative Expression		
Any Approved Course		
Scientific World ⁴		
Any Approved Course		
One additional course from any group		
COM 1330 or higher	Public Speaking	3
Writing Intensive Requirement ⁵		
Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.		
PROGRAM-SPECIFIC DEGREE REQUIREMENTS		38 CREDITS
CST 1100	Introduction to Computer Systems	3
CST 1101	Problem Solving with Computer Programming	3
CST 1201	Programming Fundamentals	3
CST 1204	Database Systems Fundamentals	3
CST 1215	Operating Systems Fundamentals	3
CST 2307	Networking Fundamentals	3
CST 2309	Web Programming I	3
CST 2400	Computer Systems Management and Support	3
CST 2410	Introduction to Computer Security	3
CST 2801	Special Topics in Information Technology	1
Subtotal		28

Choose one elective from the following list:		3
CST 2301	Multimedia and Mobile Device Programming	
CST 2405	System Administration (Windows)	
CST 2406	Introduction to Systems Analysis and Design	
CST 2409	Web Programming II	
CST 2415	System Administration (UNIX/Linux)	
CST 2900	AAS Internship	
Additional Required Courses		
ACC 1101	Principles of Accounting	4
BUS 2425	Business Management	3
Core Courses		
MAT 1375	Precalculus or higher	Met as GenEd
PSY 1101	Introduction to Psychology	Met as GenEd
COM 1330 or higher	Public Speaking	Met as GenEd
Subtotal		18
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES		38
TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS		22
TOTAL CREDITS REQUIRED FOR THE DEGREE		60
¹ Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program. ² Specific courses listed are degree requirements that also meet CUNY Pathways general education requirements in that category. ³ Students without the requisite math background to enter MAT 1375 will be required to take MAT 1175 and/or MAT 1275 in preparation. This will increase the number of required credits for the degree by 4-8 credits. ⁴ Students may take any Scientific World course except CST 1000, which is for non- majors only. ⁵ A semester-specific list of writing intensive courses is available online at the City Tech Pathways website .		

Bachelor of Technology in COMPUTER SYSTEMS

This is the only comprehensive curriculum in CUNY that addresses the specific needs of the information technology (IT) industry by integrating theory, hands-on experience and industry exposure to applied skills through a required internship degree program component. It provides the student with the flexibility of choice in specialization areas:

- Database Systems
- Networking and Security
- IT Operation
- Software Development

The program's structures will allow for timely changes in specialization course offerings as the information technology field evolves.

Student Learning Outcomes: General

Students demonstrate:

- An ability to apply the knowledge, techniques, skills, and modern tools of the discipline to computer systems technology activities.
- An ability to apply a knowledge of mathematics, science, engineering, and technology to computer systems problems that require application of principles and practical knowledge.
- An ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments.
- An ability to function effectively as a member of a technical team.
- An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature.
- An understanding of the need for and an ability to engage in self-directed continuing professional development.
- An understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity.
- A commitment to quality, timeliness, and continuous improvement in professional practice.

Student Learning Outcomes: Discipline-Specific

In addition to the learning outcomes of AAS, BTech Students demonstrate knowledge and hands on competence in:

- Analyzing, designing, and implementing hardware and software computer systems.
- Applying project management techniques to computer systems.
- Demonstrating a deeper knowledge of at least one area of computing, such as software development, databases, information technology operations, networking and security, enabling the student to gain employment in the computing field.
- Understanding how management uses information systems to operate business enterprises.

Goals of the Bachelor of Technology in Computer Systems

- Provide highly qualified professionals who can understand, apply, manage and anticipate cutting-edge technology,
- Prepare marketable candidates for positions in the information technology field,
- Provide students with the command of applied skills in technical fields that require a solid foundation in scientific and mathematical theory as well as excellent communications, problem-solving and critical-thinking skills, allowing students to anticipate the direction of technology, not just to follow it,
- Provide graduates of related AAS programs in computer systems the opportunity to transfer into this program and earn a BTech degree required for progression in and graduation from the Computer Systems BTech program.

GENERAL EDUCATION COMMON CORE

43 CREDITS

I – REQUIRED CORE¹ (4 COURSES, 13 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101*	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1375 or higher *.2	Precalculus	4
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Life and Physical Sciences (1 course, 3 credits)

Any Approved Course

II – FLEXIBLE CORE (6 COURSES, 18 CREDITS)

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Individual and Society

PSY 1101*	Introduction to Psychology	
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Creative Expression

Any Approved Course

Scientific World³

Any Approved Course

One additional course from any group

PSY 2404	Personnel and Organizational Psychology	3
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III – COLLEGE OPTION REQUIREMENTS⁴ (12 CREDITS)

- One course in Speech/Oral Communication
COM 1330* Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course
Any Approved Course⁵ 3

- Additional liberal arts credits to reach a minimum of 42 credits in general education.

In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language.

MAT 2440	Discrete Structures and Algorithms I	3
MAT 2540	Discrete Structures and Algorithms II	3
	or	
MAT 1475	Calculus I	4

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

Associate-Level Degree Requirements (38 credits)

CST 1100	Introduction to Computer Systems	3
CST 1101	Problem Solving with Computer Programming	3
CST 1201	Programming Fundamentals	3
CST 1204	Database Systems Fundamentals	3
CST 1215	Operating Systems Fundamentals	3
CST 2307	Networking Fundamentals	3
CST 2309	Web Programming I	3
CST 2400	Computer Systems Management and Support	3
CST 2410	Introduction to Computer Security	3
CST 2801	Special Topics in Information Technology	1
ACC 1101	Principles of Accounting	4
BUS 2425	Business Management	3

Choose one elective from the following list:

CST 2301	Multimedia and Mobile Device Programming	
CST 2405	System Administration (Windows)	
CST 2406	Introduction to Systems Analysis and Design	
CST 2409	Web Programming II	
CST 2415	System Administration (UNIX/Linux)	
CST 2900	AAS Internship	

Baccalaureate-Level Degree Requirements (39 credits)

Courses common to all tracks

CST 4800	Project Management	3
CST 4900	Internship	
	or	
CST 4905	Information Systems Project	3

Students must complete all courses in one of the following four tracks:

Database

CST 3504	Database Design	3
CST 2406	Introduction to Systems Analysis and Design	
	or	
CST 3606	Object-Oriented Systems Analysis and Design	3
CST 3604	Quality Database Implementation	3
CST 3613	Application Development with Database	3

CST 4704	Data Warehousing	3
CST 4714	Database Administration	3
CST 4724	Data on The Web	3
Two Electives	Elective courses shall be chosen from any CST 35xx, CST 36xx and CST 47xx in the four tracks and CST 3520 Computer Forensics, CST 4706 Software Development Methodologies and CST 4701 Game Programming if prerequisites are met.	6

Networking and Security

CST 2405 ⁶	Systems Administration (Windows)	
	or	
CST 2415 ⁶	Systems Administration (UNIX/Linux)	3
CST 3507	Advanced Single-LAN Concepts	3
CST 3523	Task Automation in System Administration	3
CST 3607	Interconnectivity	3
CST 3610	Network Security Fundamentals	3
CST 4707	The LAN-Internet Connection	3
CST 4710	Advanced Security Technologies	3
CST 4715	Advanced Topics in System Administration	3
One Elective	Elective courses shall be chosen from any CST 35xx, CST 36xx and CST 47xx in the four tracks and CST 3520 Computer Forensics, CST 4706 Software Development Methodologies and CST 4701 Game Programming if prerequisites are met.	3

IT Operations

CST 2405 ⁶	Systems Administration (Windows)	
	or	
CST 2415 ⁶	Systems Administration (UNIX/LINUX)	3
CST 3507	Advanced Single-LAN Concepts	3
CST 3605	Virtualization	3
CST 3610	Network Security Fundamentals	3
CST 3615	Enterprise Applications	3
CST 4700	IT Service Management	3
CST 4709	Installing and Maintaining Web Servers	3
CST 4714	Database Administration	3
One Elective	Elective courses shall be chosen from any CST 35xx, CST 36xx and CST 47xx in the four tracks and CST 3520 Computer Forensics, CST 4706 Software Development Methodologies and CST 4701 Game Programming if prerequisites are met.	3

Software Development

CST 2301	Multimedia and Mobile Device Programming (If a student already took the course as part of AAS degree requirement, he/she will need to take another 3 credit elective course)	3
CST 3513	Object-Oriented Programming	3
CST 3519	Advanced Web Client Technologies	3
CST 3606	Object-Oriented Systems Analysis and Design	3
CST 3613	Application Development with Databases	3
CST 4708	Software Development and .NET Framework	3
CST 4713	Dynamic Web Development: Servlets and JSP	3
Two Electives	Elective courses shall be chosen from any CST 35xx, CST 36xx and CST 47xx in the four tracks and CST 3520 Computer Forensics, CST 4706 Software Development Methodologies and CST 4701 Game Programming if prerequisites are met.	6

ADDITIONAL PROGRAM-SPECIFIC REQUIREMENTS

BUS 3525	Strategic Management	3
COM 1330 or higher	Public Speaking	Met as GenEd
ENG 1101	English Composition I	Met as GenEd
ENG 1121	English Composition II	Met as GenEd
ENG 2575	Technical Writing	3
MAT 1375	Precalculus or higher	Met as GenEd
MAT 2440	Discrete Structures and Algorithms I	Met as GenEd
MAT 2540	Discrete Structures and Algorithms II	Met as GenEd
MAT 1475	Calculus I	Met as GenEd
PSY 1101	Introduction to Psychology	Met as GenEd
PSY 2404	Personnel and Organizational Psychology	Met as GenEd

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES **77**

TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS **43**

TOTAL CREDITS REQUIRED FOR THE DEGREE **120**

* Courses required for associate degree.

1 Specific courses listed are degree requirements that also meet CUNY Pathways general education requirements in that category.

2 Students without the requisite math background to enter MAT 1375 will be required to take MAT 1175 and/or MAT 1275 in preparation. This will increase the number of required credits for the degree by 4-8 credits.

3 Students may take any Scientific World course except CST 1000, which is for non-majors only.

4 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

5 Students may take any Interdisciplinary course except CST 1102, which is for non-majors only.

6 If a student already took both courses as part of the AAS degree, he or she will need to take a different 3-credit elective course, chosen from any CST 35xx, CST 36xx and CST 47xx in the four tracks and CST 3520 Computer Forensics, CST 4706 Software Development Methodologies and CST 4701 Game Programming if prerequisites are met

COURSES:

CST 1000

Foundations of Computing Pathways: Scientific World

3 cl hrs, 3 cr

This introductory course for non-computer systems majors highlights the use of computers in problem solving and enhances critical thinking skills. Students learn fundamental computer principles and study how technology influences our learning, communication, and social interactions.

Prerequisite: CUNY proficiency in mathematics, reading and writing

CST 1100

Introduction to Computer Systems

2 cl hrs, 2 lab hrs, 3 cr

An overview of machine architecture, software development, software engineering, data organization, ethics, computer security and the theory of computing. The course will cover algorithms – the introduction to computer programming – and historical and evolutionary developments of computers. Individual lab assignments and team projects will require Microsoft Office applications to create Word documents, charts (Excel), presentations (PowerPoint) and manipulation of databases (Access). *Pre- or corequisite: CUNY proficiency in reading, writing and mathematics or, if the course is taken as part of a Learning Community, CUNY proficiency in mathematics and reading; Corequisite: ENG 092W*

CST 1101

Problem Solving with Computer Programming

2 cl hrs, 2 lab hrs, 3 cr

Introduces concepts of problem solving using constructs of logic inherent in computer programming languages. Augmented by high level computer tools, enabling solutions to common algorithmic problems. Use of flowcharts to diagram problem solutions. Object oriented packages, flowcharting tools and viewing generated software code.

Prerequisite: CUNY proficiency in mathematics, reading and writing

CST 1102ID

Programming Narratives: Computer Animated Storytelling

College Option: Interdisciplinary

3 cl hrs, 3 cr

In this interdisciplinary course, through the study of the structure of narrative, concepts of problem solving, and the logic of computer programming languages, students develop a narrative-driven video game prototype. Emphasis is placed on creative writing and computational thinking.

CST 1102 is intended for non-CST majors.

Credits for this class will not count toward a BTEch in Computer Systems

Prerequisites: ENG 1101 and CUNY proficiency in mathematics

CST 1201

Programming Fundamentals

2 cl hrs, 2 lab hrs, 3 cr

Introduction to computer programming using the Java language. Fundamentals of Java programming language including

control structures and user-defined methods. Concepts of object-oriented programming. Create simple Graphic User Interfaces and web applications. Some Java libraries will be introduced in developing application projects.

Prerequisites: CST 1101 (and CST 1100 for CST students) with a grade of C or higher

CST 1202

Sequential Mainframe Programming

2 cl hrs, 2 lab hrs, 3 cr

Introductory course in the COBOL programming language. Topics include input-stream, data input, printer output, alphanumeric and numeric editing, the IF and EVALUATE statements, as well as the concepts of Structured Programming. Programming problems are assigned and executed through the CUNY Computer Center VM/MVS system.

Prerequisites: CST 1100, CST 1101, MAT 1175 or higher; Corequisites: MAT 1275, CST 1205

CST 1204

Database Systems Fundamentals

2 cl hrs, 2 lab hrs, 3 cr

This course will introduce the student to ANSI standard Structured Query Language (SQL). The course will cover the various syntax that governs this language. In-depth discussions and practice will be given so that the student will be able to manipulate (insert, update, delete and retrieve) data in a relational database.

Prerequisites: CST 1101 (and CST 1100 for CST students)

CST 1205

Operating Systems and MVS Job Control Language

2 lab hrs, 2 cr

This course will teach students the fundamentals concepts of Mainframe operating systems and MVS Job Control language (JCL). Students will learn how the operating system controls the computer's hardware by understanding IBM's Multiple Virtual Storage (MVS) operating system. In addition, this course will teach students the use IBM's utility programs, JES3 (Job Entry System 3) statements and how to create JCL job streams to submit work to the IBM MVS/ESA mainframe computer system.

Prerequisites: CST 1100, CST 1101;

Corequisite: CST 1202

CST 1215

Operating Systems Fundamentals

2 cl hrs, 2 lab hrs, 3 cr

Introduces basic concepts and structures of operating systems, and how computer operating systems allocate resources. Provides basic working knowledge of computer operating system commands, functions, and management approaches using the DOS, Windows, Linux and UNIX operating environments. Topics include: memory management, process management, device management, file management and operating system tools. Introduces command structures and explores operations using GUI and Command Language Interfaces.

Prerequisites: CST 1100, CST 1101

CST 2206
Introduction to Information Systems and Technologies

3 cl hrs, 2 lab hrs, 4 cr

This course is designed to teach students how information systems and technologies are part of businesses. Information technologies (IT) continually change the basic ways business transactions are implemented. Students need to understand the dynamic nature of today's network-enabled business climate, recognize the risks and understand the dynamic nature of today's network-enabled business climate, recognize the risks and opportunities Internet-based applications offer and gain knowledge about how the entire business industry is affected by technological changes.
Prerequisite: Eligibility for ENG 1101 and MAT 1275 or higher

CST 2301
Multimedia and Mobile Device Programming

2 cl hrs, 2 lab hrs, 3 cr

Covers Java language support of applications on cell phones, PDAs and other small computational devices. Strengths and limitations of using the Java Virtual Machine (JVM) on small devices. Issues involved in moving large multimedia files between platforms and their storage in databases. Specific topics: configurations and profiles; overview of programming mobile devices; standard and custom user interface elements and events; networking; record stores and persistence; text and multimedia messaging; drawing and animation using game APIs (Application Program Interface) and 3D APIs; audio and video APIs; and a comparison of current technologies.
Prerequisites: CST 1201, CST 1204

CST 2302
Sequential Mainframe Programming II

2 cl hrs, 1 lab hr, 3 cr

This course is a continuation of CST 1202, Sequential Mainframe Programming I. It covers advanced COBOL topics including control breaks, summary report writing, validity checking, one- and two-dimensional tables, the SORT statement, the techniques used in designing and writing structured COBOL programs involved in the maintenance of sequential datasets created and stored on direct access storage devices (DASD) and the creation and usage of VSAM data sets. Programming problems are assigned and executed through the CUNY Computer Center VM/MVS system.
Prerequisites: CST 1202, CST 1205;
Corequisite: MAT 1375

CST 2303
Online Programming (CICS)

2 cl hrs, 2 lab hrs, 3 cr

An introduction to real-time programming concepts. A hands-on programming experience will be gained using CICS and COBOL software on a mainframe. Topics include interactive pseudo-conversational programming, full-screen mapping and real-time program file management (add, delete, update and browse) of records in VSAM files.
Prerequisites: CST 1202 and CST 1205;
Corequisite: CST 2302, MAT 1375

CST 2307
Networking Fundamentals

2 cl hrs, 2 lab hrs, 3 cr

Introduces fundamental computer networking concepts and skills. Provides instruction in networking media, physical and logical topologies, and common networking standards and protocols. Conceptual framework of the OSI model, and its implementation with the TCP/IP and other network protocols. Both networking design and analysis methods. Provides knowledge necessary to design, install, configure and support network infrastructure effectively. Networking administration skills are developed for different operating systems.
Prerequisite: CST 1215

CST 2309
Web Programming I

2 cl hrs, 2 lab hrs, 3 cr

This course focuses on how to design and maintain interactive and dynamic websites using HTML, Cascading Style Sheets (CSS) and client-side scripting with JavaScript. The students will also learn basic Web Page design principles. The goal is to develop effective, pleasing and useful websites. In the JavaScript part of the course, students will develop real-world projects to learn JavaScript programming, the JavaScript Object Model, JavaScript event handlers and how to integrate JavaScript programs in an HTML document. Students will apply this knowledge to create pop-up windows and scrolling messages as well as to validate forms and enhance the use of images and form objects. Client-side scripting technology will also be used to create cookies and shopping cart applications.
Prerequisites: CST 1201

CST 2400
Computer Systems Management and Support

2 cl hrs, 2 lab hrs, 3 cr

This course introduces the student to the intricacies of a computer system and the desktop environment and

provides the student with the skills needed to perform common daily functions in the complex computing environments of small, medium, or large organizations. The major emphasis in this course will be on providing hands-on exercises and labs to help the student gain the necessary skills to support the desktop environment as well as give the student the theoretical foundations needed to understand the basic components of computer systems and how they interact.
Prerequisite: CST 2307

CST 2403
Introductory C++ Programming Language Part I

2 cl hrs, 2 lab hrs, 3 cr

This course is an intensive introduction to computer programming intended for CIS majors. Initial topics include the implementation in the C++ language of data types, operations, expressions, decision statements and loops. Other topics include functions and subprogram structure, pointers, arrays and structures. The course will teach the fundamental programming assignments aimed at reinforcing the material covered in class.
Prerequisites: (CST 1101 and (MAT 1275 or higher)) or MAT 1476 or (EMT 1111 and (MAT 1275 or higher))

CST 2405
System Administration (Windows)

2 cl hrs, 2 lab hrs, 3 cr

Introduces fundamental, vendor-independent system and networking administration concepts, and principles of system administration common to various Network Operating Systems. Provides broad understanding of the Windows 2003 Server operating system, including installation, configuration, Active Directory, users and groups management, establishing basic security, configuring and managing data storage, system monitoring and troubleshooting.
Prerequisite: CST 2307

CST 2406
Introduction to Systems Analysis and Design

3 cl hrs, 1 lab hr, 3 cr

An introduction to systems analysis and design concepts and tools including the three basic phases of the System Development Life Cycle: system analysis, system design and system implementation and maintenance. CASE tools are introduced to perform data-process modeling.
Prerequisites: CST 1201, CST 1204

CST 2409
Web Programming II

2 cl hrs, 2 lab hrs, 3 cr

This course focuses on how to design and maintain interactive and dynamic Web applications using server-side scripting. Students learn server-side scripting by using Hypertext Preprocessor (PHP) language. Students install and configure a Web server (Apache), PHP, and an open-source relational database (MySQL). Additionally, students also learn in PHP how to add functions and control structures, manipulate strings, access files and directories, manipulate data arrays, work with MySQL databases, save state information using hidden form fields, query strings, cookies and sessions. In addition, students learn how to include object-oriented programming techniques in PHP scripts, and learn techniques used to trace and resolve errors in PHP scripts. Other server-side technologies (ASP, Cold Fusion) are also introduced.
Prerequisite: CST 1204, CST 2309

CST 2410
Introduction to Computer Security

2 cl hrs, 2 lab hrs, 3 cr

This course is a practical guide to security issues facing computer professionals today. Students will acquire the knowledge and skills to maintain the integrity, authenticity, availability and privacy of data. It covers computer viruses, authentication models, certificates, group policy, cryptography and access control. It also introduces the fundamental security issues of programming, database and web server. Other topics include how to monitor the system for suspicious activity and fend off attacks, keep spies and Spam out of email, take ultimate control of security by encrypting data, design Active directory, blocking ports and locking down the registry.
Prerequisites: CST 2307 with grade of C or better
Equivalent to old course CST 3510

CST 2415
System Administration (UNIX/Linux)

2 cl hrs, 2 lab hrs, 3 cr

Fundamental networking administration concepts. Principles and ideas of system administration common to various Network Operating Systems. Network administration concepts using Linux: installation and configuration, shell commands and programming, users and groups management, establishing basic security, configuring and managing data storage, system monitoring and troubleshooting. All concepts are demonstrated through laboratory assignments.
Prerequisite: CST 2307

CST 2801
Special Topics in Information Technology

1 cl hr, 1 cr

This course explores the new and emerging trends in hardware and software that are at the leading edge of information technology. Topics will be selected from beyond the work of the 700-level courses in each of the six specialty modules. Topics will differ each semester, depending on what is the present state-of-the-art in information technology. Students will gather information on these topics by use of the Internet, attending seminars and trade shows and attending industry briefings. Students are expected to research an advanced topic and present it in verbal and written form. In addition, students will prepare for a job search through review of resume preparation, interviewing techniques, etc.

Prerequisites: Completion of two 2000-level courses

Equivalent to old course CST 4801

CST 2900
AAS Internship

120 hrs at internship site, 3 cr

Provides valuable experience in the Information Technology (IT) field. Minimum of 120 hours in a site pre-approved by the internship coordinator.

Pre- or corequisites: CST 2309, CST 1204, CST 2307

CST 3503
C++ Programming Part II

4 cl hrs, 3 cr

This course is an intensive description of object-oriented programming intended for BTech majors. Central to this object orientation is the concept of a class, which is a programmer-defined data type. Initial topics include implementation in the C++ language. The construction of class is based on both structures and functions, member functions, friend functions, operator overloading. Other topics include inheritance, virtual functions and polymorphism and class templates.

Prerequisite: CST 2403

CST 3504
Database Design

2 cl hrs, 2 lab hrs, 3 cr

This course is an overview of the database design process in the context of the System Development Methodology (Life Cycle). The three main phases in database design, namely: conceptual, using Entity Relational Diagram (ERD) and Unified Modeling Language (UML); logical, using the relational model, and physical, using a Database Management System (DBMS), are covered. The basics of the relational data model (concepts of relation,

attribute, primary key, and foreign key) are reviewed, and the mapping of the conceptual model to the relational model is discussed. Advanced concepts of relational theory (normalization, denormalization) are included. The Physical model of the database is built in the DBMS. Although students should be familiar with SQL from the prerequisite, a review of SQL statements will be included
Prerequisites: CST 1204 with a grade of C or higher

CST 3506
Object-Oriented Systems Analysis

2 cl hrs, 2 lab hrs, 3 cr

This course introduces the concepts of Object-Oriented Analysis through the use of CASE tools. Object-Oriented Analysis is the method that brings together the concepts of process modeling and data modeling into a unified framework. Abstract concepts will be explained and demonstrated as concrete examples using business situations with CASE tools. Topics will include objects and attributes; classification structures; assembly structures; subjects, attributes and services; transition to Object-Oriented Design.

Prerequisites: CST 2406 and MAT 1375 or higher

CST 3507
Advanced Single-LAN Concepts

2 cl hrs, 2 lab hrs, 3 cr

This course will provide the students with a comprehensive background in the general field of networking. The students will have the opportunity to design and implement both wired and wireless LAN based on the current technologies used in industry, examine one of the most important network protocols, the TCP/IP protocol and learn how to design (logical) IP networks. Students will be provided with an in-depth working knowledge of layered network architectures, protocols, standards, and hardware and software components. Students will have extensive hands-on exercises to gain the experience to design, configure, maintain LAN and configure IP networks, along with the use of TCP/IP tools. Building on a base of introductory technologies network concepts, this course includes a guide to troubleshooting network problems and those problems that arise with network-specific applications development. The student will be taught to create a troubleshooting process that identifies and isolates network problems in a consistent manner. Third party diagnostics tools will be presented together with native diagnostic utilities.
Prerequisites: CST 2307

CST 3508
Design of Graphic User Interfaces Visual Basic

2 cl hrs, 2 lab hrs, 3 cr

At the end of the course, students will be able to build programs that use a modern "visual" programming environment. They will be able to write object-oriented programs emphasizing object reusability and build state-of-the-art user interfaces for their programs. They will also be able to write programs with client/server capabilities using DDE and OLE that interact as clients and servers with respect to a database. Classroom exercises and additional exercises will demonstrate these concepts.

Prerequisites: CST 1101 and CST 1204 or MST 2304 and MAT 1375 or higher

CST 3513
Object Oriented Programming in Java

2 cl hrs, 2 lab hrs, 3 cr

This course introduces the fundamentals of object-oriented programming. Through intensive project assignments, students will master the concept and implementation of object-oriented programming which include programmer-defined data types, class inheritances and polymorphisms, abstract classes and interfaces. Building upon the knowledge learned in the CST1201 Programming Fundamentals, students will implement object-oriented programming in the Java programming language. Exception handling and Binary IO also will be introduced.

Prerequisite: CST 1201 with a grade of C or higher

CST 3519
Advanced Web Client Technologies

2 cl hrs 2 lab hours, 3 cr

Continuing from CST2309 Web Programming I, this course will further explore various tools and techniques for developing client side web applications. Students will learn how to develop platform-independent sites using the most current Web development technologies, learn a group of interrelated Web development techniques-AJAX(Asynchronous JavaScript and XML) – used on the client-side to create asynchronous web applications. Students will be introduced to XML and how to transform XML data using various technologies. More topics of JavaScript as Object-oriented programming and Flash will discussed for dynamic web development. A newer technology Ruby on Rails will be introduced in the course.

Prerequisite: CST 2309 with a grade of C or higher

CST 3520
Computer Forensics

2 cl hrs, 2 lab hrs, 3 cr

Computer forensics is a branch of digital forensic science pertaining to legal evidence found in computers and digital storage media. The goal of computer forensics is to examine digital media in a forensically sound manner with the aim of identifying, preserving, recovering, analyzing and presenting facts and opinions about the information. This course will guide students through conducting a high-tech investigation, from acquiring digital evidence to reporting its findings. Students will learn how to set up a forensics lab, how to acquire the proper and necessary tools, and how to conduct the investigation and subsequent digital analysis. They will use free downloads of the latest forensic software and become familiar with the tools of the trade.

Prerequisites: CST 2410 with a grade of C or higher

CST 3523
Task Automation in System Administration

2 cl hrs, 2 lab hrs, 3 cr

This course will introduce shell scripts both in Unix/Linux and window system which are very useful for system administration and system-level programmers interacting with OS or network. Through hands-on practices, students will learn basics of BASH/TCSSH (Unix/Linux) to write script performing automation tasks including file manipulation, program execution, and printing text. They will also learn the basics of PowerShell (Windows) and their use in task automation.

Prerequisites: CST 1201 and (CST 2405 or CST 2415)

CST 3559
Technical Documentation

2 cl hrs, 2 lab hrs, 4 cr

This interdisciplinary course focuses on how to design and manage technical documentation. Students learn Web programming and how to use industry-standard authoring tools to apply interactive multimedia elements and technical communication features such as tables of contents, indexes, glossaries, graphics, context-sensitive help, and simulations. The goal is to create a full documentation plan, build searchable help content, and publish in multiple formats (i.e., mobile platforms, Web, print, etc.).

Prerequisite: ENG 3770 or ENG 3775

CST 3603
Object-Oriented Programming

2 cl hrs, 2 lab hrs, 3 cr

This course introduces students to the powerful Visual C++ .NET with Visual Studio and the .NET

platform and to Microsoft's Windows integrated development environment. The extensive coverage of Graphical User Interface will give students the tools to build compelling and fully interactive unmanaged and managed application programs. The course will introduce the concepts implemented with managed code that enables Visual C++ .NET to use .NET framework class libraries that are shared among Microsoft's .NET languages. This course also will teach students to understand basic database model and queries, to understand and use ADO.NET's model and to use classes and interfaces of namespace System::Data and System::Data::OleDb to manipulate. *Prerequisite: CST 3503*

CST 3604 Quality Database Implementation

2 cl hrs, 2 lab hrs, 3 cr

This course is a continuation of the "Database Design" course. The course concentrates on the physical design and implementation of databases and the functionality of the Database Management Systems (DBMS) in support of concurrent, secure, well-performing, reliable, scalable database solutions. Also discussed are special database architectures and topics – distributed databases, data warehouses, and data quality and integration. Database and data warehouse concepts are illustrated on the Oracle RDBMS.

Prerequisite: CST 3504

CST 3605 Virtualization

2 cl hrs, 2 lab hrs, 3 cr

In this course, students will learn about the different virtualization technologies that a workstation or a server would not need dedicated hardware to run as independent entities, but instead can run on a virtual machine where the computer's hardware is emulated and presented to an operating system as if the hardware truly existed. Students will gain hands-on experience installing virtual workstations, virtual servers, and virtual storage. Students will also learn how to manage the virtual environment, and perform common administration tasks like backup and recovery of virtual machines.

Prerequisites: CST 3507 and (CST 2405 or CST 2415)

CST 3606 Object-Oriented Systems Design

2 cl hrs, 2 lab hrs, 3 cr

This course introduces the concepts of Object-Oriented Design through the use of CASE tools. The course covers the transition from object modeling to the coding in object-oriented procedure languages and object-oriented database management systems. Topics will include replicated objects, distribution of services throughout the system, code generation, reverse engineering, procedural abstraction, data abstraction, encapsulation, inheritance legacy conversions. Concepts will be demonstrated with the use of CASE tools on business examples.

Prerequisite: CST 2406 or CST 3513 with a grade of C or higher

CST 3607 Interconnectivity

2 cl hrs, 2 lab hrs, 3 cr

This course is built upon a firm foundation in Local Area Network and network communication technologies to integrate several existing LANs and network architectures. Students will examine one of the most important network protocols, the TCP/IP protocol and learn how to connect networks and manage those internetwork links. Network hardware devices used in most enterprise-wide networks will be introduced. It will teach how the Internet is constructed. Students will be presented with a comprehensive introduction to TCP/IP and its protocols. Students will have extensive hands-on exercises to gain the experience to design, configure IP networks, along with the use of TCP/IP tools. The students will be working on Cisco Catalyst multi-layers switches and on Cisco routers. Students will learn management and use of enterprise class network equipment. And additional technologies for making enterprise networks reliable and manageable will be described and presented.

Prerequisite: CST 3507

CST 3608 Distributed Application Processing

2 cl hrs, 2 lab hrs, 3 cr

This course covers the new approaches in client/server application development. The core of the course is the concept of business objects that serve as building blocks for distributed applications. Students will learn how to perform analyses, design and implement business objects in Visual Basic and how to utilize these objects for building multitier distributed applications.

Prerequisite: CST 3508

CST 3610 Network Security Fundamentals

2 cl hrs, 2 lab hrs, 3 cr

This course is designed to provide a comprehensive overview of network security. It covers authentication methods along with common network attacks and how to safeguard against them. It also teaches important communication security aspects related to the use of remote access, the Web, directory and file transfer, and wireless data. It introduces the students the pre-attack phases: reconnaissance, scanning and enumeration; layer 2/3 and TCP/IP attacks and vulnerabilities; major security vulnerabilities in web applications; Security Protocols; Firewalls and their implementation topologies; VPN, IDS, Wireless security and Honey net; Security Logging and Auditing.

Prerequisite: CST 2410

CST 3613 Application Development with Databases

2 cl hrs, 2 lab hrs, 3 cr

This course is an overview of the design and implementation of 2-tier Java Applications. It will explore the concepts and processes that connect a Graphic User Interface (GUI) developed in Java programming language to a database using JDBC. Working through projects, students will learn to create applications that connect to databases, execute SQL commands and manipulate data sets retrieved from databases. Several advanced Java database applications will be studied, such as stored procedures, scrollable and updateable result sets, row sets and storing/retrieving images from a database.

Prerequisite: CST 1201 and CST 1204 with grade of C or higher

CST 3615 Enterprise Applications

2 cl hrs, 2 lab hrs, 3 cr

This is a survey course in which students will learn how different enterprise applications integrate with other systems commonly used by an organization, and how to select, deploy, configure and manage enterprise applications including communication software (email, internet telephony/VoIP), messaging and collaboration systems, business intelligence and analytics, customer relationship management (CRM), enterprise resource planning (ERP), content management systems as well as the cloud computing, a widely used architecture to deploy enterprise applications as a service over the internet. The selection of enterprise applications discussed in the course may vary from semester to semester.

Prerequisites: CST 3507 and (CST 2400 or CST 2405 or CST 2415)

CST 3619 Web Services Architecture

2 cl hrs, 2 lab hrs, 3 cr

This course introduces students to software architectures designed to enable computer programs to communicate over a network using open standard Internet protocols (Web Services). The course covers the standards that enable SOAP (Simple Object Access Protocol) based Web Services: XML Schema, SOAP, WSDL (Web Service Definition Language), and UDDI (Universal Description Discovery and Integration). Students will also learn how to implement Web Services using a REST (Representational State Transfer) based architecture (RESTful). The course describes the proper design of Web Services and applications to implement a service-oriented architecture (SOA). *Prerequisite: CST 3519 with grade of C or higher*

CST 4700 IT Service Management

2 cl hrs, 2 lab hrs, 3 cr

This course introduces students to the theoretical and practical aspects of IT service management. Some of the popular IT management frameworks will be discussed and compared such as problem management, change management, configuration management, capacity planning, performance management, etc. This course will also provide students with the tools to design evaluate and streamline IT processes that deliver world class service.

Prerequisites: CST 2405 or CST 2415 with a grade of C or higher

CST 4701 Game Programming

2 cl hrs, 2 lab hrs, 3 cr

Video game development is a key part of the enormous entertainment technology industry. The software architecture behind video gaming also supports various simulation models and inter-personal communication technology. This course explores the major tools used to construct video games and applications dependent upon animation under a simulation environment. Students will design, develop and test small replicas of video games and commercial applications in this software arena, using the latest software development environments.

Prerequisite: CST 3513 with a grade of C or higher

CST 4703 UNIX Networking and the Internet

3 cl hrs, 2 lab hrs, 3 cr

This course covers UNIX communications and networking and how to access the Internet services from the local system. Topics

cover networking basics as applied to the UNIX operating systems, network file systems, modem and high-speed communications, UNIX communications programs, UUCP utilities, remote log-in programs, file transferring using FTP, the IP network addressing, the TCP/IP protocol stack and SNMP. In addition, students will be introduced to the Internet, electronic mail, telnet, gopher, usenet, the World Wide Web and other on-line services.
Prerequisite: CST 3603

CST 4704 Business Intelligence, Data Warehousing & Data Mining

2 cl hrs, 2 lab hrs, 3 cr

A general introduction to the design of data warehouses and data mining. Students learn the dimensional models and apply them to data warehouses for different business applications. Topics in data mining will range from statistics to machine learning to database, with a focus on analysis of large datasets. Data preparation, classification, prediction, associated rule mining and clustering will be covered with focus on applications to large real world data.
Prerequisite: CST 3604

CST 4706 Software Development Methodologies

2 cl hrs, 2 lab hrs, 3 cr

This course is an overview of the design and implementation of 2-tier Java Applications. It will explore the concepts and processes that connect a Graphic User Interface (GUI) developed in Java programming language to a database using JDBC. Working through projects, students will learn to create applications that connect to databases, execute SQL commands and manipulate data sets retrieved from databases. Several advanced Java database applications will be studied, such as stored procedures, scrollable and updateable result sets, row sets and storing/retrieving images from a database.
Prerequisite: CST 3513 with a grade of C or higher

CST 4707 The LAN – Internet Connection

2 cl hrs, 2 lab hrs, 3 cr

The architecture of the Internet will be discussed, including the protocols used. Students will study and research the concepts of interior and exterior routings and autonomous systems. Students plan for and connect a hypothetical company's existing integrated LAN with the Internet and its resources. Students will implement routing to interconnect their network with the rest of the class. The most current network operating systems will be used.

Students will research a contrived set of circumstances to satisfy a business case for interconnection, assess needs, user requirements and expectations, hardware and software requirements, cost and benefits estimates, and end-to-end connectivity issues. Student teams will implement actual connection and utilization of Internet resources. Several Wide Area Network technologies will be presented and studied with the emphasis on emerging technologies. The business aspect of the Internet will also be explored.
Prerequisite: CST 3607

CST 4708 Software Development and the .NET Framework

2 cl hrs, 2 lab hrs, 3 cr

Students in this course will develop a fundamental understanding of the tasks and issues associated with database administration including: planning, building, tuning, troubleshooting, securing and monitoring databases. Students will learn how to manage users, privileges, and resources, implement basic backup and recovery procedures and identify tuning opportunities.
Prerequisite: CST 3513 or CST 3503

CST 4709 Installing and Maintaining Web Servers

2 cl hrs, 2 lab hrs, 3 cr

This course is designed to teach students how to install, configure, administer and secure a Web Server. The lectures will give the student a solid understanding of how a Web Server works in a computer network. In the lab, the student will apply the concepts learned in the lectures by using Internet Information Services (IIS) and Apache Web Servers. The student will install IIS 5.0 server and will configure WWW Services and FTP Services. Once the servers are installed and configured, the student will play the role of Web master and perform various tasks including hosting multiple websites on a single computer using the Microsoft Management Console (MMC) and the configuration file for the Apache Server (Httpd.conf) and other administrative tools. The student will also learn about the risks of connecting a computer to the Internet. Network security, operating system hardening and how to secure the IIS and Apache Web Servers will be discussed. Students will also learn important concepts about secure communications like encryption and digital signatures and how those can be implemented in a Web server using the secure sockets layer (SSL) protocol.
Prerequisite: CST 2307 and CST 2309

CST 4710 Advanced Security Technologies

2 cl hrs, 2 lab hrs, 3 cr

This is an advanced network security course and it provides a comprehensive look at advanced security technologies in the real-world such as Firewalls, Virtual Private Network (VPN), Network Intrusion Detection Systems (IDS), Network Intrusion Prevention Systems (IPS) and their deployments with other network security components to secure networks. It also includes network security design, evolving security strategies, the evolution of identity and access management, policy and risk management. The students will be working on projects in the information security laboratory.
Prerequisites: CST 3507, CST 3610

CST 4713 Dynamic Web Development: Servlet and JSP

2 cl hrs, 2 lab hrs, 3 cr

Introduces the role of Servlets and Java Server Pages (JSP) and provides instruction in building web pages dynamically, organizing projects into web applications, and deploying these applications using a web server, such as Apache Tomcat. Hands-on laboratory exercises reinforce the material presented in the lectures and enable students to develop related programming skills.
Prerequisite: CST 3513 and CST 3613 and CST 2309, all with a grade of C or higher

CST 4714 Database Administration

2 cl hrs, 2 lab hrs, 3 cr

Students in this course will develop a fundamental understanding of the tasks and issues associated with database administration including: planning, building, tuning, troubleshooting, securing and monitoring databases. Students will learn how to manage users, privileges, and resources, implement basic backup and recovery procedures and identify tuning opportunities.
Prerequisite: CST 2405 or CST 2415 or CST 3604 with a grade of C or higher

CST 4715 Advanced Topics in System Administration

2 cl hrs, 2 lab hrs, 3 cr

This course will provide the students with the opportunity to deepen their knowledge in the field of administering and managing computing resources. First, students will study network services and managing computing resources in the network and how to deploy computing resources and understand

the logistical issues related as well as the technical tools available. Advanced topics include Network management protocols such as SNMP and management tool, datacenters integrates various types of computing systems, networking and storage resources that work to provide the best solutions to a set of business requirements such as Unified Computing Systems. This course provides an introduction to these new classes of architectures that are becoming readily available to students with a background in system administration. An introduction to the concepts of computing resources provisioning, high performance computing and cloud architectures will be presented.
Prerequisites: CST 3523 and CST 3607 and CST 3610

CST 4724 Data on The Web

2 cl hrs, 2 lab hrs, 3 cr

Students in this course will develop a fundamental understanding of Web databases and services on the semantic Web. Issues related to querying and retrieving information will be explored. A detailed framework for querying Web databases and services including case studies will be investigated. The design, creation, and maintenance of structured and controlled vocabulary such as ontologies, taxonomies and thesauri as they apply to Web databases will be explained and discussed in detail.
Prerequisites: CST 2309 and CST 3504 with a grade of C or higher

CST 4800 Project Management

3 cl hrs, 3 cr

This course covers the most modern techniques for managing large projects, with particular emphasis on projects involving the development of computer software. The course combines the discipline of project management with that of general management and the management of people. A case study follows students through the course as they work on problems in project scheduling, resource allocation and project control, using current project-management software on a microcomputer.
Prerequisites: Completion of two 3600-level courses

CST 4900 Internship in Computer Systems

1 cl hr, 120 field hrs/semester, 3 cr
Supervised work experience in the Information Technology field. The

experience can be in small, medium or large companies or governmental agencies. Students should gain experience in one of their areas of concentration. A minimum of 120 hours for a minimum of six weeks is required. Each student keeps a log/journal to be submitted to the faculty member at a minimum of twice during the semester. Final oral and written presentation of the internship experience will be shared with the entire internship group. The worksite supervisor will evaluate the intern, in addition to the faculty evaluation.

Prerequisites: Completion of two 3500-level courses and one CST 3600-level course and internship coordinator approval

CST 4905

Information Systems Project

3 cl hrs, 120 field hrs/semester, 3 cr

The course gives students hands-on experience in working with advanced programming tools in designing and building an information system (IS). Projects will be solicited from industry, non-profit organizations and the College or individual faculty members. The course allows students to utilize the knowledge in several areas of information technology and go through the main steps of IS life cycle: planning, design, development, implementation and maintenance. Students are organized in teams for different projects. Students will attend scheduled classes as well as work independently in teams. Students can schedule additional meetings with faculty members.

Prerequisites: Completion of two 3500-level courses and one CST 3600-level course and internship coordinator approval

area network and today's issues of computer security.

Prerequisite: CUNY proficiency in reading, writing and mathematics

MST 1101

Introduction to Microcomputers

2 cl hrs, 2 lab hrs, 3 cr

This course is specially designed to provide the students with a basic knowledge of computers and the computer industry. It is designed to give the student an understanding of the various facets of computing. The course will provide an overview of microcomputer operating systems and their role in hardware, software and data management. The student is introduced to the concept of binary and hexadecimal systems. In addition, students will receive instructions on the use of a commonly used word processor, Internet browser, presentation graphics software and spreadsheet software. The students will learn how to use the Internet as a research tool. The course will introduce the student to the basic concepts of telecommunications, local

Construction Management and Civil Engineering Technology

Professor Gerarda Shields, P.E., Chair
Voorhees Hall, room V 434
718.260.5338
email: gsheilds@citytech.cuny.edu

PROGRAMS:

Civil Engineering Technology/AAS
Construction Management Technology/AAS
Construction Engineering Technology/BTech
Construction Management/Certificate

FACULTY:

Professor: Cioffi
Associate Professors: Norouzi, Shields, Stegmaier
Assistant Professors: Allahverd, Guzman, Sowder, Villatoro, Wilson

Senior CLT: Santiago

Associate in Applied Science in CIVIL ENGINEERING TECHNOLOGY

The program prepares students for positions as engineering technicians in a broad range of public works projects including structures, transportation facilities, water supply, waste water treatment, geotechnical as well as construction inspection, materials testing and surveying. Included in the curriculum are courses in the theory of structures, fluids, surveying, soils and materials testing. Students enrolled in this program complete training for American Concrete Institute certification as Field Inspector (Level 1) of Fresh Concrete, NICET Level 1 Geotechnical Certification and the NSPS Survey Technician Certification. All technical courses incorporate computer applications. Courses in computer-aided drawing and Building Information Modeling (BIM) are integrated into the curriculum. Graduates of this program find employment with consulting engineering firms, testing laboratories, industrial organizations and governmental agencies involved with providing public works services and safeguarding the environment. Occupational titles include junior engineer, civil engineering technician, assistant project manager, surveyor, construction inspector and CAD technician.

Government-related agencies and organizations that regularly employ graduates of this program include the Dormitory Authority of the State of New York, the Port Authority of New York and New Jersey and the New York City Department of Transportation. Private sector employers include numerous general contractors, engineering consulting firms and construction management firms such as Boyis Lend Lease, Arnell Construction Co., Slattery Construction Co. and Turner Construction. Future Tech Consultants, Forest City Ratner Corp., AECOM, Parsons Brinkerhoff, HNTB Engineers, Leslie Robertson Associates, Lemle Wolff, Marcia Inspection Services, Mercator Land Surveying, Greenman Peterson, STV Inc., Haks Engineers, Hazen and Sawyer, Sciami, HDR and Columbia University.

Other Degree Opportunities

Students who have successfully completed the requirements for the AAS degree are eligible for transfer into the bachelor of technology program in Construction Technology or Facilities Management. [Click here](#) for complete descriptions. Students may also continue their education toward a baccalaureate degree at other colleges. Students considering transfer to another college are urged to consult with the department chairman or transfer advisor as soon as possible in order to select courses that will provide the maximum possible number of potential transfer credits. In all cases, actual transfer of credit depends on the policies of the receiving institution.

Approximate Additional Costs other than Tuition and College-wide Fees

Textbooks	\$1200
Supplies.....	\$250
NICET Soils Level 1 Certification.....	\$180
ACI Concrete Field Testing Certification	\$140
Survey Technician Certificate	\$50

ABET Accreditation

The program is accredited by the Engineering Technology Accreditation Commission of ABET, <http://www.abet.org/>.

ABET accreditation provides “assurance that a college or university program meets the quality standards established by the profession for which the program prepares its students. ABET accredits postsecondary programs housed in degree-granting institutions which have been recognized by national or regional institutional accreditation agencies or national education authorities worldwide” (ABET, 2014).

By adopting ABET’s Student Learning Outcomes (SLOs), our department has been able to instill the skills, knowledge, and professionalism that ABET requires for accreditation. Upon graduation, our students will be able to demonstrate following as per ABET’s General and Program Specific Criteria:

Program Educational Objectives for the AAS in Civil Engineering Technology

The CMCE department prepares our students for the following Program Educational Objectives to achieve or progress towards during their first few years after graduation:

1. Be employed as engineering or surveying technicians, inspectors, assistant project managers or CADD operators;
2. Pursue advanced degrees in civil engineering, construction or facilities management; and
3. Be encouraged to work towards obtaining professional licensure and certifications;

Student Learning Outcomes: General

- a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;
- b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;
- c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;

- d. an ability to function effectively as a member of a technical team;
- e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;
- f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
- g. an understanding of the need for and an ability to engage in self-directed continuing professional development;
- h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and
- i. a commitment to quality, timeliness, and continuous improvement.

Student Learning Outcomes: Program-Specific Criteria

- a. an ability to utilize principles, hardware, and software that are appropriate to produce drawings, reports, quantity estimates, and other documents related to civil engineering;
- b. an ability to conduct standardized field and laboratory tests related to civil engineering;
- c. an ability to utilize surveying methods appropriate for land measurement and/or construction layout;
- d. an application of fundamental computational methods and elementary analytical techniques in sub-disciplines related to civil engineering.

[Click here for annual enrollment and graduation data](#)

GENERAL EDUCATION COMMON CORE¹

28-30 CREDITS

I – REQUIRED CORE (4 COURSES, 14-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1475 ²	or higher	Calculus I	4
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Life and Physical Sciences (1 course, 4-5 credits)

PHYS 1433	General Physics I: Algebra Based	or	4-5
PHYS 1441	General Physics I: Calculus Based		

II – FLEXIBLE CORE (4 COURSES, 14-15 CREDITS)

In addition to the required courses listed below, select one course from any of the other three areas. 3

World Cultures and Global Issues

Any Approved Course

Individual and Society

Any Approved Course

Creative Expression

Any Approved Course

US Experience in its Diversity

ECON 1101	Macroeconomics	3
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Scientific World

PHYS 1434	General Physics II: Algebra Based	4
	or	
PHYS 1442	General Physics II: Calculus Based	5

One additional course from any group

MAT 1575 ³	Calculus II	4
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Writing Intensive Requirement⁴

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

36 CREDITS

CMCE 1110	Construction Drawings I	2
CMCE 1115	Statics	3
CMCE 1211	Construction Drawings II-Computer-Aided Drawing (CAD)	2
CMCE 1215	Strength of Materials	2
CMCE 1222	Surveying I	3
CMCE 2306	Materials Testing Laboratory	2
CMCE 2315	Elements of Structural Design-Steel	3
CMCE 2322	Surveying II	3
CMCE 2351	Fluid Mechanics	4
CMCE 2351L	Fluid Mechanics Lab	0
CMCE 2410	Construction Drawings III	2
CMCE 2416	Elements of Structural Design-Concrete	3
CMCE 2454	Applied Hydraulics-Water Supply	2
CMCE 2456	Soil Mechanics	3
CMCE 2457	Construction Techniques in Civil Engineering	2
ECON 1101	Macroeconomics	Met as GenEd
MAT 1475 ²	Calculus I or higher	Met as GenEd
MAT 1575 ³	Calculus II	Met as GenEd
PHYS 1433	General Physics I: Algebra Based	or
PHYS 1441	General Physics I: Calculus Based	
PHYS 1434	General Physics II: Algebra Based	or
PHYS 1442	General Physics II: Calculus Based	

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 36

TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS 28-30

TOTAL CREDITS REQUIRED FOR THE DEGREE 64-66

¹ Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.

² Students without the requisite math background to enter MAT 1475 will be required to take MAT 1175, MAT 1275, and/or MAT 1375 in preparation. This will increase the number of required credits for the degree by 4-12 credits.

³ Students who have already completed MAT 1575 may select either another mathematics course or another approved course from any Flexible Core group instead

⁴ A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

Curriculum by Semester

For students earning an associate in applied science (AAS) degree with a major in Civil Engineering Technology.

FIRST SEMESTER		CREDITS
CMCE 1110	Construction Drawings I	2
CMCE 1115	Statics	3
ENG 1101	English Composition I	3
MAT 1475 ¹	Calculus I	4
PHYS 1433	General Physics I: Algebra Based	4
	or	
PHYS 1441	General Physics I: Calculus Based	5
Subtotal		16/17
SECOND SEMESTER		
CMCE 1211	Construction Drawings II – Computer Aided Drawing (CAD)	2
CMCE 1215	Strength of Materials	2
CMCE 1222	Surveying I	3
MAT 1575 ²	Calculus II	4
GenEd Elective	Flexible Core	3
Subtotal		14
THIRD SEMESTER		
CMCE 2306	Materials Testing Laboratory	2
CMCE 2315	Elements of Structural Design – Steel	3
CMCE 2322	Surveying II	3
CMCE 2351	Fluid Mechanics	4
CMCE 2351L	Fluid Mechanics Laboratory	0
PHYS 1434	General Physics II: Algebra Based	4
	or	
PHYS 1442	General Physics II: Calculus Based	5
Subtotal		16-17
FOURTH SEMESTER		
CMCE 2410	Construction Drawings III	2
CMCE 2416	Elements of Structural Design – Concrete	3
CMCE 2454	Applied Hydraulics	2
CMCE 2456	Soil Mechanics and Laboratory	3
CMCE 2457	Construction Techniques in Civil Engineering	2
ENG 1121	English Composition II	3
ECON 1101	Macroeconomics	3
Subtotal		18
TOTAL CREDITS REQUIRED FOR THE DEGREE		64-66

¹ Students without the requisite math background to enter MAT 1475 will be required to take MAT 1175, MAT 1275, and/or MAT 1375 in preparation. This will increase the number of required credits for the degree by 4-12 credits.

² Students who have already completed MAT 1575 may select either another mathematics course or another approved course from any Flexible Core group instead

Associate in Applied Science in CONSTRUCTION MANAGEMENT TECHNOLOGY

The associate degree in applied science in Construction Management Technology program is the only one of its kind in the CUNY system. It prepares students for careers as managers and technicians in the field of construction. All facets of the construction process are studied including construction materials, methods, management and mechanical systems as well as all elements of structural design. Both the public and private sectors are studied from the time the project is conceptualized until it is turned over to an owner. The program combines an emphasis on construction management with components of engineering technology.

This degree includes within its core of construction management courses important components of both mathematics and physics to give the entry-level construction manager a variety of technical skills including an understanding of basic structural analysis and design. Additional technical skills are developed as they relate to building layout (surveying) and materials testing including training for The American Concrete Institute certification as Field Inspector (Level 1) of Fresh Concrete. The students learn to interpret and read construction drawings through a hands-on approach. All technical courses incorporate computers. Computer-aided drawing and building information modeling (BIM) are integrated into the curriculum. Graduates are prepared for immediate employment in every phase of building technology. Occupational titles include assistant construction superintendent, assistant estimator, assistant project manager, surveying technician, construction inspector and CAD technician.

Recent employers of the graduates of this program include numerous general contractors and construction management firms such as Turner Construction, Hunter Roberts, Delta Contracting, Cole Construction, Arnell Construction Co., Slattery Construction Co., BMI Construction, Forest City Ratner Corp., Plaza Construction, Schiavone Construction and Columbia University. Government-related agencies and organizations that regularly employ graduates include the Dormitory Authority of the State of New York, the Port Authority of New York and New Jersey and the New York City Departments of Transportation.

Applicants are urged to complete at least one year of academic mathematics including algebra, and introductory geometry and trigonometry in high school to avoid delaying their progress in this curriculum.

Other Degree Opportunities

Students who have successfully completed the requirements for the AAS degree are eligible for transfer into the bachelor of technology program in Construction Technology or Facilities Management. [Click here](#) for complete descriptions. Students may also continue their education toward a baccalaureate degree at other colleges. Students considering transfer to another college, are urged to consult with the department chairman or transfer advisor as soon as possible in order to select courses which will provide the maximum possible number of potential transfer credits. In all cases, actual transfer of credit depends on the policies of the receiving institution

Approximate Additional Costs other than Tuition and College-wide Fees

Textbooks	\$1200
Supplies.....	\$250
ACI Concrete Field Testing Certification	\$140
OSHA 10.....	\$100

GENERAL EDUCATION COMMON CORE¹ 24-25 CREDITS

I – REQUIRED CORE (4 COURSES, 14-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1275 ²	College Algebra and Trigonometry or higher	4
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Life and Physical Sciences (1 course, 4-5 credits)

PHYS 1433	General Physics I: Algebra Based	4
	or	
PHYS 1441	General Physics I: Calculus Based	5

II – FLEXIBLE CORE (3 COURSES, 10 CREDITS)

In addition to the required courses listed below, select one course from any of the other three areas. 3

World Cultures and Global Issues

Any Approved Course

Individual and Society

Any Approved Course

Creative Expressions

Any Approved Course

US Experience in its Diversity

ECON 1101	Macroeconomics	3
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Scientific World

MAT 1375 ^{2, 3}	Precalculus or higher	4
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Writing Intensive Requirement³

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 40 CREDITS

CMCE 1110	Construction Drawings I	2
CMCE 1114	Materials and Methods of Construction I	3
CMCE 1115	Statics	3
CMCE 1211	Construction Drawings II – Computer Aided Drawing (CAD)	2
CMCE 1215	Strength of Materials	2
CMCE 1221	Construction Management I	3
CMCE 1222	Surveying I	3
CMCE 1224	Materials and Methods of Construction II	2
CMCE 2306	Materials Testing Laboratory	2
CMCE 2315	Elements of Structural Design – Steel	3
CMCE 2319	Building Service Systems	2
CMCE 2321	Construction Management II	3
CMCE 2410	Construction Drawings III	2
CMCE 2412	Construction Estimating	2
CMCE 2416	Elements of Structural Design – Concrete	3
CMCE 2421	Construction Management III	3
MAT 1275 ²	College Algebra and Trigonometry or higher	Met as GenEd
PHYS 1433	General Physics I: Algebra Based	or
PHYS 1441	General Physics I: Calculus Based	Met as GenEd
ECON 1101	Macroeconomics	Met as GenEd
MAT 1375 ^{2, 3}	Precalculus or higher	Met as GenEd

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 40

TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS 24-25

TOTAL CREDITS REQUIRED FOR THE DEGREE 64-65

¹ Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.

² Students without the requisite math background to enter MAT 1275 will be required to take MAT 1175 in preparation. This will increase the number of required credits for the degree by 4 credits.

³ Students who have already met this requirement may choose an additional mathematics course or another course from any Flexible Core group.

Curriculum by Semester

For students earning an associate in applied science (AAS) degree with a major in Construction Management Technology.

FIRST SEMESTER		CREDITS
CMCE 1110	Construction Drawings I	2
CMCE 1114	Materials and Methods of Construction I	3
CMCE 1115 ²	Statics	3
MAT 1275 ^{1,3}	College Algebra and Trigonometry	4
PHYS 1433	General Physics I: Algebra Based	4/5
PHYS 1441	General Physics I: Calculus Based	
Subtotal		16/17
SECOND SEMESTER		
CMCE 1211	Construction Drawings II – Computer Aided Drawing (CAD)	2
CMCE 1215	Strength of Materials	3
CMCE 1221	Construction Management I	3
CMCE 1222	Surveying I	3
CMCE 1224	Materials and Methods of Construction II	2
ENG 1101	English Composition I	3
Subtotal		15
THIRD SEMESTER		
CMCE 2306	Materials Testing Laboratory	2
CMCE 2315	Elements of Structural Design-Steel	3
CMCE 2319	Building Service Systems	2
CMCE 2321	Construction Management II	3
MAT 1375	Precalculus	4
GenEd Elective	Flexible Core	3
Subtotal		17
FOURTH SEMESTER		
CMCE 2410	Construction Drawings III	2
CMCE 2412	Construction Estimating	2
CMCE 2416	Elements of Structural Design – Concrete	3
CMCE 2421	Construction Management III	3
ECON 1101	Macroeconomics	3
ENG 1121	English Composition II	3
Subtotal		16
TOTAL CREDITS REQUIRED FOR THE DEGREE		64-66

¹ Applicants are urged to complete at least one year of academic mathematics in high school to avoid delaying their progress in this curriculum. Students without the requisite math background to enter MAT 1275 will be required to take MAT 1175 in preparation. This will increase the number of required credits for the degree by four (4).

² Students must have already completed MAT 1275 with a grade of C or higher or be eligible for MAT 1375 or higher to take CMCE 1211

³ Students who have already met this requirement may choose an additional mathematics course or another course from any Flexible Core group.

Bachelor of Technology in CONSTRUCTION ENGINEERING TECHNOLOGY

The Construction Engineering Technology program is the only program of its kind in the City University of New York (CUNY) system. Graduates of this program will have the necessary technical skills for careers in construction management; engineering, construction operations and/or maintenance of the built environment; and infrastructure. All facets of the construction process are studied, including construction materials and methods, management and building systems as well as elements of structural design. Both the public and private sectors are studied from the time the project is conceptualized until it is turned over to an owner. The program combines an emphasis on construction management with the principles of engineering. This degree includes within its core of construction management courses important components of mathematics, physics and engineering to give the construction manager a variety of technical, analytical, organizational and communication skills. Students will have an understanding of basic structural analysis and design. Additional technical skills are developed as they relate to project layout (surveying) and materials testing, including training for The American Concrete Institute certification as Field Inspector (Level 1) of Fresh Concrete, OSHA 10 Certification, Certified Surveying Technician (CST) and the NICET Soils Level 1 Certification. Graduates will be able to specify project methods and materials, perform cost estimates and financial analyses and manage construction activities. Students will be able to plan, design, inspect and direct residential, commercial, infrastructure and transportation projects. Graduates of this program are prepared for immediate employment in every phase of construction. Most graduates will be hired by governmental agencies, consulting engineers, architects, contractors and developers. Occupational titles include: civil engineering technologist, soil technologist, construction technologist, foundation technologist, municipal engineering assistant, specifications writer – construction, structural design technologist, structural investigator, construction manager, superintendent, assistant project manager, safety director, field inspector.

Admission to the Bachelor of Technology Program in Construction Engineering Technology

There are many ways a student can enter the bachelor of technology program in Construction Engineering Technology. The BTech in Construction Engineering Technology is designed as a 2+2 program. Students may enter the program as freshmen if they meet the general college criteria for baccalaureate admissions. These students will follow the AAS curriculum in either Civil Engineering Technology or Construction Management Technology (64-66 credits) and earn the AAS degree. Current students may transfer to the BTech in Construction Engineering Technology from the AAS program in either Civil Engineering Technology or Construction Management Technology without a loss of credits after completing the AAS degree. A minimum GPA of 2.5 or better is required for entrance into this program. Current AAS students may elect to transfer to the BTech in Construction Engineering Technology prior to completion of the AAS degree in either Civil Engineering Technology or Construction Management Technology. Students who transfer prior to completion of the AAS degree must meet the following requirements: a minimum of 55 credits in the AAS degree, including MAT 1375 or MAT 1475, PHYS 1433, and a minimum GPA of 2.75. Students transferring

in from other majors within NYCCT and other institutions with related backgrounds would also be able to pursue the BTech in Construction Engineering Technology degree. A minimum GPA 2.5 or better is required for entrance into the bachelor of technology degree. Please consult the department for further information. In all cases, each degree will be evaluated course by course. Students with questions are advised to consult the Office of Admission for additional information. Transcripts of all entering students will be evaluated to determine the courses they must complete for the bachelor of technology degree. Students entering the program without the necessary background in mathematics and science will have to do additional course work in these areas. The College is seeking ABET accreditation; however, until such accreditation is granted, graduates will not be eligible to receive maximum education/ experience credits for a "professional engineering program" toward New York State licensure in professional engineering.

Advanced Standing Credit

There are great differences in Civil Engineering Technology, Construction Technology and Engineering Technology courses from one college to another. Credit will be granted for courses taken at other colleges if the courses are considered equivalent to those offered at New York City College of Technology. Final determination of credits for advanced standing granted to any student in this department will be made by the Registrar of New York City College of Technology and the Chair of the Department of Construction Management and Civil Engineering Technology.

GENERAL EDUCATION COMMON CORE

AAS CIVIL ENGINEERING TECHNOLOGY 46-48 CREDITS

AAS CONSTRUCTION MANAGEMENT 48-50 CREDITS

I – REQUIRED CORE (4 COURSES, 14-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101*	English Composition I	3
ENG 1121*	English Composition II	3

Mathematical and Quantitative Reasoning (2 courses, 8 credits)

MAT 1275 ^{1, *}	College Algebra and Trigonometry or higher (AAS Construction Management Technology)	
MAT 1475 ^{1, *}	Calculus I or higher (AAS Civil Engineering Technology)	4

Lab Science

PHYS 1433*	General Physics I: Algebra Based	4
	or	
PHYS 1441*	General Physics I: Calculus Based	5

II – FLEXIBLE CORE (6 COURSES, 20 - 21 CREDITS)

In addition to the required courses listed below, select one course from each of the other areas not met at associate level.

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

ECON 1101*	Macroeconomics	3
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Creative Expression

Any Approved Course	3
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Individual and Society

Any Approved Course	3
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Scientific World

PHYS 1434	General Physics II: Algebra Based	
	or	
PHYS 1442	General Physics II: Calculus Based	4-5

One additional course from any group

MAT 1375*	Precalculus (AAS Construction Management Technology)	
	or	
MAT 1575*, ¹	Calculus II or higher (AAS Civil Engineering Technology)	4

III – COLLEGE OPTION REQUIREMENT² (3 COURSES 12 CREDITS)

• One course in Speech/Oral Communication	
Any Approved Course	3
• One interdisciplinary Liberal Arts and Sciences course	
Any approved course	3
• Liberal Arts Elective	
At least one advanced course	6-8

In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language.

MAT 1475	Calculus I (AAS in Construction Management Technology)	4
MAT 1575 ³	Calculus II (AAS in Construction Management Technology)	4

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

Associate-Level Courses

Civil Engineering Technology AAS (36 CREDITS)

or
Construction Management Technology AAS (40 CREDITS)

Baccalaureate-Level Courses (21 credits)

CMCE 3501	Steel Fabrication Detailing	3
CMCE 3602	Heavy Construction Practices	3
CMCE 4700	Construction Law	3
CMCE 4701	Construction Field Management	3
CMCE 4702	Construction and Site Safety Management	3
CMCE 4800	Senior Capstone Project	3
ARCH 3551	Sustainability: History and Practice	3
ECON 1101	Macroeconomics	Met as GenEd
PHYS 1433*	General Physics I: Algebra Based	Met as GenEd
	or	
PHYS 1441*	General Physics I: Calculus Based	Met as GenEd

ADDITIONAL REQUIRED COURSES

AAS Civil Engineering Technology Major

For students having completed the AAS degree in Civil Engineering Technology (11 credits)

CMCE 1114	Materials and Methods of Construction I	3
CMCE 2319	Building Service Systems	2
CMCE 2412	Construction Estimating	2
CMCE 3520	Construction Management for Civil Engineering Technologists	4

AAS Construction Management Technology Major

For students having completed the AAS degree in Construction Management Technology (6 credits)

CMCE 2322	Surveying II	3
CMCE 2456	Soil Mechanics	3
MAT 1475	Calculus I	Met as GenEd
MAT 1575	Calculus II	Met as GenEd
PHYS 1434	General Physics II: Algebra Based or	
PHYS 1442	General Physics II: Calculus Based	Met as GenEd

BTECH ELECTIVES (CMCE) (9 credits)

Select three courses from the list below:

CMCE 4400	Bridge Building Technology	3
CMCE 4401	Special Topics	3
CMCE 4410	Land Development and Design	3
CMCE 4415	Real Estate Development Fundamentals	3
CMCE 4422	Geographic Information Systems	3
CMCE 4423	Transportation Engineering Technology	3
CMCE 4456	Foundation Analysis and Design	3
CMCE 4458	Earth Retaining Structures	3
CMCE 4460	Design of Temporary Structures	3
CMCE 4471	Quality Assurance	3
CMCE 4472	Risk Management in Construction	3
CMCE 4473	Advanced Building Information Modeling (BIM)	3

TOTAL CREDITS REQUIRED FOR THE DEGREE 123⁴ - 124⁵

* Met as GenEd

1 Students without the requisite math background to enter MAT 1475 or MAT 1575 will be required to take prerequisites in preparation. This will increase the number of required credits for the degree by 4-12 credits.

2 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

3 For this degree only, MAT 1575 counts as an advanced liberal arts course for students who have an AAS in Construction Management Technology.

4 A minimum of 123 credits is required for the bachelor of technology degree for students with an AAS degree in Civil Engineering Technology.

5 A minimum of 124 credits is required for the bachelor of technology degree for students with an AAS degree in Construction Management Technology.

Curriculum by Semester

For students earning a bachelor of technology (BTech) degree in Construction Technology.

AAS Civil Engineering Technology Major

FIFTH SEMESTER

CMCE 1114	Materials and Methods of Construction I	3
CMCE 2319	Building Service Systems	2
CMCE 2412	Construction Estimating	2
CMCE 3501	Steel Fabrication Detailing	3
CMCE 3520	Construction Management for Civil Engineering Technologists	4

Subtotal 14

SIXTH SEMESTER

CMCE 3602	Heavy Construction Practices	3
ARCH 3551	Sustainability: History and Practice	3
CMCE	Technical Elective	3
GenEd Elective	Flexible Core	3
GenEd Elective	Flexible Core	3

Subtotal 15

SEVENTH SEMESTER

CMCE 4700	Construction Law	3
CMCE 4701	Construction Field Management	3
CMCE 4702	Construction and Site Safety Management	3
GenEd Elective	Liberal Arts Elective	3
COM 1330	Public Speaking or higher	3

Subtotal 15

EIGHTH SEMESTER

CMCE 4800	Senior Capstone Project	3
CMCE	Technical Elective	3
CMCE	Technical Elective	3
Liberal Arts Elective	Interdisciplinary	3
Liberal Arts Elective	Advanced	3

Subtotal 15

TOTAL CREDITS REQUIRED FOR THE DEGREE 123

Curriculum by Semester

For students earning a bachelor of technology (BTech) degree in Construction Technology.

AAS Construction Management Technology Major		
FIFTH SEMESTER		Credits
CMCE 2322	Surveying II	3
CMCE 2456	Soil Mechanics	3
CMCE 3501	Steel Fabrication Detailing	3
MAT 1475	Calculus I	4
PHYS 1434	General Physics II: Algebra Based or	
PHYS 1441	General Physics I: Calculus Based	4/5
Subtotal		17/18
SIXTH SEMESTER		
CMCE 3602	Heavy Construction Practices	3
ARCH 3551	Sustainability: History and Practice	3
MAT 1575	Calculus II	4
COM 1330	Public Speaking or higher	3
Subtotal		13
SEVENTH SEMESTER		
CMCE 4700	Construction Law	3
CMCE 4701	Construction Field Management	3
CMCE 4702	Construction and Site Safety Management	3
CMCE	Technical Elective	3
GenEd Elective	Flexible Core	3
Subtotal		15
EIGHTH SEMESTER		
CMCE 4800	Senior Capstone Project	3
CMCE	Technical Elective	3
CMCE	Technical Elective	3
Liberal Arts Elective	Interdisciplinary	3
GenEd Elective	Flexible Core	3
Subtotal		15
TOTAL CREDITS REQUIRED FOR THE DEGREE		124/126

Certificate in CONSTRUCTION MANAGEMENT

The Department of Construction Management and Civil Engineering Technology offers a 20-credit certificate in construction management.

The certificate has been designed to enhance the opportunities for those already employed in the construction industry without any formal academic or technical background in construction management, as well as to appeal to those seeking entry-level opportunities in the field. It is ideal for construction management personnel and their employees, for small contractors and for individuals wishing to pursue their own small contracting businesses. It serves those individuals seeking just a few courses, rather than a full degree program, on such topics as estimating, plan reading, interpreting specifications, etc.

All courses are the same credit-bearing courses as those offered in the AAS degree programs within the department, and may be used ultimately toward the AAS degree in construction management technology as well as the bachelor's degree in facilities management (construction management concentration). Course prerequisites may require an evaluation of a candidate's experience by a representative of the department.

REQUIRED COURSES IN THE MAJOR		CREDITS
CMCE 1110	Construction Drawings I	2
CMCE 1114	Materials and Methods of Construction I	3
CMCE 1211	Construction Drawings II – Computer Aided Drawing (CAD)	2
CMCE 1221	Construction Management I	3
CMCE 1224	Materials and Methods of Construction II	2
CMCE 2321	Construction Management II	3
CMCE 2412	Construction Estimating	2
CMCE 2421	Construction Management III	3
TOTAL CREDITS REQUIRED FOR THE CERTIFICATE		20

COURSES:

CMCE 1110

Construction Drawings I

4 cl hr, 2 cr

The fundamental principles of drawing for the construction field. Students learn a combination of manual and computer-aided drawing (CAD) techniques to develop a working knowledge of construction drawings. Students survey existing conditions and take field measurements to prepare construction drawings including scale, lettering, line work, geometric constructions drawings and basic

CAD commands to produce floor plans, exterior and interior elevations, sections, details and site plans.

Prerequisite: None

CMCE 1114

Materials and Methods of Construction I

2 cl hr, 3 lab hrs, 3 cr

Introduction to the construction and building techniques related to wood frame, brick, and masonry construction. The course is divided into two areas of study: Theory and Laboratory. In the theory segment

the students learn the language of construction, the terminology relating to the industry and accepted practices of construction. Construction materials and their application related to the finished product is also covered. Students construct a scaled model of a residential home during laboratory sessions to reinforce construction concepts. Reading and interpreting blue prints and the reading architectural and engineering scales will be covered.

Prerequisite: None

CMCE 1115

Statics

2 cl hrs, 2 lab hrs, 3 cr

An introduction to determinate static structures. Topics include civil engineering applications in: vector forces, friction, moment, external reactions of beams and trusses, internal bar forces in trusses and frames and geometric properties of structures. Labs and workshops are designed to enhance learning of concepts in a group setting. Students are required to achieve a minimum grade of C in order to pass this course.

Prerequisite: MAT 1275 with a grade of C or higher; Pre- or corequisite: PHYS 1433 (Algebra-based) or PHYS 1441 (Calculus-based)
Equivalent to old course CMCE 1104

CMCE 1211
Construction Drawings II – Computer Aided Drawing (CAD)

0 cl hr, 4 lab hrs, 2 cr
Advanced skills and working knowledge of computer-aided drafting techniques. Through the use of residential and commercial drawings, students build on their basic knowledge of both civil engineering and construction drawing principles and standards. Students use advanced editing and drawing commands to develop three-dimensional (3D) drawing and modeling techniques.
Prerequisite: CMCE 1110
Equivalent to old course CMCE 1210

CMCE 1215
Strength of Materials

2 cl hr, 2 cr
Introduction to the behavior of basic civil engineering materials under various types of loading. Engineering concepts for stress, strain, material properties, shear and bending moment diagrams, and torsion are explored with practical applications in civil engineering. Basic concepts of beam analysis and design are covered. A minimum grade of C is required in order to successfully pass this course.
Prerequisite: CMCE 1115 with a grade of C or higher
Equivalent to old course CMCE 1204

CMCE 1221
Construction Management I

3 cl hrs, 3 cr
A thorough overview of the construction process from the planning phase to successful completion. Topics include formal and informal communication formats, the design and construction process, types of contracts, responsibilities of project participants, contract documents, schedules, payments, building codes, and safety. Formal and informal communication are addressed through a series of spoken and written assignments culminating in a written report. Project safety is addressed in a required 10-hour OSHA certification training course. Upon successful (exam) completion, the student earns a certification card from OSHA.
Prerequisites: CMCE 1110, CMCE 1114, CUNY proficiency in reading and writing
Equivalent to old course CMCE 1220

CMCE 1222
Surveying I

1 cl hr, 4 lab hrs, 3 cr
Provides a basic working knowledge of surveying. The fundamental theory of plane surveying, as well as surveying procedures, including measurements of distances, elevations and direction are studied in detail. Through the use of steel tapes, automatic levels, theodolites and total stations, students learn hands on surveying skills needed to take field measurements. Students perform topographic surveys, construction surveys, and data reduction.
Prerequisites: MAT 1275 with a grade of C or higher, CMCE 1110; Pre- or corequisite: CMCE 1211
Equivalent to old course CMCE 1152

CMCE 1224
Materials and Methods of Construction II

1 cl hr, 2 lab hrs, 2 cr
This course covers the fundamentals of the major categories of any building construction project: foundation & substructure, the superstructure (structural frame); the building enclosure and interior work; and the site work. Currently used methods and materials of construction are emphasized. Cast-in-place and precast concrete frame construction; masonry construction; steel frame construction; curtain wall construction systems; interior finishes as well as an overview of Sustainable Construction and Green Building Design including the LEED – Green Building Rating System are covered
Prerequisites: CMCE 1110, CMCE 1114, CUNY proficiency in reading and writing

CMCE 2306
Materials Testing Laboratory

0 cl hr, 4 lab hrs, 2 cr
The mechanical properties of steel, timber, asphalt and concrete will be explored through laboratory testing. Standard tests for tension, compression, bending, shear, torsion, ductility, aggregate grading and asphalt are performed in accordance with ASTM and AASHTO standards. Principles of field inspection of fresh concrete are covered as well. Students take the "Concrete Field Testing Technician - Grade I" certification exam by the American Concrete Institute (ACI).
Pre- or corequisites: CMCE 2315, CUNY proficiency in reading and writing

CMCE 2315
Elements of Structural Design–Steel

3 cl hrs, 3 cr
This course provides a working knowledge of the basic concepts encountered in the analysis and design of structural steel elements.

The American Institute of Steel Construction (AISC) specifications for the design, fabrication and erection of structural steel for buildings are studied, particularly as they apply to the design of beams, columns and connections. Analysis methods and procedures are developed for solving practical problems encountered in civil engineering. Students will learn to use the charts, tables, design aids and specifications available for simple structural design which are contained in the "AISC Steel Handbook." Student projects include the use of desktop computers.
Prerequisite: CMCE 1215 with a grade of C or higher

CMCE 2319
Building Service Systems

2 cl hrs, 2 cr
This course provides the student with a basic knowledge of plumbing, heating, ventilation, air conditioning and electrical systems used in residential and commercial-industrial buildings. Modern methods and current equipment are emphasized.
Prerequisite: CMCE 1224
Equivalent to old course CMCE 2419

CMCE 2321
Construction Management II

3 cl hrs, 3 cr
An introduction to advanced planning, management techniques and computer applications. Topics covered include an expanded knowledge of the pre-construction and construction processes; a further understanding of construction and labor law; risk allocation and safety; accounting principles; material testing and quality control techniques; and changes, claims and disputes as well as discussion of the role of the project manager and project superintendent during the entire process. Students also study the LEED rating system and take a LEED certification exam at the end of this course (if qualified).
Prerequisites: CMCE 1110, CMCE 1221; Pre- or corequisite: CMCE 1224
Equivalent to old course CMCE 2320

CMCE 2322
Surveying II

1 cl hr, 4 lab hrs, 3 cr
An introduction to route surveying emphasizing mathematical problems relating to route design and layout including circular curves, parabolic curves, spiral curves, and roadway sections. Field work involves route layout with the use of electronic digital theodolite, total station and GPS equipment. Students are required to take the Certified Surveying Technician (CST) Level I exam as part of this course.
Prerequisite: CMCE 1222
Equivalent to old course CMCE 1252

CMCE 2351
Fluid Mechanics

4 cl hrs, 4 cr
The fundamentals of hydraulics for civil engineering technicians, including properties of fluids, fluid statics, manometers, forces on submerged plane and curved surfaces, buoyancy, principles of fluid flow, flow measurements, nozzles, Venturi meters, head losses. Use of commercial and non-commercial software as well as standard nomographs for solving hydraulic problems are utilized.
Prerequisite: CMCE 1215 with a grade of C or higher; Corequisite: CMCE 2351L

CMCE 2351L
Fluid Mechanics Laboratory

2 lab hrs, 0 cr
Fundamentals of fluid mechanics including: properties of fluids, fluid statics, manometers, center of pressure, buoyancy, stability, principles of fluid flow, flow measurements, frictional head losses, conservation of momentum and energy, pump power and efficient, and open channel flow.
Prerequisite: CMCE 1215 with a grade of C or higher

CMCE 2410
Construction Drawings III

1 cl hr, 3 lab hrs, 2 cr
An introduction to Building Information Modeling (BIM). Fundamental techniques, including planning a room, drawing details, using drafting views and working with text and elevations are covered. Students also learn the proper workflow for completing an entire project through a series of hands-on lessons using the computer software RIVET Architecture. Students learn how BIM is used in construction management, design and facility operations.
Prerequisites: CMCE 1110, CMCE 1211, CMCE 1222; Pre- or corequisite: CMCE 2315 or CMCE 2416
Equivalent to old course CMCE 2452

CMCE 2412
Construction Estimating

1 cl hr, 3 lab hrs, 2 cr
This course prepares students to estimate the cost of various types of construction. A detailed material takeoff is made from typical construction documents. Pricing including the cost of labor, material, equipment, subcontracts, overhead, contingencies and profit is discussed. Computer applications using commercially available software are introduced.
Prerequisite: CMCE 2321 or department approval

CMCE 2416
Elements of Structural Design – Concrete

3 cl hrs, 3 cr

This capstone course delivers a working knowledge of the basic concepts encountered in the analysis and design of reinforced concrete elements while integrating elements of computer aided drafting, estimation, and technical writing. The Building Code Requirements for Reinforced Concrete (ACI latest edition) is studied as it applies to the design and analysis of concrete beams, slabs, columns and footings for buildings. Students complete a capstone design project and submit a final design report as part of this course.

Prerequisites: CMCE 1211, CMCE 2315
Equivalent to old course CMCE 2415

CMCE 2421
Construction Management III

3 cl hrs, 3 cr

Builds on the concepts developed in Construction Management II to give a thorough understanding of the current practices for planning, documenting, managing, and analyzing construction projects. Students use industry standard computer scheduling software in preparing a Critical Path Method (CPM) project schedule and study the use of value engineering (VE) workshop to reduce construction costs. *Pre- or corequisite:* CMCE 2321 or department approval
Equivalent to old course CMCE 2420

CMCE 2454
Applied Hydraulics

2 cl hrs, 2 cr

This course builds on the knowledge and skills developed in the CMCE 2351 Fluids course. The principles learned are applied to the solution of practical design problems encountered in pipe and open channel flow systems, water supply and wastewater treatment. Topics include valves, pumps, storm water, sewer design and reservoir systems. Emphasis is given to New York City's water supply and wastewater treatment procedures and facilities. This course is a Hybrid course and will be taught partially online. *Prerequisites:* CMCE 2351, CMCE 2351L

CMCE 2456
Soil Mechanics and Laboratory

2 cl hrs, 3 lab hrs, 3 cr

This course combines soil theory, field practice and lab procedures. Students learn the origin and nature of soils, soil classifications, sampling, soil properties, strength characteristics, soil water relationships, settlement and consolidation concepts, lateral earth pressure and subsurface stresses. Students are required to

take the NICET Geotechnical Level 1 Certification Exam.
Prerequisite: CMCE 2351
Equivalent to old course CMCE 2352

CMCE 2457
Construction Techniques in Civil Engineering

1 cl hr, 2 lab hrs, 2 cr

Construction project management and heavy construction techniques, including buildings and civil engineering type structures (highways & bridges). Topics include construction management, professional ethics, contracts, and CPM scheduling. Sustainable Construction and the LEED Green Building Rating System are also introduced. The fundamentals of any construction project are covered in detail, including concrete, steel, masonry, and wood construction methods. The New York City Building and Zoning Codes and A.A.S.H.T.O are references. Each student is required to submit a research paper at the end of the semester, and must select a topic that is related to the construction of a reinforced concrete building, structural steel building or a civil engineering type structure.

Pre- or corequisite: CMCE 1222 or department approval
Equivalent to old course CMCE 2455

CMCE 2900
Construction Management Internship (Optional)

3 cr

see Department Chairperson for approval

CMCE 3501
Steel Fabrication Detailing

1 cl hrs, 4 lab hrs, 3 cr

Introduction to basic practice of structural steel fabrication details including the machining and detailing of structural steel sections in accordance with the exacting dimensions of detailed steel shop drawings. Topics include preparation of steel design drawings; fabrication equipment; and welding equipment, procedures and inspection.

Prerequisites: CMCE 1224 or CMCE 2457, CMCE 2315, CMCE 2410, or department approval

CMCE 3520
Construction Management for Civil Engineering Technologists

4 cl hrs, 4 cr

A thorough overview of advanced planning and management techniques for the construction process. Topics include project communications, CPM scheduling, safety, construction processes, risk allocation, accounting principles, material testing and quality control techniques, change

orders, claims and disputes. Project safety is addressed in a 10-hour OSHA certification training course. Students also study the LEED rating system and take a LEED certification exam (if qualified). Industry standard computer scheduling software, industry standard project management software and the use of value engineering (VE) workshop to reduce construction costs are also covered. This course is open to civil engineering technology students only.
Prerequisite: CMCE 2457

CMCE 3602
Heavy Construction Practices

3 cl hrs, 0 lab hrs, 3 cr

Heavy construction projects, such as highways, bridges, railroads, earthwork and pipelines, each have their own unique design and construction challenges. Students will gain a global understanding of the methods, equipment, and procedures used in heavy construction projects. Emphasis is placed on working with multidisciplinary engineers, contractors, and agencies; heavy and automated equipment, environmental impact analysis, sustainability and design life, safety, permitting, and regulations pertaining to heavy construction in the New York City area.

Prerequisites: CMCE 1224 or CMCE 2457, CMCE 2456, or department approval

CMCE 4400
Bridge Building Technology

3 cl hrs, 0 lab hrs, 3 cr

A study of the unique design considerations, construction challenges, and load paths for a range of bridge types. Topics include fixed and moveable bridges, stringer/girder, steel truss, concrete slab, box girder, arch, suspension, and cable stayed bridges. Emphasis is placed on AASHTO loading and design requirements, load testing, and verification of unconventional materials. Covers case studies of bridges in NYC and around the world.

Prerequisite: CMCE 2416 and CMCE 3501

CMCE 4401
Special Topics in Construction Engineering Technology

(spring only)

3 cl hrs, 0 lab hrs, 3 cr

New and improved technology and trends are constantly emerging in the construction engineering technology field. Students will be exposed to a particular technology and/or trend with the goal that they will be better able to adapt in the workplace. Emphasis is placed on instilling the need for lifelong learning and understanding professional, ethical

and social responsibilities that come with all advancements in technology, engineering, and science.
Prerequisite: CMCE 3602

CMCE 4410
Land Development and Design

1 cl hrs, 4 lab hrs, 3 cr

Introduction to the process of development on both suburban and urban parcels including federal, state and municipal land use regulations and federal and state regulations regarding environmental issues. The course will cover sustainability issues regarding environmental impact, social cohesion and broader professional requirements. Students will work through a development project from site placement to land survey and prepare a preliminary plan.
Prerequisites: CMCE 2322, CMCE 2410

CMCE 4415
Real Estate Development Fundamentals

3 cl hrs, 0 lab hrs, 3 cr

Students are introduced to the process required to develop and manage five types of real estate products: land, residential, office, industrial, and retail uses. Focusing on small-scale projects, student learn practical methods for developing each major type of real estate, including feasibility analysis, design and construction, financing, marketing, and management. Photos, site plans, diagrams, and case studies provide examples of actual projects and how the process works.

Prerequisites: CMCE 1224 or CMCE 2457

CMCE 4422
Introduction to Geographic Information Systems (GIS)

1 cl hrs, 4 lab hrs, 3 cr

Students gain a practical knowledge of GIS software and the fundamentals of how GIS marries databases to a spatial framework. The class work will include lectures on topologies, measurement methods, coordinate systems, map projections with practical instruction in the computer lab. Students will draw upon current projects and issues to create maps and provide analysis.
Prerequisites: CMCE 2322, CMCE 2410

CMCE 4423
Transportation Engineering Technology

3 cl hrs, 0 lab hrs, 3 cr

The planning, design, construction, operation, and maintenance of highways from the perspective of the transportation engineer. This course builds upon the knowledge and skills gained in the Surveying II course.
Prerequisites: CMCE 2322, CMCE 2410

CMCE 4456
Foundation Analysis and Design

3 cl hrs, 0 lab hrs, 3 cr
A continuation of Soil Mechanics. Students will apply soil mechanics principles to the design and analysis of both shallow and deep foundations. Installation and testing methods are also covered in this course. Case histories are used to illustrate typical design and construction methods.
Prerequisites: CMCE 2315, CMCE 2416, CMCE 2456

CMCE 4458
Earth Retaining Structures

3 cl hrs, 0 lab hrs, 3 cr
Introduction to classical lateral earth pressure theories. Students will apply soil mechanics principles to the design and analysis of earth retaining structures. Design and analysis of cantilever retaining (concrete and steel) walls as well as braced excavations are studied. Segmental retaining wall (SRW) systems are also covered in this course.
Prerequisites: CMCE 2315, CMCE 2416, CMCE 2456

CMCE 4460
Design of Temporary Structures

3 cl hrs, 0 lab hrs, 3 cr
An introduction to the design of systems that support construction activities and operations including the determination of design loads during construction and the application of these loads for the design of excavation support systems, earth retaining systems, temporary supports and underpinning, concrete formwork and shoring systems.
Prerequisites: CMCE 2315, CMCE 2416, CMCE 2456

CMCE 4471
Quality Assurance

3 cl hrs, 0 lab hrs, 3 cr
Topics include: the established quality elements of management responsibility; documented quality management system; design control; document control; purchasing; product identification and traceability; process control; inspection and testing; inspection, measuring, and test equipment; inspection and test status; nonconformance; corrective action; quality records; quality audits and training, documented in ISO 9000, 9001: 2000 FTA QA/QC Guidelines.
Prerequisite: CMCE 2421 or department approval

CMCE 4472
Risk Management in Construction

3 cl hrs, 0 lab hrs, 3 cr
Students learn to identify all risks associated with their specific contractual, financial, operational

and organizational requirements. Risk management strategies and risk transfer are covered. Topics include construction risks & exposures, claims, litigation, construction defect mitigation. Students learn and develop management strategies to reduce risk.
Prerequisite: CMCE 3602

CMCE 4473
Advanced Building Information Modeling (BIM)

1 cl hrs, 4 lab hrs, 3 cr
BIM is implemented as part of a comprehensive systems approach to the design, construction, management, operation, maintenance, and use of buildings. Topics include discussion of how BIM supports more streamlined, integrated, and efficient business processes throughout the life cycle of buildings, from their initial conception through their eventual retirement or reuse.
Prerequisite: CMCE 4422

CMCE 4700
Construction Law

3 cl hrs, 0 lab hrs, 3 cr
The writing intensive course introduces students to the areas of the law that they are most likely to encounter in construction. Following an introduction to the legal system and form of legal analysis, areas to be addressed will include contracts, procurement, scope definition, delays and acceleration, site conditions, warranties, termination, tort claims, international issues, dispute resolution, and ethics.
Pre- or corequisite: CMCE 3602

CMCE 4701
Construction Field Management

3 cl hrs, 0 lab hrs, 3 cr
This course provides the students with a working knowledge of the construction process, responsibilities of different parties, importance of project documentation, and effective work coordination. Details of jobsite layout planning, personnel management and labor relations, dispute resolution and negotiations, long term and short term procurements are discussed. The fundamentals of work progress measurement, time and cost control, and change order management are covered in detail.
Prerequisite: CMCE 2421 and CMCE 3602, or department approval

CMCE 4702
Construction and Site Safety Management

3 cl hrs, 0 lab hrs, 3 cr
Students acquire working knowledge of the construction hazards, safety precautions, and effective integration of safety regulations into the design and construction phases.

Different types of construction related hazards including crane, equipment and machinery, universal, access, construction, operation, and maintenance hazards together with methods to prevent them from happening are discussed.
Prerequisite: CMCE 2421 and CMCE 3602, or department approval

CMCE 4800
Senior Capstone Project

1 cl hr, 4 lab hrs, 3 cr
Integrates diverse elements of the curriculum and develops student competence using both technical and non-technical skills to solve problems. Students work in teams to solve a comprehensive problem from concept to final design, preparation of construction documents and cost estimates. Non-technical skills such as presentation skills, teamwork, accountability and ethics are emphasized. This course should be taken in the final semester of the Bachelor of Technology Degree.
Prerequisite: CMCE 4700 and department permission

Electrical and Telecommunications Engineering Technology

Professor Mohammad Razani, Chair
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Professor Mohammed Kouar, Telecommunications Coordinator
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PROGRAMS:

Electrical Engineering Technology/AAS
Electrical Technology/BTech
Telecommunications Engineering Technology/AAS
Telecommunications Engineering Technology/BTech

FACULTY:

Professors: Goykadosh, Kalechman, Mynbaev, Razani
Associate Professors: Hossain, Kouar, Marantz, Ummy, Vladutescu, Wei
Assistant Professor: Geng

CLTs: Smith, Tang, Yuan

Associate in Applied Science in ELECTRICAL ENGINEERING TECHNOLOGY

The Electrical Engineering Technology program is designed to prepare graduates for careers as electronic technicians. The curriculum includes a balanced distribution of lecture and laboratory courses which provide an introduction to the design and development of basic electronic circuits. Laboratory construction projects range from elementary circuit analysis to microprocessors. The personal computer (PC) is used as a learning tool throughout the curriculum. The department provides graduates with a deep knowledge of technology coupled with a sound general education.

Responsibilities of electronic technicians are mostly in maintenance and control of the installed equipment; however, there is a tendency to involve them in design, development and research. The electronic technician usually works as part of an engineering team that may include electrical engineers, engineering technicians and draftsmen. In a group concerned with engineering design, the electronic technician may determine the positions of electronic components on a panel or chassis, suggest design modifications to facilitate production, perform design calculations for engineers, prepare specifications for materials and components, estimate cost of design alternatives and help write user and technical manuals for electronic equipment users.

When working in research and development, the electronic technician may construct breadboard layouts of electronic devices, make experimental chassis and cabinets for prototype equipment, set up special environmental and performance tests for new products, design and construct test fixtures and apparatus, plot graphs of test results and write reports, inspect and calibrate test equipment.

Employers of the graduates of this program include a variety of companies such as Con Edison, IBM, ITT, Avaya, USPS, NYPD, MTA, JPMorgan Chase and Verizon.

To be admitted to the electrical engineering technology associate degree program, an entering student must meet the CUNY proficiency requirements in reading and mathematics.

Graduates of this program have the opportunity to continue their education toward a bachelor of technology degree in Telecommunications Engineering Technology at New York City College of Technology or in other bachelor's programs.

Accreditation

The program is accredited by the Engineering Technology Accreditation Commission of ABET, <http://www.abet.org/>.

To accomplish its mission, the ETET department has established the following Program Educational Objectives (PEO) and Program Student Outcomes (PSO) for the Electrical Engineering Technology curriculum (AAS degree).

Program Educational Objectives

1. This degree will equip students to secure gainful and meaningful careers as electrical or electronic technicians.
2. Embark on careers of personal and professional growth.
3. Pursue life-long learning to enhance their undergraduate degree, through formal education and/or certification in order to improve their careers.

Program Student Outcomes

General (Adopted from ETAC/ABET Criterion 3)

Students demonstrate:

- a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;
- b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;
- c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;
- d. an ability to function effectively as a member of a technical team;
- e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;
- f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
- g. an understanding of the need for and an ability to engage in self-directed continuing professional development;
- h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and
- i. a commitment to quality, timeliness, and continuous improvement.

Discipline Specific

(Adopted from ETAC/ABET Program Criteria)

Students demonstrate knowledge and hands on competence in:

- PC a. the application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers to the building, testing, operation, and maintenance of electrical/electronic(s) systems.
- PC b. the applications of physics or chemistry to electrical/electronic(s) circuits in a rigorous mathematical environment at or above the level of algebra and trigonometry.

[Click here for annual enrollment and graduation data](#)

GENERAL EDUCATION COMMON CORE¹

28-30 CREDITS

I – REQUIRED CORE² (4 COURSES, 14-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1375 ³	Precalculus or higher	4
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Life and Physical Sciences (1 course, 4-5 credits)

PHYS 1433	General Physics I: Algebra Based	4
	or	
PHYS 1441	General Physics I: Calculus Based	5

II – FLEXIBLE CORE (4 COURSES, 14-15 CREDITS)

In addition to the required course listed below, select one course from any two of the following areas

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Note: ECON 1101 Macroeconomics meets a baccalaureate degree requirement.

Individual and Society

Any Approved Course

Note: PHIL 2106 Philosophy of Technology meets a baccalaureate degree requirement.

Creative Expression

Any Approved Course

Scientific World

PHYS 1434	General Physics II: Algebra Based	4
	or	
PHYS 1442	General Physics II: Calculus Based	5

One additional course from any group

MAT 1475	Calculus I or higher	4
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Writing Intensive Requirement⁴

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

39 CREDITS

EET 1102	Techniques of Electrical Technology	2
EET 1122	Circuit Analysis I	4
EET 1202	Electrical Drafting	1
EET 1222	Circuit Analysis II	5
EET 1240	Electronics	4
EET 1241	Electronics Laboratory	1
EET 2122	Advanced Circuit Analysis	3
EET 2140	Communications Electronics	3
EET 2141	Communications Electronics Laboratory	1
EET 2150	Electric Machines Theory	3
EET 2162	Digital Electronics I	3
EET 2171	Projects Laboratory	1
EET 2220	Electronic Controls	3
EET 2251	Electric Machines Lab	1
EET 2262	Digital Electronics II	3
EET 2271	Circuits Analysis Lab	1
MAT 1375	Precalculus or higher	Met as GenEd
PHYS 1433	General Physics I: Algebra Based	or
PHYS 1441	General Physics I: Calculus Based	Met as GenEd
PHYS 1434	General Physics II: Algebra Based	or
PHYS 1442	General Physics II: Calculus Based	Met as GenEd
MAT 1475	Calculus I or higher	Met as GenEd

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES

39

TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS

28-30

TOTAL CREDITS REQUIRED FOR THE DEGREE

67-69

1 Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.

2 Specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category. Students are advised that a different choice may result in additional credits being needed for graduation.

3 Students without the requisite math background to enter MAT 1375 must take MAT 1175 and/or MAT 1275 in preparation, depending on initial placement. This will increase the number of required credits for the degree by 4-8.

4 A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

Curriculum by Semester

For students earning an associate in applied science (AAS) degree with a major in Electrical Engineering Technology.

FIRST SEMESTER		CREDITS
EET 1102	Techniques of Electrical Technology	2
EET 1122	Circuit Analysis I	4
MAT 1375 ¹	Precalculus	4
PHYS 1433	General Physics I: Algebra Based or	4
PHYS 1441	General Physics I: Calculus Based	5
ENG 1101	English Composition I	3
Subtotal		17-18
SECOND SEMESTER		
EET 1202	Electrical Drafting	1
EET 1222	Circuit Analysis II	5
EET 1240	Electronics	4
EET 1241	Electronics Laboratory	1
MAT 1475	Calculus I	4
PHYS 1434	General Physics II: Algebra Based or	4
PHYS 1442	General Physics II: Calculus Based	5
Subtotal		19-20
THIRD SEMESTER		
EET 2122	Advanced Circuit Analysis	3
EET 2140	Communications Electronics	3
EET 2141	Communications Electronics Laboratory	1
EET 2150	Electrical Machines Theory	3
EET 2162	Digital Electronics I	3
EET 2171	Projects Laboratory	1
ENG 1121	English Composition II	3
Subtotal		17
FOURTH SEMESTER		
EET 2220	Electronic Controls	3
EET 2251	Electric Machines Laboratory	1
EET 2262	Digital Electronics II	3
EET 2271	Circuit Analysis Laboratory	1
GenEd Elective ²	Flexible Core	3
GenEd Elective ²	Flexible Core	3
Subtotal		14
TOTAL CREDITS REQUIRED FOR THE DEGREE		67-69
EET 2000	Internship ³ (optional)	3

¹ Students without the math background for MAT 1375 will be required to take MAT 1175 and/or MAT 1275 prior to taking MAT 1375. This will increase the number of credits required for the degree by up to eight (8).

² In choosing Flexible Core classes, students must choose at least one Writing Intensive class. In addition, students planning to seek a BTech in Electrical Technology should consider requirements at that level when choosing courses, i.e. any course in World Cultures and Global Issues, any course in Creative Expression, ECON 1101 in US Experience in Its Diversity, or PHIL 2106 in Individual and Society.

³ Internship is an elective course that will allow students to gain some industrial experience and add three (3) credits to their degree. See prerequisites in the course description.

Bachelor of Technology in ELECTRICAL TECHNOLOGY

The curriculum in the baccalaureate program in Electrical Technology builds upon the skills learned in the first two years and adds more advanced study in the areas of signals and systems, microprocessors, sensors and instrumentation, power systems, mechatronics, and engineering technology management. With its complimentary design, graduates will be equipped to become active members in the industry and keep pace with the ever-changing field. The graduates work as electrical technologists.

There are several ways a student can enter the bachelor of technology program in Electrical Technology. Students may enter the program as freshmen if they meet the general college criteria for baccalaureate admissions. These students will follow the AAS curriculum for the first 67-69 credits and earn the AAS degree. Students may transfer in from the City Tech AAS program in electrical technology before or after completing the AAS degree. Students transferring from another college must have an AAS degree from an ABET-approved program with a GPA in their major courses of 2.5 or better. Non-ABET degrees will be evaluated course by course. Students with questions are advised to consult the Office of Admissions. Transcripts of entering students will be evaluated to determine the courses they must complete for the bachelor of technology degree. Please consult the department for further information. Students entering the program without the necessary background in mathematics, science and telecommunications will have to do additional work in these areas.

Students completing the degree program will obtain knowledge in power systems, controls, microcontrollers, sensors and instrumentation, as well as the growing area of mechatronics. Potential employers include IBM, CODEX, Bank of America, ITT, GE, ConEd, Verizon, MTA, Honeywell, and Northrop Grumman. Graduates may continue toward a master's degree in electrical engineering at City College or other institutions of higher learning.

The department will pursue ABET accreditation at the earliest possible time frame under ABET policy and procedures. Prospective students are advised that graduates are not eligible to receive maximum education/experience credits for the BTech as a "professional engineering program" toward New York State licensure in professional engineering until the program is ABET accredited. Additional work experience will be necessary to obtain a professional license. The contact information for ETAC-ABET is <http://www.abet.org/>.

The ETET department has established the following Program Educational Objectives (PEO) and Program Student Outcomes (PSO) for the Electrical Engineering Technology curriculum (BT degree).

Program Educational Objectives

1. Secure Gainful and meaningful careers as electrical engineering technologists.
2. Embark on careers of personal and professional growth.
3. Pursue life-long learning to enhance their undergraduate degree, through formal educations and/or certification in order to improve their careers.

Program Student Outcomes

General (Adopted from ETAC/ABET Criterion 3) Students demonstrate:

- a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;
- b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;

- c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;
- d. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;
- e. an ability to function effectively as a member or leader on a technical team;
- f. an ability to identify, analyze, and solve broadly-defined engineering technology problems;
- g. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
- h. an understanding of the need for and an ability to engage in self-directed continuing professional development;
- i. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
- j. a knowledge of the impact of engineering technology solutions in a societal and global context; and
- k. a commitment to quality, timeliness, and continuous improvement.

Discipline Specific

(Adopted from ETAC/ABET Program Criteria)

- a. the ability to analyze, design, and implement one or more of the following: control systems, instrumentation systems, communications systems, computer systems, or power systems;
- b. the ability to apply project management techniques to electrical/electronic(s) systems; and
- c. the ability to utilize differential and integral calculus, as a minimum, to characterize the performance of electrical/electronic systems.

GENERAL EDUCATION COMMON CORE		44-46 CREDITS
I – REQUIRED CORE¹ (14–15 CREDITS)		
English Composition (2 courses, 6 credits)		
ENG 1102	English Composition I	3
ENG 1121	English Composition II	3
Mathematical and Quantitative Reasoning (1 course, 4 credits)		
MAT 1375 ²	Precalculus or higher	4
Life and Physical Sciences (1 course, 4-5 credits)		
Select one of the following courses:		
PHYS 1433	General Physics I: Algebra Based	4
	or	
PHYS 1441	General Physics I: Calculus Based	5
II – FLEXIBLE CORE (6 COURSES, 20-21 CREDITS)		
Select two additional courses from approved lists in categories not met at the associate level.		
World Cultures and Global Issues		6
US Experience in its Diversity		
ECON 1101	Macroeconomics	3
Individual and Society		
PHIL 2106	Philosophy of Technology	3
Creative Expression		
Scientific World		

Select one of the following courses:

PHYS 1434	General Physics II: Algebra Based	4
	or	
PHYS 1442	General Physics II: Calculus Based	5

One addition course from any group

MAT 1475	Calculus I or higher	4
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III – COLLEGE OPTION REQUIREMENT³ (10 CREDITS)

- One course in Speech/Oral Communication
COM 1330⁴ Public Speaking or higher 3
- One interdisciplinary Liberal Arts and Sciences course
Any approved course 3
- Additional liberal arts to reach a total of at least 42 credits in general education, including one advanced course
MAT 1575 Calculus II 4

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 72 CREDITS

Associate-Level Courses

EET 1102	Techniques of Electrical Technology	2
EET 1122	Circuit Analysis I	4
EET 1202	Electrical Drafting	1
EET 1222	Circuit Analysis II	5
EET 1240	Electronics	4
EET 1241	Electronics Laboratory	1
EET 2122	Advanced Circuit Analysis	3
EET 2140	Communications Electronics	3
EET 2141	Communications Electronics Laboratory	1
EET 2150	Electric Machines Theory	3
EET 2162	Digital Electronics I	3
EET 2171	Projects Laboratory	1
EET 2220	Electronic Controls	3
EET 2251	Electric Machines Lab	1
EET 2262	Digital Electronics II	3
EET 2271	Circuits Analysis Lab	1
MAT 1375	Precalculus or higher	Met as GenEd
MAT 1475	Calculus I or higher	Met as GenEd
PHYS 1433	General Physics I: Algebra Based	
	or	
PHYS 1441	General Physics I: Calculus Based	Met as GenEd
PHYS 1434	General Physics II: Algebra Based	
	or	
PHYS 1442	General Physics II: Calculus Based	Met as GenEd

Baccalaureate-Level Courses

EET 3102	Signals and Systems	4
EET 3112	Advanced Microcontroller and Embedded System Design	3
EET 3122	Sensors and Instrumentation	3
EET 3202	Principles of Communications Systems	4
EET 3212	Control Systems	4
EET 3222	Power Electronics	3

EET 4102	Electrical Power Systems	3
EET 4112	Mechatronics	3
EET 4202	Digital Signal Processing	3
EET 4212	Capstone Project	3

Technical Electives 5-6

Students should select two technical electives from the following list in consultation with a faculty advisor:

TCET 3222	Satellite Transmission	3
TCET 4102	Fiber-Optic Communications	3
TCET 4132	Wireless Communications	3
TCET 4140	Telecommunications Network Management	3
EET 3132	Remote Sensing	3
EET 4120	Engineering Technology Management	2

ENG 2570	Writing in the Workplace	3
ENG 2575	Technical Writing	3
PHIL 2106	Philosophy of Technology	Met as GenEd
ECON 1101	Macroeconomics	Met as GenEd
MAT 1575	Calculus II	Met as GenEd
MAT 1372	Statistics with Probability	3
	or	
MAT 2572	Probability and Mathematical Statistics I	4

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 86-88

TOTAL NYSED LIBERAL ARTS/SCIENCE CREDITS 44-46

TOTAL CREDITS REQUIRED FOR THE DEGREE 130-134

1 Specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category. Students are advised that a different choice may result in additional credits being needed for graduation.

2 Students without the requisite math background to enter MAT 1375 must take MAT 1175 and/or, MAT 1275 in preparation, depending on initial placement. This will increase the number of required credits for the degree by 4-8.

3 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

4 Students who have already taken such a course at the associate level may take another liberal arts course instead.

5 If a student has already taken MAT 1575, then they may take MAT 2580 in its place.

Curriculum by Semester

For students earning a bachelor of technology (BTech) degree with a major in Electrical Technology.

FIFTH SEMESTER CREDITS

EET 3102	Signals and Systems	4
EET 3112	Microprocessor Applications	3
EET 3122	Sensors and Instrumentation	3
MAT 1575	Calculus II	4
ENG 2575	Technical Writing	3

Semester Total 17

SIXTH SEMESTER

EET 3202	Principles of Communications Systems	4
EET 3212	Control Systems	4
EET 3222	Power Electronics	3
MAT 1372	Statistics with Probability	3
	or	
MAT 2572	Probability and Mathematical Statistics I	4
COM 1330	Public Speaking	3

Semester Total 17-18

SEVENTH SEMESTER

EET 4102	Electrical Power Systems	3
EET 4112	Applied Mechatronics	3
	Technical Elective I ¹	2-3
	GenEd Elective ^{2,3} Flexible Core	3
	GenEd Elective ^{2,3} Flexible Core	3

Semester Total 14-15

EIGHTH SEMESTER

EET 4202	Digital Signal Processing	3
EET 4212	Capstone Project	3
	Technical Elective II ¹	3
ENG 2570	Writing in the Workplace	3
	College Option ³ Interdisciplinary Course	3

Semester Total 15

TOTAL CREDITS REQUIRED FOR THE DEGREE 64-65

1 Students should select these electives in consultation with the department Chairperson or Program Coordinator.

2 Overall Flexible Core choices for the AAS and BTech combined must include one each of the following: ECON 1101 in US Experience in Its Diversity, PHIL 2106 in Individual and Society, any course in World Cultures and Global Issues, and any course in Creative Expression. Students may make other choices in these categories but should be aware that doing so may increase the number of credits needed to graduate and affect financial aid.

3 Overall Flexible Core and College Option choices for the AAS and BTech combined must include at least two Writing Intensive courses.

Associate in Applied Science in TELECOMMUNICATIONS ENGINEERING TECHNOLOGY

This program prepares students to enter the rapidly expanding field of telecommunications and provides them with a wide range of skills needed for employment and continuing education in this high-tech industry as telecommunications technicians.

Two degree programs are available – an associate in applied science (AAS) in Telecommunications Engineering Technology, and a bachelor of technology (BTech) in Telecommunications Engineering Technology. [Click here](#) for information about the BTech program in the catalog.

Students in the associate degree program learn to install, test, maintain and operate a wide spectrum of telecommunication networks for voice, data and video transmission and networking, as well as to understand the technical principles and theories on which these devices and systems are based. The PC is used as an instructional tool throughout the curriculum. The theories of telephony, data communications and transmission are reinforced in up-to-date laboratories built in close collaboration with regional industry.

Graduates may work as communications engineering technicians and continue their education to earn a bachelor's degree. Additional job titles for AAS graduates include PBX technician, fiber optics technician, telecommunications service representative and field engineer, data communications technician, network operations technician and communications engineering technician. Employers of recent graduates include LIRR, MTA, Citicorp, Board of Education, Verizon, AST, Western Union, SIAC, Avaya, NYPD, JPMorgan Chase and IST.

To be admitted to the associate degree program of telecommunications engineering technology, an entering student must meet the CUNY proficiency requirements in reading and mathematics.

Accreditation

The program is accredited by the Engineering Technology Accreditation Commission of ABET, <http://www.abet.org/>

To accomplish its mission, the ETET department has established the following Program Educational Objectives (PEO) and Program Student Outcomes (PSO) for the Telecommunications Engineering Technology curriculum (AAS degree).

Program Educational Objectives

1. This degree will equip students to secure gainful and meaningful careers as telecommunications technicians.
2. Embark on careers of personal and professional growth.
3. Pursue life-long learning to enhance their undergraduate degree, through formal education and/or certification in order to improve their careers.

Program Student Outcomes

General (Adopted from ETAC/ABET Criterion 3)

Students demonstrate:

- a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;

- b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;
- c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;
- d. an ability to function effectively as a member of a technical team;
- e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;
- f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
- g. an understanding of the need for and an ability to engage in self-directed continuing professional development;
- h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and
- i. a commitment to quality, timeliness, and continuous improvement.

Discipline Specific

(Adopted from ETAC/ABET Program Criteria)

Students demonstrate knowledge and hands on competence in:

- PC a. the application of electric circuits, computer programming, associated software, analog and digital electronics, voice and data communications, and the principles of telecommunications systems in the solution of telecommunications problems.
- PC b. the applications of physics to telecommunications systems in a rigorous mathematical environment at or above the level of algebra and trigonometry.

[Click here for annual enrollment and graduation data](#)

GENERAL EDUCATION COMMON CORE ¹

28-30 CREDITS

I – REQUIRED CORE ² (4 COURSES, 14-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1375 ³	Precalculus or higher	4
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Life and Physical Sciences (1 course, 4-5 credits)

PHYS 1433	General Physics I: Algebra Based	4
PHYS 1441	General Physics I: Calculus Based	5

II – FLEXIBLE CORE (4 COURSES, 14-15 CREDITS)

Select any course from any two of the following groups	6
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World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Note: ECON 1101 Macroeconomics meets a baccalaureate degree requirement.

Creative Expression

Any Approved Course

Individual and Society

Any Approved Course

Note: PHIL 2106 Philosophy of Technology meets a baccalaureate degree requirement.

Scientific World

PHYS 1434*	General Physics II: Algebra Based	4
	or	
PHYS 1442*	General Physics II: Calculus Based	5

One additional course from any group

MAT 1475	Calculus I or higher	4
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Writing Intensive Requirement⁴

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

39 CREDITS

EET 1102	Techniques of Electrical Technology	2
EET 1122	Circuit Analysis I	4
EET 1222	Circuit Analysis II	5
EET 1240	Electronics	4
EET 1241	Electronics Laboratory	1
EET 2140	Communications Electronics	3
EET 2141	Communications Electronics Laboratory	1
EET 2162	Digital Electronics I	3
TCET 1100	Introduction to Telecommunications	2
TCET 2102	Analog and Digital Telephony	4
TCET 2202	Data Communications and Systems	4
TCET 2220	Transmission Systems	3
TCET 2242	Microcomputer Interfacing	3
MAT 1375	Precalculus or higher	Met as GenEd
PHYS 1433	General Physics I: Algebra Based	
	or	
PHYS 1441	General Physics I: Calculus Based	Met as GenEd
PHYS 1434	General Physics II: Algebra Based	
	or	
PHYS 1442	General Physics II: Calculus Based	Met as GenEd
MAT 1475	Calculus I	Met as GenEd

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 39

TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS 28-30

TOTAL CREDITS REQUIRED FOR THE DEGREE 67-69

1 Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.

2 Specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category. Students are advised that a different choice may result in additional credits being needed for graduation.

3 Students without the requisite math background to enter MAT 1375 must take MAT 1175 and/or MAT 1275 in preparation, depending on initial placement. This will increase the number of required credits for the degree by 4-8.

4 A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

Curriculum by Semester

For students earning an associate in applied science (AAS) degree with a major in Telecommunications Engineering Technology .

FIRST SEMESTER

CREDITS

EET 1102	Techniques of Electrical Technology	2
EET 1122	Circuit Analysis I	4
PHYS 1433	General Physics I: Algebra Based	
	or	
PHYS 1441	General Physics I: Calculus Based	4-5
MAT 1375 ¹	Precalculus	4
ENG 1101	English Composition I	3

Subtotal 17-18

SECOND SEMESTER

EET 1222	Circuit Analysis II	5
EET 1240	Electronics	4
EET 1241	Electronics Laboratory	1
TCET 1100	Introduction to Telecommunications	2
PHYS 1434	General Physics II: Algebra Based	
	or	
PHYS 1442	General Physics II: Calculus Based	4-5

Subtotal 16-17

THIRD SEMESTER

EET 2140	Communications Electronics	3
EET 2141	Communications Electronics Laboratory	1
EET 2162	Digital Electronics I	3
TCET 2102	Analog and Digital Telephony	4
MAT 1475	Calculus I	4
ENG 1121	English Composition II	3

Subtotal 18

FOURTH SEMESTER

TCET 2202	Data Communications and Systems	4
TCET 2220	Transmission Systems	3
TCET 2242	Microcomputer Interfacing	3
GenEd Elective ²	Flexible Core	3
GenEd Elective ²	Flexible Core	3

Subtotal 16

TOTAL CREDITS REQUIRED FOR THE DEGREE 67-69

TCET 2000 ³	Internship (optional)	3
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1 Students without the math background for MAT 1375 will be required to take MAT 1175 and/or MAT 1275 prior to taking MAT 1375. This will increase the number of credits required for the degree by up to eight (8).

2 In choosing Flexible Core classes, students must choose at least one Writing Intensive class. In addition, students planning to seek a BTech in Telecommunications Engineering Technology should consider requirements at that level when choosing courses, i.e. any course in World Cultures and Global Issues, any course in Creative Expression, ECON 1101 in US Experience in Its Diversity, or PHIL 2106 in Individual and Society. Students may make other choices in these categories but should be aware that doing so may increase the number of credits needed to graduate and affect financial aid.

3 Internship is an elective course that will allow students to gain some industrial experience and add three (3) credits to their degree. See prerequisites in the course description.

Bachelor of Technology in TELECOMMUNICATIONS ENGINEERING TECHNOLOGY

The curriculum in the baccalaureate program in Telecommunications Engineering Technology builds upon the skills learned in the first two years and adds more advanced study in data communications, coding, computer systems, probability and statistics, satellite transmission, fiber-optic communications, traffic control, economics, programming, network management, regulatory and legal issues and advanced mathematics. The graduates work as telecommunications technologists.

There are several ways a student can enter the bachelor of technology program in Telecommunications Engineering Technology. Students may enter the program as freshmen if they meet the general College criteria for baccalaureate admissions. These students will follow the AAS curriculum for the first 67 credits and earn the AAS degree. Students may transfer in from the City Tech AAS program in telecommunications engineering technology before or after completing the AAS degree. Students transferring from another college must have an AAS degree from an ABET-approved program with a GPA in their major courses of 2.5 or better. Non-ABET degrees will be evaluated course by course. Students with questions are advised to consult the Office of Admissions. Transcripts of entering students will be evaluated to determine the courses they must complete for the bachelor of technology degree. Please consult the department for further information.

Students entering the program without the necessary background in mathematics, science and telecommunications will have to do additional work in these areas.

BTech degree holders may obtain positions such as technical operations manager, network designer, systems technologist, traffic analyst, data communications manager and telecommunications consultant.

Employers of recent graduates include LIRR, Citicorp, MTA, Board of Education, AST, Western Union, SIAC, Verizon, JPMorgan Chase, IST and NYPD. Graduates may continue toward a master's degree in electrical engineering at City College or other institutions of higher learning.

Accreditation

The program is accredited by the Engineering Technology Accreditation Commission of ABET, <http://www.abet.org/>

To accomplish its mission, the ETET department has established the following program educational objectives (PEO) and Program Student Outcomes (PSO) for the Telecommunications Engineering Technology curriculum (BT degree).

Program Educational Objectives

1. This degree will equip students to secure gainful and meaningful careers as telecommunications engineering technologists.
2. Embark on careers of personal and professional growth.
3. Pursue life-long learning to enhance their undergraduate degree, through formal education and/or certification in order to improve their careers.

Program Student Outcomes

General (Adopted from ETAC/ABET Criterion 3)

Students demonstrate:

- a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;

- b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
- c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;
- d. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;
- e. an ability to function effectively as a member or leader on a technical team;
- f. an ability to identify, analyze, and solve broadly-defined engineering technology problems;
- g. an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature;
- h. an understanding of the need for and an ability to engage in self-directed continuing professional development;
- i. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
- j. a knowledge of the impact of engineering technology solutions in a societal and global context;
- k. a commitment to quality, timeliness, and continuous improvement.

Discipline Specific

(Adopted from ETAC/ABET Program Criteria)

Students demonstrate:

- PC a. an ability to analyze, design, and implement telecommunications systems.
- PC b. an ability to analyze and implement switching technologies, wide area network technologies, and policy.
- PC c. an ability to manage, design, and plan wide area networks.
- PC d. an ability to utilize statistics/probability, transform methods, or applied differential equations in support of telecommunications systems and wide area networks.
- PC e. the ability to apply project management techniques in the design, maintenance, and implementation of telecommunication systems

[Click here for annual enrollment and graduation data](#)

GENERAL EDUCATION COMMON CORE

46 CREDITS

I – REQUIRED CORE¹ (4 COURSES, 14-15 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101*	English Composition I	3
ENG 1121*	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1375*, ²	Precalculus or higher	4
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Life and Physical Sciences (1 course, 4-5 credits)

PHYS 1433*	General Physics I: Algebra Based	4
PHYS 1441*	General Physics I: Calculus Based	5

II – FLEXIBLE CORE (6 COURSES, 20-21 CREDITS)

Select two additional courses in categories not met at the associate level. 6

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

ECON 1101 Macroeconomics 3

Individual and Society

PHIL 2106 Philosophy of Technology 3

Creative Expression

Any Approved Course

Scientific World

PHYS 1434* General Physics II: Algebra Based 4

or
PHYS 1442* General Physics II: Calculus Based 5

One additional course from any group

MAT 1475 Calculus I or higher 4

III – COLLEGE OPTION REQUIREMENTS³ (10-13 CREDITS)

• One course in Speech/Oral Communication
COM 1330⁴ Public Speaking or higher 3

• One interdisciplinary Liberal Arts and Sciences course
Any Approved Course 3

• Additional liberal arts credits to reach a total of at least 42 credits in general education, including one advanced course.
MAT 1575 Calculus II 4
[PHIL 3212⁵ Engineering Ethics 3]

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS 84 CREDITS**Associate-Level Courses**

EET 1102	Techniques of Electrical Technology	2
EET 1122	Circuit Analysis I	4
EET 1222	Circuit Analysis II	5
EET 1240	Electronics	4
EET 1241	Electronics Laboratory	1
EET 2140	Communications Electronics	3
EET 2141	Communications Electronics Laboratory	1
EET 2162	Digital Electronics I	3
TCET 1100	Introduction to Telecommunications	2
TCET 2102	Analog and Digital Telephony	4
TCET 2202	Data Communications and Systems	4
TCET 2220	Transmission Systems	3
TCET 2242	Microcomputer Interfacing	3

MAT 1375	Precalculus or higher	Met as GenEd
PHYS 1433	General Physics I: Algebra Based	
PHYS 1441	General Physics I: Calculus Based	Met as GenEd
PHYS 1434	General Physics II: Algebra Based	
PHYS 1442	General Physics II: Calculus Based	Met as GenEd
MAT 1475	Calculus I or higher	Met as GenEd

Baccalaureate-Level Courses

TCET 3102	Analog and Digital Communications I	4
TCET 3122	Switching and Automata Theory	3
TCET 3142	Computer Systems	3
TCET 3202	Analog and Digital Communications II	4
TCET 3222	Satellite Transmission	3
TCET 4102	Fiber-Optic Communications	3
TCET 4132	Wireless Communication	3
TCET 4140	Telecommunications Network Management	3
TCET 4202	Advanced Telecommunications	3
TCET 4182	Telecommunications Capstone Project I	2
TCET 4282	Telecommunications Capstone Project II	2
CST 2403	Intro C++ Programming Language I	3
ENG 2570	Writing in the Workplace	3
ENG 2575	Technical Writing	3
ECON 1101	Macroeconomics	Met as GenEd
MAT 1372	Statistics with Probability	3
MAT 1575	Calculus II	Met as GenEd
PHIL 2106	Philosophy of Technology	Met as GenEd
PHIL 3212 ⁵	Engineering Ethics	Met as GenEd

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES 84

TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS 47-49

TOTAL CREDITS REQUIRED FOR THE DEGREE 131-133

* Courses required for associate degree

1 Specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category. Students are advised that a different choice may result in additional credits being needed for graduation.

2 Students without the requisite math background to enter MAT 1375 must take MAT 1175 and/or MAT 1275 in preparation, depending on initial placement. This will increase the number of required credits for the degree by 4-8.

3 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).

4 Students who have already taken such a course at the associate level may take another liberal arts course instead.

5 PHIL 2103 is a potential substitute for PHIL 3212.

Curriculum by Semester

For students earning a bachelor of technology (BTech) degree with a major in Telecommunications Engineering Technology .

FIFTH SEMESTER		CREDITS
TCET 3102	Analog and Digital Communications I	4
TCET 3122	Switching and Automata Theory	3
TCET 3142	Computer Systems	3
MAT 1575	Calculus II	4
ENG 2575	Technical Writing	3
Subtotal		17
SIXTH SEMESTER		
TCET 3202	Analog and Digital Communications II	4
TCET 3222 ¹	Satellite Transmission	3
GenEd Elective ^{2,3}	Flexible Core	3
MAT 1372	Statistics with Probability	3
ENG 2570	Writing in the Workplace	3
Subtotal		16
SEVENTH SEMESTER		
TCET 4102	Fiber-Optic Communications	3
TCET 4120	Legal and Regulatory Issues in Telecommunications	2
TCET 4140	Telecommunications Network Management	3
CST 2403	Intro C++ Programming Language Part I	3
GenEd Elective ^{2,3}	Flexible Core	3
Subtotal		14
EIGHTH SEMESTER		
TCET 4202	Advanced Telecommunications	3
TCET 4282	Telecommunications Capstone Project II	2
ACC 1162	Elements of Accounting	3
COM 1330	Public Speaking or higher	3
College Option	Interdisciplinary Course	3
PHIL 3212	Engineering Ethics	3
Subtotal		17
TOTAL CREDITS REQUIRED FOR THE DEGREE		64
TCET 4000 ⁴	Internship (optional)	3

¹ Students must take TCET 2220 as a prerequisite for TCET 3222 if not taken in AAS.

² Overall Flexible Core choices for the AAS and BTech combined must include one each of the following: ECON 1101 in US Experience in Its Diversity, PHIL 2106 in Individual and Society, any course in World Cultures and Global Issues, and any course in Creative Expression.

³ Overall Flexible Core and College Option choices for the AAS and BTech combined must include at least two Writing Intensive courses.

⁴ Internship is an elective course that will allow students to gain industrial experience and add three (3) credits to their degree. See prerequisites in the course description.

Based on a thorough study of trends in modern telecommunications technology and the present and future job markets in this area, the Department of Electrical and telecommunications engineering technology is offering the following three tracks (areas of concentration) within the existing baccalaureate program in Telecommunications Engineering Technology: wireless communications, optical communications and telecommunications network management. Students can choose either the general BTech program or any of these areas of concentrations. The general BTech program is recommended for those students who want to obtain a general well-integrated education in telecommunications technology. For those students who are interested in a deeper specialization, one of the tracks is recommended.

REQUIRED COURSES IN THE WIRELESS COMMUNICATIONS TRACK		CREDITS
TCET 3102	Analog and Digital Communications I	4
TCET 3122	Switching and Automata Theory	3
TCET 3142	Computer Systems	3
TCET 3222	Satellite Transmission	3
TCET 3202	Analog and Digital Communications II	4
TCET 4102	Fiber-Optic Communications	3
TCET 4110	Electromagnetics and Antenna Design	3
TCET 4132	Wireless Communications	3
TCET 4202	Advanced Telecommunications	3
TCET 4210	Fundamentals of Microwave Remote Sensing	3
Technical Elective	Click here for choices	4
Subtotal		36
ADDITIONAL REQUIRED COURSES		
CST	Elective	3
ENG 2570	Writing in the Workplace	3
ENG 2575	Technical Writing	3
CET 4942	Economics of Engineering and Management	3
MAT 1372	Statistics with Probability	3
MAT 1575 ¹	Calculus II	4
PHIL 3212	Engineering Ethics	3
Subtotal		22
REMAINING CORE DISTRIBUTION		6
TOTAL CREDITS REQUIRED FOR THE DEGREE		64
REQUIRED COURSES IN THE OPTICAL COMMUNICATIONS TRACK		CREDITS
TCET 3102	Analog and Digital Communications I	4
TCET 3122	Switching and Automata Theory	3
TCET 3142	Computer Systems	3
TCET 3222	Satellite Transmission	3
TCET 3202	Analog and Digital Communications II	4
TCET 4152	Optical Network Components	3
TCET 4162	Photonic Devices	3
TCET 4132	Wireless communications	3
TCET 4202	Advanced Telecommunications	3
TCET 4232	Optical Networks	3
Technical Elective	Click here for choices	4
Subtotal		36

ADDITIONAL REQUIRED COURSES

CST	Elective	3
ENG 2570	Writing in the Workplace	3
ENG 2575	Technical Writing	3
CET 4942	Economics of Engineering and Management	3
MAT 1372	Statistics with Probability	3
MAT 1575 ¹	Calculus II	4
PHIL 3212	Engineering Ethics	3

Subtotal **22**

REMAINING CORE DISTRIBUTION **6**

TOTAL CREDITS REQUIRED FOR THE DEGREE **64**

REQUIRED COURSES IN THE NETWORK MANAGEMENT TRACK**CREDITS**

TCET 3102	Analog and Digital Communications I	4
TCET 3122	Switching and Automata Theory	3
TCET 3142	Computer Systems	3
TCET 3242	Advanced Communication Network	3
TCET 4102	Fiber-Optic Communications	3
TCET 4140	Telecom Network Management	3
TCET 4120	Legal and Regulatory Issues in Telecom	2
TCET 4172	Telecommunications Protocols and Network Performance	3
CST 3610	Network Security Fundamentals	3
TCET 4282	Telecommunications Capstone Project II	2
CST	Elective	3
Technical Elective	Click here for choices	4

Subtotal **36**

ADDITIONAL REQUIRED COURSES

CST	Elective	3
ENG 2570	Writing in the Workplace	3
ENG 2575	Technical Writing	3
CET 4942	Economics of Engineering and Management	3
MAT 1372	Statistics with Probability	3
MAT 1575 ¹	Calculus II	4
PHIL 3212	Engineering Ethics	3

Subtotal **22**

REMAINING CORE DISTRIBUTION **6**

TOTAL CREDITS REQUIRED FOR THE DEGREE **64**

¹ Students without the mathematics background for MAT 1575 will be required to complete MAT 1175, MAT 1275, MAT 1375 and/or MAT 1475, increasing the credits required for graduation.

These tracks differ from the general BTech program by offering two or three specialized courses and two technical elective courses while preserving the total number of required credits. In addition, Engineering Ethics is offered, among other required courses.

LIST OF ELECTIVE (ELECT) COURSES**TECHNICAL ELECTIVES AS THEY APPLY TO EACH TRACK****TCET ELECT**

TCET 3202	Analog and Digital Communications II
TCET 3242	Advanced Communication Network
TCET 4110	Electromagnetics and Antenna Design
TCET 4132	Wireless Communications
TCET 4152	Optical Network Components
TCET 4120	Legal and Regulatory Issues in Telecommunications
TCET 4140	Telecommunications Network Management
TCET 4162	Photonic Devices
TCET 4172	Telecommunications Protocols and Network Performance
TCET 4210	Remote Sensing
TCET 4232	Optical Networks
TCET 4202	Advanced Telecommunications
TCET 4282	Telecommunications Capstone Project II
TCET 4000	Internship

CST ELECT

CST 2403	Intro C++ Programming Language I
CST 2406	Introduction to Systems Analysis and Design
CST 2410	Introduction to Computer Security
CST 2801	Special Topics in Information Technology
CST 3503	C++ Programming II
CST 3504	Database Design
CST 2309	Web Programming I
CST 3603	Object-Oriented Programming
CST 3604	Quality Database Implementation
CST 2409	Web Programming II
CST 3610	Network Security
CST 4703	UNIX Networking and the Internet
CST 4704	Data Warehousing
CST 4706	Software Development Methodologies
CST 4710	Advanced Network Security

MAT ELECT

MAT 3787	Applied Mathematics: Finite Fields
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OTHER ELECTIVE COURSES

ELECT	Electives with Department Approval
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COURSES:

EET 1102 Techniques of Electrical Technology

1 cl hr, 2 lab hrs, 2 cr

An introduction to the use of computers for analysis of electrical and electronic circuits by using state-of-the-art software for computer simulation of circuits.

Pre- or corequisite: MAT 1175 or higher

EET 1122 Circuit Analysis I

3 cl hrs, 3 lab hrs, 4 cr

Introduction to dc circuits. Topics include series, parallel and series-parallel circuits, network theorems, equivalent circuits, capacitive and inductive circuits, timing circuits and measuring instruments. Laboratory experiments include breadboarding, measurement techniques and troubleshooting. The writing of laboratory reports is taught and written reports are required.

Pre- or corequisites: EET 1102, MAT 1275 or higher, PHYS 1433 or PHYS 1441

EET 1202 Electrical Drafting

3 lab hrs, 1 cr

This course provides the student with the fundamental knowledge and skills involved in modern electrical drafting. Practical applications in the electrical and electronic disciplines are discussed and implemented using CAD procedures and software.

Pre- or corequisite: EET 1102

EET 1222 Circuit Analysis II

4 cl hrs, 2 lab hrs, 5 cr

Analysis of ac circuits with sine-wave sources and R L C circuit components covering phase shift, frequency response, power and resonance in series and parallel circuits. Three-phase wye and delta circuits are also covered. Hands-on laboratory experiments are included.

Prerequisite: EET 1122; Pre- or corequisites: MAT 1375 or higher, ENG 1101, PHYS 1434 or PHYS 1442

EET 1240 Electronics

4 cl hrs, 4 cr

Characteristics and applications of semiconductor elements such as diodes, bipolar junction transistors

and field effect transistors are covered. Applications include dc power supplies, voltage regulators, small signal amplifiers (single and multi-stage) and operational amplifiers.

Pre- or corequisite: EET 1222

EET 1241 Electronics Laboratory

3 lab hrs, 1 cr

Experiments based on material in EET 1240 give the students experience in using the oscilloscope, signal generator and function generator for analyzing and testing electronic circuits.

Pre- or corequisites: EET 1240, EET 1222

EET 2000 Internship

2 cl hrs bi-wkly: 130-field hrs/ semester, 3 cr

Ten hours per week of assigned field/study work applying classroom principles and theory to real-world electrical engineering technology problems. Interns assist engineers in building and testing circuits, performing hardware and software diagnostics, testing/measurements and preventive maintenance as well as generating supporting documentation. Students must maintain a log/journal to be shared in group seminars.

Prerequisites: Completion of all third-semester courses with a GPA of 2.8 or better and approval of the department internship director

EET 2122 Advanced Circuit Analysis

2 cl hrs, 2 lab hrs, 3 cr

Transient response of RL, RC and RLC circuits utilizing both classical and Laplace transform techniques. Laboratory exercises and computer simulation software included.

Prerequisite: EET 1222; Corequisite: MAT 1475 or higher
Equivalent to old course EET 2120

EET 2140 Communications Electronics

3 cl hrs, 3 cr

An intermediate course in theory and applications of modern electronics in communications. Filters, oscillators, transmitters and receivers as applied to amplitude-modulation and frequency-modulation transmission systems

are discussed. Introduction to noise and its effect on communications electronics is given.

Prerequisite: EET 1240

EET 2141 Communications Electronics Laboratory

3 lab hrs, 1 cr

An intermediate course in developing skills required of technicians in experimenting with electronic circuits, interpreting and analyzing data to verify principles and writing technical reports. Experiments in application of transistors, diodes, integrated circuits, resonant circuits, radio frequency voltage and power amplifiers, oscillators, amplitude modulation and demodulation are performed.

Prerequisite: EET 1241; Pre- or corequisite: EET 2140

EET 2150 Electric Machines Theory

3 cl hrs, 3 cr

Principles and characteristics of dc and ac machines. Topics include dc generators and motors, construction characteristics and ratings, alternators, transformers polyphase induction motors, single-phase motors and synchronous motors.

Prerequisites: EET 1222, PHYS 1433 or PHYS 1441

EET 2162 Digital Electronics 1

2 cl hrs, 3 lab hrs, 3 cr

Fundamentals of digital electronics using Boolean algebra, truth tables, Karnaugh maps and waveforms to analyze and understand digital logic circuit design. Logic gates (AND, NAND, OR, NOR, EX-OR), binary arithmetic, flip-flops, counters and registers are analyzed in experiments.

Prerequisites: EET 1240, EET 1241

EET 2171 Projects Laboratory

3 lab hrs, 1 cr

A basic course in the use of specialized tools and fabrication techniques as related to electrical and electronic circuit fabrication with simulation software. Layout and fabrication of printed circuits are covered.

Prerequisites: EET 1202, EET 1241

EET 2220 Electronic Controls

3 cl hrs, 3 cr

The course introduces discrete and continuous control systems. Open-loop and closed-loop systems are analyzed. Laplace transforms and other advanced mathematical techniques are applied to servomechanisms and power control. Instrumentation for feedback systems and other topics are discussed.

Prerequisites: EET 2122, MAT 1475 or higher

EET 2251 Electric Machines Laboratory

3 lab hrs, 1 cr

Experiments are performed to enhance the understanding of the principles of operation of machines studied in EET 2150 to develop proficiency in wiring the machines and associated controls, checking circuitry and using power test equipment in report writing.

Prerequisite: EET 2150

EET 2262 Digital Electronics II

2 cl hrs, 3 lab hrs, 3 cr

Theory and hands-on experience with microprocessors using assembly language are covered. Emphasis on usage of serial and parallel ports interfacing a digital controller to other devices.

Prerequisite: EET 2162; Pre- or corequisite: EET 2271

EET 2271 Circuit Analysis Laboratory

3 lab hrs, 1 cr

Covers analytical and measurement techniques to evaluate a digital project. Each student is assigned an individual project consisting of designing a circuit, breadboarding the design and performing various tests and analyses with formal report and presentation.

Prerequisite: EET 2171; Pre- or corequisite: EET 2162

EET 3102 Signals and Systems

3 cl hrs, 3 lab hrs, 4 cr

This course introduces the students to the modeling concepts on signal and system. A variety of numerical and symbolic methods on discrete and analog systems, synthesis and analysis are explored using software

industrial standard packages such as Matlab and Simulink. Relevant examples from Engineering Electrical Technology as well as Industrial design are presented and discussed.
Prerequisite: AAS degree in EET or department approval; *Pre- or corequisite:* MAT 1575

EET 3112 Advanced Microcontroller and Embedded System Design

2 cl hrs, 3 lab hrs, 3 cr
An in-depth exploration of microcontroller systems, including architecture, interface, and applications. In this hands-on course, students spend a considerable amount of time in the lab experimenting with the microcontroller, and gain significant experience in using a PIC-based microcontroller to input information from users, via buttons and switches, and output information using LEDs and LCD displays. Toward the end of the semester, students design and develop an embedded system for different applications. Both assembly and C/C++ languages are used during the lab and assignments
Prerequisite: AAS degree in EET or department approval *Corequisite:* EET 3102

EET 3122 Sensors and Instruments

2 cl hrs, 2 lab hrs, 3 cr
An introduction to the world of electrical and optical sensors with applications in bioengineering, environmental remote sensing fields and many more. The topics cover description of sensor performance, temperature sensors, light sensors, force sensors, displacement sensors, motion sensors, environmental sensors, sound sensors, chemical sensors, sensor interfacing, instrumentation techniques and switching mechanisms. The lab component of this course introduced sensors control using NI LabView software and NI ELVIS hardware.
Prerequisites: AAS degree in EET or department approval; *Pre- or corequisite:* EET 3102

EET 3132 Remote Sensing

2 cl hrs, 2 lab hrs, 3 cr
This course highlights the physical and mathematical principles underlying remote sensing techniques, covering the radiative transfer equation, atmospheric

sounding techniques, interferometric and lidar systems, and an introduction to image processing. The lab component introduces remote sensing software HYDRA, and MATLAB, used for image display and data analysis.
Prerequisites: MAT 1475 or higher and PHYS 1434 or PHYS 1442

EET 3202 Principles of Communications Systems

3 cl hrs, 3 lab hrs, 4 cr
The course deals with principles of analog and digital communications. Amplitude, frequency, and phase modulation techniques are covered. Fundamental parameters of digital communication systems, various modulation techniques such as pulse code modulation (PCM) and delta modulation (DM) and their performance in terms of bandwidth efficiency and signal to noise ratio (SNR), line coding and pulse shaping are analyzed. Introduction to information theory and error correcting codes such as block coding and convolutional coding. Emerging technologies. Experiments dealing with AM, FM, PCM, DM, and line coding are parts of laboratory exercises.
Prerequisite: EET 3102; *Pre- or corequisite:* MAT 1372 or MAT 2572

EET 3212 Control Systems

3 cl hrs, 3 lab hrs, 4 cr
An introduction to various issues regarding Control Systems with focus on computer techniques and software systems available in industrial and commercial environment to solve control engineering technology problems. MATLAB and Simulink are important packages utilized to solve systems control problems.
Prerequisite: EET 3102, MAT 1575 or higher

EET 3222 Power Electronics

2 cl hrs, 3 lab hrs, 3 cr
An introduction to applications of circuit theory and fundamental electronics to a wide variety of electronics that deliver power to consumer and industrial loads. It focuses on power semiconductors, the conversion between DC and AC sources, the interface with the utility line and switching power supply. Multism or CAD's Pspice and laboratory experiments are used to

illustrate the principles covered by the text.

Prerequisite: EET 3102

EET 3572 Embedded Systems Fundamentals and Applications in Robotics

2 cl hrs, 3 lab hrs, 3 cr
Introduces students in the MECH, CET, and EET programs to the applications of embedded systems in designing basic robotic systems or smart devices. Hands-on design activities help students to build prototypes for various robotic applications.
Prerequisite: GPA of 2.8 or higher and EET students only: EET 3112
Pre- or corequisite: CET students only: CET 3510; MECH students only: MECH 3500

EET 4102 Electrical Power Systems

3 cl hrs, 3 cr
This course examines power that may be generated from natural sources such as hydroelectricity, wind, and solar as alternatives to the current drain on hydrocarbon resources such as oil and natural gas that are environmentally unfriendly. The course also considers how this energy is distributed to the consumer by considering physical, safety, and economic limitations.
Prerequisite: EET 3222

EET 4112 Applied Mechatronics

2 cl hrs, 2 lab hrs, 3 cr
Students design and fabricate devices using basic components of electronics and optics as applied to mechatronics. Measurements with various sensors (strain gages, thermocouples, piezoelectric transducers, LVDT's, optoelectronic proximity sensors, etc.) are performed. Digital principles are studied and their applications in A/D and D/A converters, microcontrollers and programmable-logic controllers (PLCs) are demonstrated.
Prerequisite: EET 3212

EET 4120 Engineering Technology Management

2 cl hrs, 2 cr
Development of basic management skills needed throughout students' careers. Topics include the historical development and the functions of management from planning and decision making

to organizing, staffing, leading, motivating, and controlling. The nature and application of management principles throughout the technology product/project life cycles are covered. Students also learn about the transition from a technical performer to technical management, the position of women and minorities in engineering management, effective time management, and the importance of professional ethics and conduct.

Prerequisite: EET 3212

EET 4202 Digital Signal Processing

2 cl hrs, 2 lab hrs, 3 cr
A course that introduces senior students to the principles and applications of Digital Signal Processing (DSP). DSP continues to play a major role in diverse areas of science and engineering technology including telecommunications, digital media, biomedicine, and digital instrumentation. This course covers sinusoids, spectrum representation, discrete-time signals and systems, sampling and aliasing, analog-to-digital and digital-to-analog conversion, FIR & IIR filters and frequency response, and ztransforms. This course also provides various labs introducing MATLAB as a tool for the design, simulation, and visualization of digital signal processing (DSP) systems.
Prerequisite: EET 4112

EET 4212 Capstone Project

2 cl hrs, 2 lab hrs, 3 cr
In this capstone project course students integrate principles, theories, and skills learned in previous courses to the solution of a realistic engineering technology problem. This course helps students to develop design & troubleshooting methodology, effective teamwork, project management, and technical writing & presentation skills. Students also learn and utilize a variety of technology for accomplishing engineering technology analysis and synthesis through their project. In addition, each team meets regularly with their faculty advisors for design review and progress reports.
Prerequisite: EET 4112 and department approval; *Pre- or corequisite:* EET 4202

EET 4242
Remote Sensing (Special Topics)

2 cl hrs, 2 lab hrs, 3 cr

An advanced remote sensing course introducing the students to earth surveillance systems and kernel methods used in analysis of images of the Earth acquired airborne and satellite sensors that improve detection with real-life applications like natural resource control, detection and monitoring of anthropic infrastructures structures (urban areas), agriculture inventorying, disaster prevention and damage assessment, anomaly and target detection, biophysical parameter estimation, etc.

Prerequisites: EET 3132, MAT 1575 or higher, MAT 2580

EET 3672
Actuators and Sensors Application in Robotics

2 cl hrs, 3 lab hrs, 3 cr

An elective in the robotic concentration for the MECH, CET, and ETET programs for students who want to develop expertise in mechatronic product design and development. Teaches the design of robots and smart devices or systems using various sensor and actuators. *Prerequisite:* EET students: EET 3122 *Pre- or corequisite:* non-EET students: CET 3615 or MECH 3572

EET 4772
Control Systems in Robotics

2 cl hrs, 3 lab hrs, 3 cr

An elective course in the robotic concentration for the MECH, CET, and ETET programs. It provides a solid foundation in general robotic systems control for the design of smart mechanical devices with proper PID control techniques. It further enhances students' ability to engage in robotics and in new smart device development and testing. *Prerequisite:* MECH 3672 or CET 3625 or EET 3212. *Corequisite:* MECH students only: MECH 4760

EET 4872
Robotic Systems Design and Applications

2 cl hrs, 3 lab hrs, 3 cr

An elective course in the robotic concentration or the MECH, CET, and ETET programs. It provides an opportunity for students to engage in design and application of robotic technology to create new products

and to design industrial and consumer robots.

Prerequisite: non-EET students: MECH 4772 or EET 4112. *Pre- or corequisite:* CET students only: CET 4864

ETN 1102
Principles of Electricity and Electronics
(for non-ET/TC majors)

3 cl hrs, 3 lab hrs, 4 cr

An introduction to the principles of electricity and electronics, dc circuit theory, problem-solving using Ohm's Law in series, parallel and series-parallel resistive, capacitive and inductive circuit elements excited by a sinusoidal waveform. Transistor and solid-state linear and digital circuits and fractional horsepower ac and dc motors are also studied. Laboratory exercises introduce students to various types of electronic equipment.

Prerequisite: MAT 1275 or higher

ETN 1202
Principles of Computer Maintenance
(for non-ET/TC majors)

3 cl hrs, 3 lab hrs, 4 cr

This course concerns the hardware aspects of computers and computer architecture. Processor units, monitors, keyboards and peripherals are studied. Maintenance, repair and software system upgrade in practical approach are introduced to students. Laboratory experiments and projects support the theory.

Prerequisite: ETN 1102 or PHYS 1442

ETN 1302
Principles of Electricity, Electronics and Computer Operation
(for non-ET/TC majors)

2 cl hrs, 4 lab hrs, 4 cr

An introduction to the principles of electricity and electronics, dc and ac circuit theory, capacitive and inductive circuit elements. Transistor and solid state linear and digital circuits and introduction to computer hardware and operating systems. Laboratory exercises introduce the student to various types of electronic and computer equipment.

Prerequisite: MST 1205 or CST 1205; *Corequisite:* MAT 1375 or higher

TCET 1100
Introduction to Telecommunications

2 cl hrs, 2 cr

The basic concepts of telecommunications begin with a survey of communications systems using the concepts of transmitter, receiver, transmission medium and information. Electrical representation of information and the distinction between analog and digital transmission are discussed. The evolution of the public telephone network is considered, with a focus on its topology and switching technologies. Various kinds of information sources are considered such as voice, data, video, signaling and switching, with a discussion of how each type is transmitted through the network. Concludes with a general discussion of data transmission including an introduction to digital services.

Prerequisite: CUNY proficiency in reading

TCET 2000
Internship
(for TCET-AAS program)

2 cl hrs bi-wkly, 130 field hrs per semester, 3 cr

Ten hours per week of assigned field/study work applying classroom principles and theory to real-world telecommunications technology problems. An intern works as a technician to assist engineers and network administrators, build LAN networks, install hardware/software, perform online and offline testing and generate supporting documentation. Students must maintain a log/journal to be shared in group seminars.

Prerequisites: Completion of all third-semester courses with a GPA of 2.8 or higher and approval of the department internship director

TCET 2102
Analog and Digital Telephony

3 cl hrs, 3 lab hrs, 4 cr

This course is an introduction to modern telephone networks and interfaces. Telephone sets, the central office and the Public Switched Telephone Networks are discussed in detail. Private (PBX) and public switches, both digital and analog, are discussed, with emphasis on features, signaling and technology. Concludes with

the transmission of audio signals through different networks. Laboratory experiments supplement the course and expose students to the fundamentals of telephony.

Prerequisite: TCET 1100; *Corequisites:* EET 2140, EET 2162, PHYS 1433 or PHYS 1441

TCET 2202
Data Communication Systems

3 cl hrs, 3 lab hrs, 4 cr

Introduction to analog and digital communications systems, synchronous transmission of information and binary transmission. Multiplexing and various binary codes used in communication systems are explored. Distortion, noise and test equipment are discussed. Modems are analyzed. The RS 232 interface, protocols and line testing (loopback, analog and digital) are covered. Laboratory exercises emphasize fault isolation and systems troubleshooting techniques. The protocol analyzer is used for monitoring, troubleshooting and emulation. *Prerequisite:* TCET 2102; *Pre- or corequisite:* TCET 2242 or EET 2262

TCET 2220
Transmission Systems

3 cl hrs, 3 cr

Introduction to the analysis of microwave communications and systems. Transmission line theory, the Smith chart and mathematical analysis are incorporated. Various transmission media such as two-wire, twisted telephone wires, coaxial cable, waveguides, fiber and satellite are studied. Study of microwave components, Tee connectors, attenuators, slotted lines and cavities are included. Antenna design and radio-wave propagation are also covered (introduced). Concludes with a study of microwave applications and systems.

Prerequisite: EET 2140; *Pre- or corequisite:* MAT 1475 or higher

TCET 2242
Microcomputer Interfacing

2 cl hrs, 3 lab hrs, 3 cr

An introduction to assembly language and programming of microprocessors. The design of memory and microprocessor I/O interfaces. Laboratory experiments provide training in interrupts, masking, counters, timers, flashing

and moving messages, BSC model and encoders/decoders. Serial and parallel ports are studied and practical experiments utilizing switches, LED's and speakers are performed.

Prerequisite: EET 2162

TCET 3102 Analog and Digital Communications I

3 cl hrs, 3 lab hrs, 4 cr

The course introduces basic concepts in analog and digital communications. Topics covered include spectral analysis of electrical signals, Fourier series, Fourier transform, signal and noise filtering and amplification. Amplitude, frequency and phase modulation techniques as well as amplitude and pulse-code modulation in Analog to Digital converters are covered. Introduction to traffic engineering is studied in the laboratory.

Prerequisites: AAS in TCET or department approval

TCET 3122 Switching and Automata Theory

2 cl hrs, 3 lab hrs, 3 cr

The course covers synchronous state machines. VHDL techniques are used to cover state transition analysis, synthesis and optimization techniques. VHDL concepts are used to develop simulation waveshapes of all of the circuits involved. The course is concerned with the study of combinational networks, counters, shift registers and sequential machines.

Prerequisite: AAS in TCET or department approval

TCET 3142 Computer Systems

2 cl hrs, 3 lab hrs, 3 cr

The skills needed to install, configure and troubleshoot a computer network are covered. A wide range of materials including with computer hardware, operating systems, wiring, protocols and installation are discussed. Troubleshooting various networks utilizing engineering analysis tools is covered. Discovering practical problems in interfacing computer networks in various configurations is covered in the laboratory.

Prerequisite: AAS in TCET or department approval

TCET 3202 Analog and Digital Communications II

3 cl hrs, 3 lab hrs, 4 cr

Theory and practice of transmission and filtering of analog and digital signals are covered. Fundamental parameters of digital communication systems, various modulation techniques such as Pulse Code Modulation (PCM) and Delta Modulation (DM) and their performance in terms of bandwidth efficiency and signal-to-noise ratio (SNR), line coding and pulse shaping are analyzed. Introduction to information theory and error-correcting codes such as block coding and convolutional coding. Emerging technologies. Software simulation and hard-wired experiments dealing with PCM, DM and line coding are parts of laboratory exercises.

Prerequisites: TCET 3102, TCET 3122

TCET 3222 Satellite Transmission

2 cl hrs, 3 lab hrs, 3 cr

An overview of the basic concepts and techniques used in satellite communications is introduced. The three major segments of a satellite system, the space segment, the earth segment and the link between these segments, are described. A short introduction to satellite launching, followed by a discussion of the methods of determining antenna look angles. The antenna gain and beam-width equations are examined, with emphasis on the parabolic antenna. Uplink and downlink budgets are examined. Carrier-to-noise ratio, bit energy-to-noise density ratio and gain-to-noise temperature ratio are studied. Frequency modulation and multiphase modulation methods are investigated. The laboratory uses several software simulation tools to analyze the different segments of the satellite communication networks. The link budget analysis, launching phase analysis and others are performed to improve understanding of the theoretical concepts. Dish antenna, transmitter/receiver, waveguides and spectrum analyzer are utilized to enhance experiments.

Prerequisites: TCET 2220, TCET 3102

TCET 3242 Advanced Communication Network

2 cl hrs, 3 lab hrs, 3 cr

The primary objective of this course is to help students to master Local Area Networks (LANs) and Wide Area Networks (WANs). Subjects covered include IP addressing, routing, switching, network troubleshooting and network management skills to interconnect LANs and WANs.

Prerequisites: MAT 1575, TCET 3142

TCET 4000 Internship (for TCET-BT program)

2 cl hrs bi-wkly, 130 field hrs/ semester, 3 cr

Ten hours per week of assigned field/study work applying classroom principles and theory to real-world telecommunications technology problems. Interns work as technologists to assist engineers and network administrators design and build LAN/WAN networks, install hardware/software, perform online and offline testing and generate supporting documentation. Each student must maintain a log/journal to be shared in group seminars.

Prerequisites: Completion of all sixth semester courses with a GPA of 2.8 or higher and approval of the department internship director

TCET 4102 Fiber-Optic Communications

2 cl hrs, 3 lab hrs, 3 cr

Devoted to all aspects of fiber-optic communication technologies. Optical fibers, LEDs, laser diodes, photodiodes, passive components, optical amplifiers and all basic units of a fiber-optic communications system are discussed. Transmission aspects of fiber-optic networks are also studied. The laboratory familiarizes students with basic components, measuring and troubleshooting tools and techniques, for optical communications applications.

Prerequisite: TCET 3202

TCET 4110 Electromagnetics and Antenna Design

3 cl hrs, 3 cr

This course introduces the characteristics of electromagnetic waves and their behavior during the propagation through a space. Maxwell's equations, RF path loss, reflection, multi-path fading, noise, interference, polarization

distortion and other related topics are discussed. Different types of antennas, as well as antenna in a system and antenna measurements, are also discussed. Included in the course are software packages used in antenna design, along with examples using these packages.

Prerequisites: TCET 3222, MAT 1575

TCET 4120 Legal and Regulatory Issues in Telecommunications

2 cl hrs, 2 cr

Legal terminology and legal analysis skills necessary to understand state and federal regulations as they impact the rapidly expanding telecommunications industry are discussed. Legal issues raised by the deregulation of the telecommunications industry are studied. The role of the courts, legislature and administrative agencies are covered. Relevant policies that affect current and future telecommunication systems are explored.

Prerequisites: TCET 3142, TCET 3202

TCET 4132 Wireless Communications

2 cl hrs, 3 lab hrs, 3 cr

The course covers concepts of wireless systems. It discusses propagation effects including loss, dispersion, fading, transmission and reception; mobile systems including analysis and design principles of base and mobile units; micro cells and pico cells; cell division including frequency use and reuse; concepts of FDMA, TDMA and CDMA; error rates and outage probability. Computer simulations and hard-wired experiments dealing with RF spectrum, outdoor and indoor propagation, cellular concept, DSSS, IEEE 802.11 WLAN and CDMA are parts of laboratory exercises.

Prerequisites: MAT 1372 or MAT 1572, MAT 1575, TCET 3102

TCET 4140 Telecommunications Network Management

3 cl hrs, 3 cr

This course deals with the technical management of a telecommunication network, personnel tasks, staffing patterns suitable to diverse telecommunications firms and users, with an overview of the issues facing the network manager. Included are studies of cost and trade-offs involved in the design and operation of a telecommunications network.

Reliability, MTBF, RFP and MTTR life cycle are analyzed. Traffic patterns and the study of equipment/manpower balance considerations are covered.

Prerequisite: TCET 3142; *Pre- or corequisite:* ECON 1101

TCET 4152 Optical Network Components

2 cl hrs, 3 lab hrs, 3 cr

This course concentrates on components for optical networks such as multimode and single-mode optical fibers, transmitters, receivers, passive components and active components. The principal objective is teaching students to understand technical documentation through the prism of the scientific and engineering foundation of the discussed components. The course pays special attention to new trends, e.g., expansion of the components functionality by making use of tunable devices and the increase of the level of component integration. *Prerequisite:* TCET 3202; *Corequisite:* TCET 4162

TCET 4162 Photonic Devices

2 cl hrs, 3 lab hrs, 3 cr

This course provides a broad overview of photonic devices including the underlying principles and applications for communications. Planar waveguides, semiconductor photonic devices including light emitting diodes (LEDs) and laser diodes, devices for polarization and modulation, photodetectors and optical sensors are discussed. The course also considers system performance of photonic devices and their applications in practical modules. *Prerequisite:* TCET 3202

TCET 4172 Telecommunication Protocols and Network Performance

2 cl hrs, 3 lab hrs, 3 cr

Telecommunication protocols and network performance including high-speed networks and gigabit networks, form the focus of the course. As the level of traffic on the network grows, and congestion occurs, all packet delivery is slowed. Design issues related to two types of networks are considered: Internets based on the Internet Protocol (IP) and the entire TCP/IP protocol suite, and ATM (asynchronous transfer mode) networks. The course explores the design approaches shared by these two technologies. The course will cover

high-speed network performance modeling and estimation, effects of congestion, traffic management, link control mechanisms, ATM traffic-related attributes, integrated services architecture and telecommunication protocols for Quality of Service (QoS) support.

Prerequisites: MAT 1575, TCET 3142

TCET 4182 Telecommunications Capstone Project I

1 cl hr, 2 lab hrs, 2 cr

First part of a two-semester senior design course sequence that introduces programming of embedded systems, research and development methodology, project management, technical writing and presentation. Students present an introductory-level final project incorporating telecommunications engineering designs that are fully documented and prototyped.

Prerequisite: TCET 3202; *Pre- or corequisite:* CST 2403

TCET 4202 Advanced Telecommunications

2 cl hrs, 3 lab hrs, 3 cr

Discrete time signals are studied in time and frequency domains using Z transform. The properties of the DFT are studied as well as its applications. Linear convolution and circular convolution are presented. The FFT is covered. Up sampling, down sampling and up/down sampling are considered in both time and frequency domains as well as for filter requirements. Basic FIR and IIR discrete filters are studied. Software simulation is used to supplement the theory, augmented by Digital Signal Processing and its applications in telecommunications. *Prerequisites:* TCET 3222, TCET 4102

TCET 4210 Fundamentals of Microwave Remote Sensing

3 cl hrs, 3 cr

This course covers the concept and applications of microwave remote-sensing. Other topics covered are remote sensing platforms, data collection and analysis methods and types of microwave remote-sensing sensors. The combination of Geographic Information System (GIS) and microwave remote sensing provides even more valuable information about the target under study. Use of selected software packages developed for the analysis of remotely sensed data will also be included in this course.

Prerequisite: TCET 3222

TCET 4232 Optical Networks

2 cl hrs, 3 lab hrs, 3 cr

This course concentrates on optical networks. The topics include evolution and classification of optical networks; architecture, protocols and standards; switching and routing in optical networks including circuit switching and trends in packet and burst switching along with label switching; design issues in optical networks; management of optical networks including tests, measurements and monitoring. A special session is devoted to accessing optical networks. The main focus of this course is the current status and future trends in the developing optical networks, providing students with advanced career preparation.

Prerequisites: TCET 4152, TCET 4162

TCET 4282 Telecommunications Capstone Project II

1 cl hr, 2 lab hrs, 2 cr

The second part of a two-semester senior design course sequence that integrates telecommunications principles, problem solving skills and lab experiences students have gained throughout their undergraduate curriculum. Uses research and development methodology skills as well as troubleshooting, teamwork, project management, technical writing, and presentation. Students present a final project incorporating engineering designs that are fully documented and prototyped.

Prerequisite: TCET 4182

ETX 1212 Digital Systems for Telecommunications I

3 cl hrs, 2 lab hrs, 4 cr

This course introduces the topics in hardware and systems as used in the telecommunications industry. Digital and electrical circuits are explored. Binary numbers systems as applied to telecommunications equipment are discussed. Students will explore hardware to the modular level. Students will demonstrate and simulate digital circuits.

Prerequisites: MST 1101, MAT 1215

ETX 2112 Digital Systems for Telecommunications II

4 cl hrs, 4 cr

This course covers an introduction to the personal computer fundamentals with hardware and software installation. The course will cover managing and supporting Windows.

Configure user-related issues and customization. Learning how to troubleshoot, maintain a computer. Students will connect a personal computer to a network, and install and set up a printer. An optional topic would cover Home Technology Integration including surveillance, home automation, and cabling. The course is composed of lecture and in-class demonstration *Prerequisite:* ETX 1212

ETX 2222 Electrical Circuits

3 cl hrs, 2 lab hrs, 4 cr

This course analyzes DC and AC passive circuits using Ohm's Law, Kirchhoff's laws, Superposition. RC and RL circuits are analyzed for impedance and phase angles. Troubleshooting, analysis by computer simulation using simulation software, and telecommunication applications are stressed throughout.

Pre- or corequisite: PHYS 1420

ETX 3122 Electronics for Telecommunications

4 cl hrs, 4 cr

This course provides a basic understanding of telecommunications electronics. Topics include frequency response, filters, analog and digital modulation techniques, and transmission line concepts.

Prerequisites: ETX 1212, MAT 1315

ETX 3222 Electronic Systems II

4 cl hrs, 4 cr

The course is focused on analysis and application of advanced electronic circuits as applied to the telecommunications industry. Topics include frequency modulation, communication: techniques, digital, wired, and wireless, transmission lines, antennas, and fiber optics. Troubleshooting and analysis by computer simulation software is stressed throughout.

Prerequisite: ETX 3122

ETX 3142 Networking Fundamentals

4 cl hrs, 4 cr

Students learn to understand and use accurate network data linkage approaches, contemporary network connections services and the security requirements of the data network industry.

Prerequisite: ETX 2222

ETX 3242**Advanced Networking**

4 cl hrs, 4 cr

Students learn to understand and use switches and routers in simple and complex networks. Emphasis is provided on the use and operation of a wide range of Cisco products. Additional exposure is given to a range of traditional wide area network services which are used in today's network infrastructure.

Prerequisite: ETX 3142; Corequisite: TCET 2202

ETX 4142**Broadband Services**

3 cl hrs, 2 lab hrs, 4 cr

Students learn to understand and use a range of upper level services supported by TCP/IP protocols and broadband transmission services. Emphasis is given to the design and operation of Voice over IP and Video over IP applications.

Prerequisite: ETX 3242

ETX 4242**Telecommunications Seminar**

3 cl hrs, 2 lab hrs, 4 cr

Emerging technologies by their nature change over time. This course is designed to expose the student to the research and evaluation techniques needed understand a wide range of technologies and their future role in the telecommunications industry. Emerging technologies are the platform upon which this capstone course experience is to be built. Central to the experience is the student's ability to demonstrate the capacity for lifelong learning by researching emerging technologies, trends, and issues in a way that integrates and builds upon prior learning. It is intended that this be a student centered course where the faculty member sets standards for the course and serves as a guide, resource, and monitor to help keep students on track. Research papers, whitepapers, hands-on projects, alone or in any combination are among the approaches that faculty may use to inspire and evaluate student performance.

Prerequisite: ETX 4142

Entertainment Technology

Charles Scott, Chair
Voorhees Hall, room V 203
718.260.5588
email: entertainmenttechnology@citytech.cuny.edu

PROGRAMS:

Emerging Media Technology/BTech (MTEC)
Entertainment Technology/BTech (STB)

FACULTY:

Professors: Huntington, Scott
Associate Professor: Brandt, McCullough, Terao
Assistant Professors: Boisvert, Wilson

Senior CLT: Robinson
CLT: Guerrero

Bachelor of Technology in ENTERTAINMENT TECHNOLOGY

The entertainment industry has grown tremendously in the last 30 years. As with film and theatre, the increasing prominence of the theme park, music concerts, malls and amusement, the use of immersive technologies in advertising and marketing, sporting events, and the expansion of cable and independent television has created an entirely new job market for technicians, managers and designers. City Tech's Entertainment Technology program, the only one of its kind in the Northeast, and one of the few in the world, is designed to address these changes and provide students with the specialized technical coursework that is required to work in a variety of professional environments.

The program seeks to provide highly competent graduates for careers as scenery, lighting, sound, video, and show systems technologists, technical and production managers, equipment marketing representatives and personnel for distributors and rental houses in the entertainment industry. The program offers additional career options in the allied fields of film and television production; display design and construction; trade show exhibitions; club, casino and theme-park operations and all related performing arts production. Students desiring careers as designers or content creators can also benefit from the integrated technical and production components, and the degree provides a compelling stepping stone to more advanced design work at the graduate level.

Admission to the Bachelor of Technology Program

There are many ways a student can enter the bachelor of technology program in Entertainment Technology. Students may enter from other City Tech programs or from other colleges if they meet the College criteria for transfer admission or have completed an associate degree with an articulation agreement. Transcripts of entering transfer students will be evaluated by the Registrar prior to registration. All students admitted to bachelor programs in The City University of New York are first required to meet standards of proficiency in reading, writing and mathematics, demonstrated by passing CUNY skills assessment tests, and/or other prescribed requirements as may be applicable. Students

who have not achieved proficiency in all three areas will be denied access to entertainment technology major, but will be allowed to take introductory courses while they work to meet the requirements.

The curriculum recognizes the need for specialized technical coursework as part of the necessary education for modern stage technicians and managers. The program allows applied science to enhance applied art, giving students a solid foundation of technical principles on which to build their careers.

Program Educational Objectives

The objectives of the Entertainment Technology Bachelor of Technology program are:

1. Prepare students to work in the entertainment industry by giving them hands-on practice with state of the art tools and equipment.
2. Give students opportunities to work alongside and learn from industry professionals
3. Impart a sense of professional ethics, including an appreciation of collaborative work, commitment to lifelong learning, and dedication to personal responsibility

Program Learning Outcomes

After completing the Entertainment Technology degree, students will:

1. Be effective collaborators, with the ability to work as a member of a team and communicate with written, graphic, and oral means.
2. Be proficient in lighting, sound, scenic, show systems, and video technology.
3. Attain mastery in two areas of study.
4. Be effective managers, with an understanding of production planning and budget estimation.

Approximate additional costs other than tuition, student fees, and material fees will range from \$1,900 to \$2,950 for textbooks, supplies, memberships, trade show admissions, periodicals, clothing, safety equipment, and tools while attending the program. Additionally, a recent model laptop computer suitable for CAD software is highly recommended.

Students benefit from studying in small classes under the guidance of professional, industry-oriented faculty and learning in industry-standard facilities. New York City is an added resource to further enhance the dynamic and diversified course offerings. Student clubs are an important part of the study in the program and include:

City Tech Theatreworks:

Each semester, students participate in one or more productions or workshops led by industry professionals.

The Stagecraft Club:

Members attend guest lectures by industry specialists, manufacturer product demonstrations, and field trips to local shops and theatres.

The Society of Motion Picture and Television Engineers Student Chapter:

This national group provides students with the opportunity to meet industry leaders and professionals, and to interact outside of the classroom with other students and faculty who have an interest in the motion imaging industry.

Entertainment Technology alumni can be found in the professional live performance venues, in design, installation and manufacturing shops, in television and video/film concert venues, as well as working with many entertainment-related companies in their respective communities. Student technicians receive valuable training by participating in the lighting, sound, video, show systems, production, publicity, and scenery crews for performances each year. For further information, call 718.260.5588 at the Entertainment Technology office in Voorhees Hall.

GENERAL EDUCATION COMMON CORE		CREDITS
I – REQUIRED CORE (4 COURSES, 12 CREDITS)		
English Composition (2 courses, 6 credits)		
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
Mathematical and Quantitative Reasoning (1 course, 3 credits)		
	Any approved course	3
Life and Physical Sciences (1 course, 3 credits)		
	Any approved course (Physics recommended)	3
II – FLEXIBLE CORE (6 COURSES, 18 CREDITS)		
Select one course from each of the following areas, plus one additional course from any of the five areas		18
World Cultures and Global Issues		
Any Approved Course		
US Experience in its Diversity		
Any Approved Course		
Individual and Society		
Any Approved Course		
Creative Expression		
Any Approved Course		
Scientific World		
Any Approved Course		
III – COLLEGE OPTION REQUIREMENTS (4 COURSES, 12 CREDITS)		
• One course in Speech/Oral Communication		
COM 1330	Public Speaking or higher	3
• One interdisciplinary Liberal Arts and Sciences course		
Any Approved Course		3
• Additional liberal arts credits to reach a total of 42 credits in general education (any two approved courses, one must be advanced).		
	Liberal Arts Elective	3
	Liberal Arts Advanced Elective	3
Writing Intensive Requirement		
Students at New York City College of Technology must complete four courses designated WI for the baccalaureate degree, two from GenEd and two from the major.		
PROGRAM-SPECIFIC DEGREE REQUIREMENTS		78 CREDITS
ENT 1100	Introduction to Entertainment Technology (WI)	3
CST 1101	Problem Solving with Computer Programming	3
ENT 1102	Health and Safety in Production	1
ENT 1106	Technical Production Skills	1
ENT 1108	Entertainment Drafting I	3
ENT 1110	Scenery Construction	3
ENT 1190	Video Technology	3
ENT 1201	Basic Electricity for Live Entertainment	1

ENT 1203	Basic Electricity for Live Entertainment Lab	1
ENT 1250	Lighting Technology	3
ENT 1270	Sound Technology I	3
ENT 2200	Entertainment Drafting II	3
ENT 2280	Entertainment Control Systems	3
ENT 3320	Technical Production (2 cr; must take 3 times)	6
ENT 4430	Project Management (WI)	3
ENT 4498	Career Seminar	1
ENT 4499	Culmination Project	2
ENT 4900	Internship in Entertainment Technology	3
ENT MAJOR MODULES		
Select two of the following modules for 18 credits:		
VIDEO		
ENT 2290	Video Studio Operations	3
ENT 3190	Video Editing Skills	3
ENT 4390	Advanced Video Editing	3
SCENERY		
ENT 2210	Advanced Scenery Construction	3
ENT 3200	Introduction to Scene Design	*3
* and ENT 3400 Stage Rigging and Mechanics, if also in Lighting Module		
ENT 4410	Technical Direction	3
LIGHTING		
ENT 2350	Lighting Controls for Stage and Studio	3
ENT 3200	Introduction to Scene Design	*3
* and ENT 3400 Stage Rigging and Mechanics, if also in Scenery Module		
ENT 4450	Lighting Design	3
SOUND		
ENT 2370	Sound Technology II	3
ENT 3390	Sound for Multi-Media or ENT 4470 Sound Design	3
ENT 4475	Sound Systems	3
SHOW SYSTEMS		
MTEC 2260 or ENT 3310 or ENT 3330 or ENT 3350		3
MTEC 2280	Ins and Outs	3
ENT 4480	Show Systems Integration	3
Subtotal		18
ELECTIVE COURSES		
Select 14 credits, including at least 6 credits in courses from the Entertainment Technology Department (any ENT or MTEC courses not required in the chosen two modules above)Additional Entertainment Technology electives not listed above:		
(Courses listed in the Major Modules may be used as electives)		
MTEC	Any courses	
ENT 2140	Basic Welding	2
ENT 3290	Digital Video Camera	3
ENT 3300	Advanced Scenery Drafting	3
ENT 3310	Monster Shop	2
ENT 3320	Technical Production (4th, 5th, and 6th time class repeated above major requirement)	2-6
ENT 3330	Entertainment Video Systems	3

ENT 3400	Stage Rigging and Mechanics	3
ENT 3430	Stage Management	3
ENT 4500	Special Topics in Entertainment Technology (may be taken two times with different topics)	3-6
ENT 4901	Internship in Entertainment Technology II	3
IS 9010	Independent Study	1-3

For the remaining credits, also allow selection from the following:

ENT BTech Electives

COMD	Any courses (Not COMD 2320 if ENT 1190 taken)	
AFR 1321	Black Theatre	3
BUS 1122	Business Law	3
BUS 2339	Financial Management	3
MKT 1100	Essentials of Marketing	3
MKT 1102	Principles of Selling	3
CST 1201	Programming Fundamentals	3
CST 1204	Database Systems Fundamentals	3
CST 2301	Multimedia and Mobile Device Programming	3
CST 2403	Introductory C++ Programming Language Part I	3
CST 3503	C++ Programming Part II	3
ENG 2400	Films from Literature	3
ARTH	Any courses	
MUS	Any courses	
THE	Any Courses	
PERF 1132	Music Workshop Guitar	2
IND 2313	Industrial Design I	2
MECH 1101	Manufacturing Process Laboratory	1
MECH 1201	Computer-Aided Manufacturing Systems	3
MECH 1233	Statics and Strength of Materials	3
MAT 1375 or higher (not used in Gen Educ. Common Core)		3-4

TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES **78**

TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS **42**

TOTAL CREDITS REQUIRED FOR THE DEGREE **120**

Bachelor of Technology in EMERGING MEDIA TECHNOLOGY

The BTech in Emerging Media Technologies is a four-year undergraduate program within the department of Entertainment Technology focused on creating the next generation of creative technologists for the expanding emerging media industries of New York City and beyond. Students develop solid skills within the framework of an integrated technical production-based curriculum. This uniquely qualifies them to work within the agile interdisciplinary teams that define today's media industry environment.

The program is one of a kind in its approach integrating media design theory and practice, computing media models and principles, and engineering methodology and implementation. In collaborative learning workshops, students gain hands-on experience using media production tools, develop skills in rapid prototyping, system integration, teamwork, software knowledge, and the tools to evaluate the viability of new media technologies. Advanced students create new media tools and software. The goal is to cultivate creative thinking capable of anticipating future applications of media technologies.

Students will complete the program with a technical production portfolio in their concentration area, a basic understanding of each of the concentration areas, and skills in production management, collaborative production (teamwork), and cooperative project design (collaborative design). Students will also learn general media and production technology including computer aided drafting and design software, simulation software, 3D modeling software, and digital media production competencies in audio, video, and web-based media. All students master basic competencies in interaction design.

For details see <http://www.citytech.cuny.edu/entertainment/>

Program Educational Objectives

The objectives of the Emerging Media Technology Bachelor of Technology program are to:

1. Prepare students to work in the emerging media industry by giving them hands-on practice with state of the art tools, methodologies, and production approaches.
2. Give students opportunities to work alongside and learn from industry professionals through service learning opportunities and internships at creative studios and tech start-ups.
3. Impart a sense of professional ethics, including collaborative work practices, a commitment to lifelong learning, and a dedication to societal impact.
4. Communicate the interdependence of creativity, design thinking, and the technological development processes.

Program Learning Outcomes

After completing the Emerging Media Technology Bachelor of Technology students will:

1. Attain mastery of one area of concentration of the major: Design, Computation, or Physical Computing.
2. Students will complete the program with a technical production portfolio in their concentration area.
3. Students will attain proficiency in multiple computational, design, and media technologies.
4. Students will attain proficiency in cooperative design and collaborative production.
5. Students will attain proficiency in production management.

Approximate additional costs other than tuition, student fees, and material fees will range from \$1,900 to \$2,950 for textbooks, supplies, memberships, and tools while attending the program. Additionally, a recent model MacBook laptop computer suitable for coding software is highly recommended.

CONCENTRATIONS/CAREER TRACKS

Choose one of the three concentrations from:

1. GAME DESIGN AND INTERACTIVE MEDIA

The Game Design and Interactive Media concentration provides students with foundational skills in game design and development, as well as current interactive and immersive media platforms to prepare them for careers as game designers, VR/AR designers, web/mobile app designers, UX, UI and experience designers, and multi-media programmers.

2. PHYSICAL COMPUTING

The Physical Computing concentration provides students with foundational skills in fabrication, circuit design for sound and entertainment and interface design to prepare students for careers such as 3D printing/CNC milling fabrication specialists, embedded system designers, custom sound and media device creation, and video game interface developers.

3. MEDIA COMPUTATION

The Media Computation concentration covers the tools and techniques of software development for interactive new media, including responsive applications for mobile and web, video games, and real-time audio and video systems.

4. MUSIC TECHNOLOGY

The Music Technology concentration provides students with skills in the development of musical interfaces and applications. Students learn systems for real-time signal processing and audio scheduling. Instruction targets installations, live performance, video games, and the web, as well as contemporary music production systems and sound design for games.

Note: GenEd requirements are specific to each concentration.

GENERAL EDUCATION COMMON CORE		42-48 CREDITS ¹
I – REQUIRED CORE		
English Composition (2 courses, 6 credits)		
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
Science and Math Required for Game Design and Interactive Media		
MAT	Any approved course	3
PHYS 1000	The Physical Universe or higher	3
Science and Math Required for Media Computation		
MAT 1275	College Algebra and Trigonometry or higher	4
PHYS 1433	General Physics I: Algebra Based	or 4-5
PHYS 1441	General Physics I: Calculus Based	
Science and Math Required for Physical Computing		
MAT 1275	College Algebra and Trigonometry or higher	4
PHYS 1441	General Physics I: Calculus Based	5
Science and Math Required for Music Technology		
MAT	Any Approved Course	3
PHYS 1000	The Physical Universe or higher	3

II – FLEXIBLE CORE

Select Any Approved

World Cultures and Global Issues	3	
US Experience in its Diversity	3	
Individual and Society	3	
Creative Expression	3	
Scientific World	3-5	
(2) Tangible Media Concentration students must take		
PHYS 1442	General Physics II: Calculus Based	5
(3) Media Computation Concentration students must take		
MAT 2440	Discrete Structures and Algorithms I	3
One additional course from any group	3	

III – COLLEGE OPTION REQUIREMENTS (12 CREDITS)

• One course in Speech/Communication		
COM 1330	Public Speaking or higher	3
• One interdisciplinary Liberal Arts and Sciences course		
Any Approved Course		3
• Additional liberal arts credits to reach a minimum of 42 credits in general education.		
In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language.		
Any Approved Course		3-4
(2) Tangible Media Concentration students must take		
MAT 1575		4
Any Approved Course		3

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

Subtotal 42-48

THESE COURSES ARE REQUIRED FOR ALL THREE CONCENTRATIONS

PROGRAM-SPECIFIC DEGREE REQUIREMENTS:

CREATIVE MEDIA FOUNDATIONS (13 COURSES, 33 CREDITS)

MTEC 1001	Game Design and Interactive Media Skills Lab	1
MTEC 1003	Media Computation Skills Lab	1
MTEC 1005	Physical Computing Skills Lab	1
MTEC 1101	Emerging Media Foundation	3
MTEC 1102	Production Practices	3
MTEC 2210	Game Design and Interactive Media	3
MTEC 2230	Media Computation	3
MTEC 2120	Interactive Media Systems Design	3
MTEC 2250	Fabrication for Physical Computing	3
MTEC 2280	Ins and Outs	3
CST 1101	Problem Solving with Computer Programming	3
CST 1201	Programming Fundamentals	3

ADVANCED COURSES (7 COURSES, 21 CREDITS)

MTEC 3140	Topics and Perspectives in Emerging Technologies	3
ENT 3320	Technical Production (must be taken 3 times)	6
ENT 4430	Project Management	3
ENT 4498	Career Skills	1
ENT 4499	Culmination Project	2
ENT 4900	Internship (135 Field Hours)	3
MTEC 4800	Interdisciplinary Team Project	3

1. GAME DESIGN AND INTERACTIVE MEDIA CONCENTRATION**REQUIRED COURSES 13-15**

PHYS 1000	The Physical Universe or higher	Met as GenEd
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Select five (5) courses from the following list:

COMD 3508	Introduction to Game Design Concepts	3
COMD 3540	2-Dimensional Animation	2
COMD 3640	3-Dimensional Animation and Modeling I	3
COMD 3740	3-Dimensional Animation and Modeling II	3
COMD 4720	Multimedia Design I	3
ARCH 3550	Building Performance Workshop	3
ARCH 3551	Sustainability: History and Practice	3
ENT 1190	Video Technology	3
ENT 1250	Lighting Technology	3
ENT 1270	Sound Technology I	3
ENT 3390	Sound for Multimedia	3
IND 2313	Industrial Design I	2
MTEC 2210	Game Design and Interactive Media	3
MTEC 3125	Nonlinear Narrative	3
MTEC 3160	Performance Design	3
MTEC 3175	Experimental Game Design and Development	3
MTEC 3230	Mixed Reality for Immersive Worlds	3
MTEC 3240	Data Sonification and Visualization	3

Other Degree-Specific Elective Courses 9-11

Select sufficient additional credits from the recommended degree electives list to equal 24 credits in the concentration

2. PHYSICAL COMPUTING CONCENTRATION**REQUIRED COURSES 9-17**

MAT 1475	Calculus ² or Higher	Met as GenEd
PHYS 1441	General Physics I: Calculus Based	Met as GenEd
PHYS 1442	General Physics II: Calculus Based	Met as GenEd
MAT 1575	Calculus II	Met as GenEd

Select four (4) courses from the following list:

MTEC 3280	Embedded Systems for Physical Computing	3
ENT 1108	Entertainment Drafting I	2
IND 1112	Engineering Drawing I	2
MECH 1222	Computer-Aided Engineering Graphics	2
MECH 1233	Statics and Strength of Materials	3
IND 2304	Advanced Solids Modeling	2
ETN 1102	Principles of Electricity and Electronics	4
ETN 1302	Principles of Electricity, Electronics and Computer Operation	4

EMT 1150	Electrical Circuits	5
EMT 1250	Fundamentals of Digital Systems	4
ENT 2280	Entertainment Control Systems	3
ENT 4480	Show Systems Integration	3
MAT 2580	Introduction to Linear Algebra	3
CST 2403	Introductory C++ Programming Language Part I	3
CET 3510	Microcomputer Systems Technology	4
CET 3640	Software for Computer Control	3
CET 4952	Robotics Technology	4

Other Degree-Specific Elective Courses 7-15

Select sufficient additional credits from the recommended degree electives list to equal 24 credits in the concentration. These may include up to 6 credits of the General Education Common Core math and science courses required for this concentration.

3. MEDIA COMPUTATION CONCENTRATION**REQUIRED COURSES 15-16**

MAT 1375	Precalculus ² or higher	Met as Gen Ed
PHYS 1433	General Physics I: Algebra Based or	
PHYS 1441	General Physics I: Calculus Based	Met as Gen Ed
MAT 2440	Discrete Structures and Algorithms I	Met as Gen Ed

Select five (5) courses from the following list:

CST 1204	Database System Fundamentals	3
CST 1215	Operating Systems Fundamentals	3
CST 2301	Multimedia and Mobile Device Programming	3
CST 2309	Web Programming I	3
CST 2403	Introductory C++ Programming Language Part	3
MTEC 3125	Nonlinear Narrative	3
MTEC 3175	Experimental Game Design and Development	3
MTEC 3230	Mixed Reality for Immersive Worlds	3
MTEC 3240	Data Sonification and Visualization	3
MTEC 4030	Computational Creativity	3
MAT 1475	Calculus I	4
MECH 3550	Simulation and Visualization	3
COMD 3508	Introduction to Game Design Concepts	3

Other Degree-Specific Elective Courses 8-9

Select sufficient additional credits from the recommended degree electives list to equal 24 credits in the concentration. These may include up to 6 credits of the General Education Common Core math and science courses required for this concentration.

4. MUSIC TECHNOLOGY CONCENTRATION**REQUIRED COURSES 15**

PHYS 1000	The Physical Universe or higher	Met as GenEd
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Take these five courses:

ENT 1270	Sound I	3
ENT 2370	Sound II	3
MTEC 2240	Music Technology	3
MTEC 2260	Music Synthesis and Sampling	3
ENT 4470	Sound Design	3

Other Degree-Specific Elective Courses

Select sufficient additional credits from the recommended degree electives list to equal 24 credits in the concentration

DEGREE ELECTIVES

Select from the following list, or any concentration-specific course, or any MTEC or ENT course that is not already required for your degree.

COMD 3640	3-Dimensional Animation and Modeling I	3
COMD 3740	3-Dimensional Animation and Modeling II	3
CET 3510	Microcomputer Systems Technology	4
CET 4960	Applied Digital Technology	4
CST 2307	Networking Fundamentals	3
CST 2409	Web Programming II	3
CST 2410	Introduction to Computer Security	3
CST 2415	System Administration (UNIX/Linux)	3
CST 3503	C++ Programming Part II	3

CST 3519	Advanced Web Client Technologies	3
IND 2401	Furniture Design	2
MECH 2322	Engineering Materials	3

Common core distribution credits in excess of 42 credits used to satisfy degree requirements up to 6 credits

COMMON CORE AND COLLEGE OPTION	42
PROGRAM-SPECIFIC DEGREE REQUIREMENTS	54
CONCENTRATION	24
REQUIRED FOR THE DEGREE	120

1 Surplus Common Core distribution credits (over 42) are applied to career concentration elective credits.

2 Students without the requisite math background will be required to take MAT 1175 in preparation. This will increase the number of credits required for the degree by 4-8 credits.

COURSES:

ENT 1100

Introduction to Entertainment Technology

3 cl hrs, 3 cr

An introduction to the entertainment technology industry including working methods; processes, equipment and facilities for live, recorded, and interactive entertainment and media environments, including theatre, opera, dance, concert productions, theme parks, themed-retail, cruise ship venues, video production, immersive, interactive and virtual environments, and gaming technology. Students will investigate commercial, not for profit, independent, and corporate industry models. Related current events and career opportunities will be discussed. Attendance at several of the type of events listed above is required.

Prerequisite: None

ENT 1102

Health and Safety in Production

1 cl hr, 1 cr

A survey of hazards specifically associated with working in theaters and fabrication shops. Topics include chemicals in pigments and polymer plastics; vapors, fumes and ventilation; shop conditions; proper preparation and planning; current OSHA and EPA standards; hazards associated with welding; firearm safety; fire codes. Course is to be taken in the first year as an entertainment technology major.

Prerequisite: None

ENT 1106

Technical Production Skills

45 lab hrs, 1 cr

Supervised laboratory in the technical areas of production. Hands-on experience in the planning, construction, rigging and running of productions to learn backstage procedures and operations in a performance situation.

Pre- or corequisite: ENT 1100

ENT 1108

Entertainment Drafting I

2 cl hrs, 2 lab hrs, 3 cr

An introduction to drafting standards and styles for the entertainment industry. Topics included are ground plans, sections, elevations, and construction drawings in two industry-standard CAD applications.

Pre- or corequisites: ENT 1100 and CUNY proficiency in mathematics

ENT 1110

Scenery Construction

2 cl hrs, 2 lab hrs, 3 cr

A survey of scenery, display and exhibit construction methods involving materials, equipment, counterweight rigging and performance/exhibit spaces. Introduces the use of shop tools and safety procedures, scenery flat construction, stairs, soft goods and platform units. Students will read working drawings and prepare projects by working in teams. Basic repair and maintenance procedures for equipment and spaces as used in the scenery process will also be investigated.

Prerequisite: ENT 1100; Pre- or corequisite: ENT 1102

ENT 1190

Video Technology

2 cl hrs, 2 lab hrs, 3 cr

An introduction to the basic components and practices of pre-production and production methodologies for content creation in video production. Through lectures, reading assignments, screenings and practice, students cover the basics of all stages of production inclusive of the processes of forming and working in production management teams, creating effective production aesthetics in pre-production and production stages, and storyboarding, camerawork aesthetics (basic lighting and camera), and editing according to the storyline, design and graphics functions. This is a survey course, in which students perform and demonstrate the different stages of video production to produce short videos.

Prerequisite: ENT 1100; Pre- or corequisite: ENT 1201

ENT 1201

Basic Electricity for Live Entertainment

1 cl hr, 1 cr

An introduction to and overview of the use of electricity in live entertainment. Voltage, current, power and resistance are introduced, and power and Watts' laws are covered, using practical examples from the entertainment field. Power generation and distribution, three-phase power and the National Electric Code sections pertaining to live entertainment are covered. Specific applications for lighting, sound, video, scenic automation will be used throughout the class.

Prerequisite: ENT 1100

ENT 1203

Basic Electricity for Live Entertainment Lab

0 cl hrs, 2 lab hrs, 1 cr

Hands on lab reinforcing and extending the entertainment-related electrical concepts covered in ENT 1201, Basic Electricity for Live Entertainment. Students will gain hands-on experience with live entertainment electrical technologies, learn to use basic measurement tools and test equipment, while extending their understanding of the electrical concepts introduced in ENT 1201. Specific labs will be drawn from entertainment fields of lighting, sound, video, and scenic automation.

Pre- or corequisite: ENT 1201

ENT 1250

Lighting Technology

2 cl hrs, 2 lab hrs, 3 cr

Introduction to stage lighting equipment and its mechanical, optical and electronic design. Hanging, alignment, focusing, maintenance and operation of various types of stage lighting fixtures. Field visits to New York rental shops or manufacturing facilities. Introduction to operation of automated fixtures and peripheral devices.

Prerequisite: ENT 1100; Pre- or corequisite: ENT 1106, ENT 1108, ENT 1203

ENT 1270

Sound Technology I

2 cl hrs, 2 lab hrs, 3 cr

An introduction to the use of sound in entertainment, its natural properties and physical components. Topics include microphones, recording equipment, control consoles, reproduction techniques,

amplification, distribution, loudspeaker systems, frequency response, decibels and dynamic range. Live and recorded sound techniques and the assembly of small audio systems from diagrams.

Prerequisite: ENT 1100; *Pre- or corequisite:* ENT 1203

ENT 2140

Basic Welding

1 cl hr, 2 lab hrs, 2 cr

Study of welding techniques including MIG and electric arc welding, use of circuit and current controls, protective devices and care of equipment and accessories. Metallurgical considerations, electrode and base metal, electrode classifications and welding symbols. Carbon arc welding, oxy-acetylene cutting, MIG, physical testing and analysis of weld specimen are included.

(offered in the fall semester)

Prerequisite: ENT 1110

ENT 2200

Entertainment Drafting II

2 cl hrs, 2 lab hrs, 3 cr

Graphic standards for the entertainment industry including the drafting and interpretation of ground plans, sections, sight line studies, working drawings of individual scenery elements and light plots. Hand drafting, computer-aided drafting programs and related techniques are covered and used.

Prerequisite: ENT 1108; *Pre- or corequisite:* ENT 1110 or ENT 1250

ENT 2210

Advanced Scenery Construction

2 cl hrs, 2 lab hrs, 3 cr

Advanced methods of scenery, display and exhibit construction, with an emphasis on technical problem-solving and research in the use of materials and techniques. Technical drafting of working drawings and the combining of complex scenery elements are examined. Methods of scene shifting and motion control are introduced. (offered in the fall semester)

Prerequisites: ENT 1110, ENT 1108; *Pre- or corequisite:* ENT 2200

ENT 2280

Entertainment Control Systems

2 cl hrs, 2 lab hrs, 3 cr

An introduction to the basics of entertainment control systems that underlie systems in sound, lighting, machinery, video, projection, pyrotechnics and other entertainment disciplines. The course starts with basic control concepts and data communications. Once the groundwork is laid, control protocols specific to lighting, sound and

machinery will be covered. The course also introduces students to Ethernet and show control protocols.

Prerequisites: ENT 1250 and ENT 1270

ENT 2300

Video Studio Operations

2 cl hrs, 2 lab hrs, 3 cr

An introduction to the basic components and practices of pre-production and production methodologies for content creation in video production. Through lectures, reading assignments, screenings and practice, students cover the basics of all stages of production inclusive of the processes of forming and working in production management teams, creating effective production aesthetics in pre-production and production stages, and storyboarding, camerawork aesthetics (basic lighting and camera), and editing according to the storyline, design and graphics functions. A survey course, in which students perform and demonstrate the different stages of video production to produce short videos.

Prerequisite: ENT 1250 and (ENT 1190 or COMD 2320)

ENT 2350

Lighting Controls for Stage and Studio

2 cl hrs, 2 lab hrs, 3 cr

An advanced study of lighting control systems, console programming and automated lighting control. Control-system architecture, set-up and communication protocols will be used to study advanced programming techniques. Automated fixtures, advanced dimming systems, color scrollers and traditional lighting fixtures will be studied in a fully functional moving light lab. Students will receive individual instruction using computer emulation, WYSIWYG simulation and hands-on programming sessions on a variety of consoles.

Prerequisite: ENT 1250

ENT 2370

Sound Technology II

2 cl hrs, 2 lab hrs, 3 cr

Students capture sound through the use of various types of microphones, and route signals using analog and digital techniques. Tying all this together, students mix sounds using a variety of tools, both software and hardware based, and begin to address the aesthetics of the mix.

(Formerly titled Sound Engineering)

Prerequisite: ENT 1270

ENT 3190

Video Editing Skills

2 cl hr, 2 lab hrs, 3 cr

An intermediate course on industry-standard editing and motion graphics software. Students explore the practical features of the software and practice the essentials of effective editing and the principle elements of motion graphics. Short subject projects are edited. This course prepares students for ENT 4390 Advanced Video Editing.

Prerequisite: ENT 1190

ENT 3200

Introduction to Scene Design

2 cl hrs, 2 lab hrs, 3 cr

A design course taught from the point of view of the scenic aspects of a collaborative project, with a focus on the tools used by the designer to communicate with the entire team of designers, engineers, technical staff and performers. Students will study the vast resources and mediums that are part of the creative process and learn how scenery, lighting, costumes, props, paint and graphics are integrated into a performance project.

Prerequisites: ENG 1101, ENT 1108; *Pre- or corequisite:* ENT 1110 or ENT 1250 or ENT 2290 or MTEC 1101

ENT 3290

Digital Video Camera

1 cl hr, 4 lab hrs, 3 cr

An intermediate level course in the effective use of camera and lighting in video production. Students will expand on the concepts learned in ENT 2290 to become more effective camera operators and cinematographers. Class projects will provide practice in the integration of aesthetics, content, and technology. Topics covered include lens selection, lighting techniques, image manipulation, camerawork, and composition. Moving images from the past and present will be examined and analyzed. Concepts will be reinforced through production work in the studio and in the field.

Prerequisite: ENT 2290 or department approval

ENT 3300

Advanced Scenery Drafting

1 cl hr, 3 lab hrs, 2 cr

A continuation of ENT 2200 covering CAD drafting and interpretation of stage plans, 3D modeling and working drawings of complex three-dimensional scenery elements. Light plots, section views and sound plots will also be covered in depth. (offered in the fall semester)

Prerequisite: ENT 2200

ENT 3310

Monster Shop

1 cl hr, 3 lab hrs, 2 cr

Special uses of plastics and metals in the fabrication of stage scenery and scenery elements. The major emphasis will be placed on the forming and shaping of various plastics, molds and casting, problems of safety and toxicity and the selection and use of metals. (offered as needed)

Prerequisites: ENT 2140 AND ENT 2200. *(This course may be taken 2 times for a total of 4 credits)*

ENT 3320

Technical Production

90 lab hrs, 2 cr

Supervised laboratory in the technical areas of production. Hands-on experience in the planning, construction, rigging and running of productions to learn backstage procedures and operations in a performance situation. Emphasis placed on careful pre-planning, appropriate safety procedures and on follow-up critiques and evaluation of the work done. Assignments will be made on the basis of the ability and the prior achievements of each student, assuring a variety of work experiences. Each succeeding semester will involve a greater degree of production responsibility. ENT 3320 is required to be taken 3 times in the major for 6 credits. Course may be taken as an elective 3 additional times for 6 elective credits.

Prerequisites: ENT 1100 and ENT 1106* (*not a prerequisite if MTEC1102 has been taken.); *Pre- or corequisites:* ENT 1110 or ENT 1190 or ENT 1250 or ENT 1270 or MTEC 1102

Equivalent to old courses ENT 2220, ENT 3420, ENT 4421, and ENT 4422

ENT 3330

Entertainment Video Systems

2 cl hrs, 2 lab hrs, 3 cr

Provides a theoretical and practical foundation in temporary and permanent video-systems technology for entertainment applications such as theatre, corporate events, hotel/ballroom A/V work, theme parks, museums and other related applications. After an introduction to video signals and formats, the application and use of a wide variety of video equipment such as disc-based video playback devices, production switchers, scan converters, frame synchronizers and video projectors is explored. The second half of the class covers practical applications, designing and building video systems for live events, permanent installations, and evaluating the performance of these systems with the aid of test signals and video test equipment. (offered in the fall semester)

Prerequisite: ENT 1190 and ENT 2280 or department approval

**ENT 3350
Lighting Production Techniques**

2 cl hrs, 2 lab hrs, 3 cr

An advanced study of the applications of lighting technology in entertainment venues. An in depth study of film, video, stage and concert lighting production, with emphasis on production management techniques. Specific skills in drafting, lighting databases, electrical practice, shop preparation, rigging, grip equipment use, load-ins, focusing, color use, cueing and performance support. (offered every other year)

Prerequisites: ENT 2200, ENT 2350

**ENT 3390
Sound for Multimedia**

2 cl hrs, 2 lab hrs, 3 cr

Introduction to the use of sound in multimedia. Digital multitrack recording and editing is explored, with an emphasis on integration with visual components. Students develop techniques of recording and editing on industry-standard software and hardware systems. Digital audio formats, compression protocols, streaming audio, synchronization and integration with multimedia elements are covered. MIDI and basic sequencing as used in Internet-based playback systems. Importing and exporting audio protocols between a variety of applications. Students will work in an intensive, project-oriented environment using a variety of applications on the Macintosh platform. It is recommended that AD students bring existing multimedia projects of their own creation to explore how to enhance with additional audio effects.

Prerequisites: ENT 1270

**ENT 3400
Stage Rigging and Mechanics**

2 cl hrs, 2 lab hrs, 3 cr

The course familiarizes the student with the basic principles of stage and event rigging, the equipment in general use and the appropriate safety practices and procedures used in the industry. (offered in the fall semester)

Prerequisite: ENT 1110, ENT 3320

**ENT 3430
Stage Management**

3 cl hrs, 0 lab hrs, 3 cr

Explore the theory, practice and tools of stage management. Students will create organizational documents including a prompt book and production calendar; generate and adapt forms for record keeping; and gain hands on experience using computers and appropriate software in support of live productions. Students will examine management

and organizational methods to support performers, designers and technicians. (offered in the spring semester)

Prerequisite: ENT 3320

**ENT 4390
Advanced Video Editing**

1 cl hrs, 4 lab hrs, 3 cr

The role of the video/film editor for both motion picture and live entertainment. Students perform intermediate and advanced techniques using contemporary video editing software. Covers communicating and collaborating effectively with directors, producers and their clients. At the end of the course, students possess in-depth knowledge of the theory and practice of editing moving images.

Prerequisites: ENT 2290, ENT 3190

**ENT 4410
Technical Direction**

2 cl hrs, 2 lab hrs, 3 cr

An in-depth analysis of the planning, budgeting and construction processes used in the production of scenery. Students will apply their knowledge of construction and drafting techniques and process to generate shop drawings, develop budget estimates and plan construction schedules. Lab work will focus on creating prototypes, introducing new construction materials, and developing jigs and fixtures that increase productivity and accuracy in the scene shop. (offered in the spring semester)

Prerequisite: ENT 2210; *Pre- or corequisite:* ENT 3200

**ENT 4430
Project Management**

3 cl hrs, 3 cr

An introduction to the methods and problems of running a professional entertainment business and managing technical projects. Subjects include contracts, bidding, estimates, procurement, government regulations, wage/time studies, shop layouts, workflow, the assembly and staffing of a show for performance, budgeting, scheduling, problem-solving, special problems (language barriers, conflict resolution, etc.) and political/social issues that affect working relations.

Prerequisites: ENT 3320 and (ENT 2210 or ENT 2290 or ENT 2370 or ENT 2350 or MTEC 3140) or department approval

**ENT 4450
Lighting Design**

2 cl hrs, 2 lab hrs, 3 cr

To support the aesthetics of lighting as a visual art, students analyze theatre and film/video scripts for

lighting requirements and develop a workable design concept. Students then generate complete lighting paperwork common to the job of an assistant lighting designer. Requires use of CADD software and hardware in the lighting laboratory. Advanced lab work includes projected video images and lighting pre-visualization software. (offered in the fall semester)

Prerequisites: ENT 2200, ENT 2350, ENT 3200

**ENT 4470
Sound Design**

2 cl hrs, 2 lab hrs, 3 cr

An investigation of the techniques and practices of sound design, emphasizing the use of modern computer-based recording and playback techniques. Sampling, hard-disk playback systems, sequencing, MIDI, systems integration, the use of surround systems, low-frequency elements and specials to achieve a variety of effects will be covered. Sound design practices will include script analysis, sound cue construction, integration with director and communication with other members of the design team. Additional areas of concentration will include development of cues based on functional, transitional, underscoring, surreal and hyper-real techniques; integration of musical and soundscape aesthetics; practice on Macintosh computer platforms using Digital Performer, Pro-Tools and a variety of plug-ins; programming of automation equipment and development of robust redundant systems capable of sustaining a high-use theatrical environment. (offered as needed)

Pre- or corequisite: ENT 2370

**ENT 4475
Sound Systems**

2 cl hrs, 2 lab hrs, 3 cr

Extends beyond the foundation Sound Technology I and II classes into complex modern analog and networked digital audio systems, with a special focus on delivering sound to an audience through the use of loudspeakers. (offered in the spring semester)

Prerequisite: ENT 2370; *pre-or corequisite:* ENT 2230

**ENT 4480
Show Systems Integration**

2 cl hrs, 2 lab hrs, 3 cr

An investigation of the advanced techniques and practices of integrating and synchronizing entertainment control systems, a practice also known as show control. The course is made up of project-based work in computer-based systems integrating lighting, sound, machinery, video and other control systems for live performances, theme

parks, themed retail, museum exhibits and other hybrid entertainment forms. (offered in the spring semester)

Prerequisites: MTEC 2280, ENT 2280

**ENT 4498
Career Seminar**

1 lab hr, 1 cr

A seminar that prepares students to work with employers and clients. Sessions cover visual presentation techniques, graphics, interactive media presentations, design and technical documentation, interviewing, resumes, contracts, budgeting, unions, and collaboration skills. (offered as needed)

Corequisite: ENT 4499

**ENT 4499
Culmination Project**

1 cl hr, a minimum of 5 independent study hrs per wk, 2 cr

The senior thesis project, utilizing skills in an innovative way to develop a project that relates to the entertainment industry. Projects are developed through courses in the entertainment technology and/or emerging media technology programs. Projects require approval by the advisor and must demonstrate management, technical design and presentation skills. Documentation of planning, design and realization is presented to a committee of instructors, both in entertainment technology and related disciplines, as well as to industry professionals selected by the student and approved by the advisor. Though students enroll in this course during their senior year, development of the project should begin during the second semester of the junior year.

Prerequisites: 6 credits of ENT 3320 (3 courses), ENT 4430 and (ENT 4390 or ENT 4410 or ENT 4450 or ENT 4470 or ENT 4475 or ENT 4480 or MTEC 4800);

Corequisite: ENT 4498

**ENT 4500
Special Topics in Entertainment Technology**

3 cl hrs, 3 cr

Topics selected for each semester offered allow a more detailed exploration of one important aspect of study in entertainment technology from the areas of lighting, scenery, sound, video, management or control systems. An in-depth exploration of current and emerging trends. Topics differ each semester the course is offered and rotate among the areas as needed. Students research an advanced topic and present it in verbal and written form. (offered as needed)

Prerequisite: ENT2210 or higher (not ENT3320) or Departmental Permission (may be taken two times with different topics)

ENT 4900
Internship in Entertainment Technology

1 cl hr per wk, 120 internship hrs, 3 cr
For ENT Majors: work experience at a professional scenery fabrication shop, rental/supply house, Off-Broadway theater, or any related industry organization approved by the advisor. For MTEC Majors, work experience at a design firm, media electronics firm, media software firm, robotics firm, entertainment or media production firm, or any related industry organization approved by the advisor. This will serve to bridge the student's academic and commercial careers by giving the him/her professional work experience and industry contacts before the end of the senior year. Each student will keep a log/journal to be shared in group seminars. Supervision will be by faculty and a manager at the internship site.
Prerequisite: ENT 4390 or ENT 4410 or ENT 4450 or ENT 4470 or ENT 4475 or ENT 4480 or MTEC 4800

ENT 4901
Internship in Entertainment Technology II

1 cl hr per wk, 120 internship hrs, 3 cr
A second internship opportunity for Entertainment Technology majors. See course description for ENT 4900 above.
Prerequisite: ENT 4900

MTEC 1001
Game Design and Interactive Media Skills Lab

0 cl hrs, 3 lab hrs, 1 cr
A workshop based lab that offers supportive training in current tools used in emerging media design and content delivery. Topics covered include but are not limited to raster graphics, vector graphics, 3d modeling, digital audio, and digital video editing. The faculty supported, workshop environment encourages self-learning, which will help students stay relevant in the face of rapid technological change.
Pre- or corequisites: ENG 1101

MTEC 1003
Media Computation Skills Lab

0 cl hrs, 3 lab hrs, 1 cr
A workshop based lab that offers supportive training in current tools used in emerging media computation and version control. Topics covered include but are not limited to command line interfaces, shell scripting, distributed version control systems, and remote server administration. The faculty supported, workshop environment encourages self-learning, which will help students stay relevant in the face of rapid technological change.
Pre- or corequisites: ENG 1101
Equivalent to old course MTEC 1002

MTEC 1005
Tangible Media Skills Lab

0 cl hrs, 3 lab hrs, 1 cr
A workshop based lab that offers supportive training in current tools used in emerging media tangible product design and development. Topics covered include but are not limited to 3d printing, CNC milling, solid modeling and laser cutting. The faculty supported, workshop environment encourages self-learning, which will help students stay relevant in the face of rapid technological change.
Pre- or corequisites: ENG 1101

MTEC 1101
Emerging Media Foundation

2 cl hrs, 2 lab hrs, 3 cr
An introduction to interactive multimedia technology with a focus on interdisciplinary, project based, cooperative learning. Students will be immersed in the protocols and processes of the Interactive Media Technologies design process: idea development, presentation, prototyping and production, which will serve them in the face of rapid changes in technology. Students will explore basic theoretical and applied concepts of audio, visual, tactile and interaction design through creative group projects, visiting professionals and on-line documentation of their work.
Pre- or corequisites: MTEC 1001, ENT 1100
Equivalent to old course number IMT 1101

MTEC 1102
Production Practices

2 cl hrs, 2 lab hrs, 3 cr
A hands-on introduction to the best practices for production techniques used in games, interactive media and physical computing product development. Students acquire a deep understanding of content generation, technology pipeline and delivery systems for creating web, mobile, games, virtual & augmented reality, interactive installation and museum display, wearables and other hardware designs. Students learn the roles and responsibilities, build the skills for each role, as well as apply the design and development processes for each medium. An introduction to design thinking and rapid prototyping techniques, as well as the approval processes essential to bringing a product to market. The structure of this course emphasizes an integrated and multi-modal approach to game design, interactive media and physical computing with modeled instruction and practice in the technical aspects of production.
Prerequisite: MTEC 1101; Pre- or corequisite: MTEC 1003
Equivalent to old course number IMT 1102

MTEC 2120
Interactive Media Systems Design

2 cl hrs, 2 lab hrs, 3 cr
A nontraditional approach to the articulation of design techniques with different types of interactive media and an introduction to the theories, models and frameworks for designing interaction with sound and screen. Students sketch and prototype systems for the management and delivery of future media through multimedia visual programming languages.
Prerequisite: MTEC 1101; Pre- or corequisite: MTEC 1102, CST 1101

MTEC 2210
Game Design and Interactive Media

2 cl hrs, 2 lab hrs, 3 cr
A cross-disciplinary foundation for the design of games and interactive multimedia technology for artists, engineers, scientists and technologists. Students learn human-centered design principles and apply these methodologies to collaborative team-based projects across web interactive, mobile, games, virtual & augmented reality, biomedica and environmental installation. Using case studies, brainstorming processes and rapid analog and digital prototyping, students learn design thinking and problem solving techniques to enhance usability, incorporate sensory experience, influence perception, increase appeal and make more effective interactive design decisions, and make better design decisions.
Prerequisite: MTEC 1102
Corequisite: MTEC 2120

MTEC 2230
Media Computation

2 cl hrs, 2 lab hrs, 3 cr
Introduces a selection of programming languages, software tools, algorithms and data analysis techniques for engaging with new media as a software developer. Students are exposed to a diverse set of specific technologies, potentially including but not limited to: JavaScript, Bash, MySQL, C, Matlab/Octave, Rails, Max/PureData and Amazon Web Services.
Prerequisite: MTEC 1003, MTEC 1101, CST 1101

MTEC 2240
Music Technology

2 cl hrs, 2 lab hrs, 3 cr
An introduction and overview of the basic techniques and components used in commercial electronic music production. Students work at individual workstations with a variety of software. Rudiments of music theory are covered. Introduction to synthesis, sequencing, sampling and loop-based composition are covered. A brief history of music

technology, a detailed exploration of the MIDI specification and the techniques of configuring hardware and software systems for optimal effectiveness are also covered. (offered as needed)
Prerequisite: ENT 1270

MTEC 2250
Fabrication for Physical Computing

2 cl hrs, 2 lab hrs, 3 cr
A companion course to MTEC 2280, Ins and Outs, Fabrication for Physical Computing is a project-oriented course that focuses on digital fabrication techniques in emerging media practices. Students deepen their knowledge of 3D design tools for use in CNC, laser cutters, 3D printers and printed circuit boards. Students also explore and experiment with different materials available for the different fabrication machines.
Prerequisite: MTEC 1005, MTEC 1102; Pre- or corequisite: CST 1101
Equivalent to old course MTEC 1250

MTEC 2260
Music Synthesis and Sampling

2 cl hrs, 2 lab hrs, 3 cr
This hands-on course explores the principles of sound and note generation in music technology. Study begins with an investigation of the historical and theoretical backgrounds of synthesis, and then moves to programming in a variety of different synthesis engines. The second half of the course covers topics and principles of digital audio sampling as it applies to music technology. During the process, students will explore differences between sampling and synthesis techniques, and determine when to use them to best effect. The course will conclude with a presentation of work to the class and instructor. (offered as needed)
Prerequisite: ENT 1260

MTEC 2280
Ins and Outs

2 cl hrs, 2 lab hrs, 3 cr
An introduction to interactive technology with a focus on how we use technology to express ourselves and interact with our environment. This class combines a hands-on exploration of basic components of media, audio and control circuits. Students also develop interfacing technologies from simple switches to multidimensional sensors, integrated circuits and microcontrollers. Students use a scripting environment to program microcontrollers in order to process incoming data from sensors for control of media systems
Prerequisites: CST 1101, ENT 1203 or MTEC 1005; Pre- or corequisites: ENT 1250 or ENT 1260 or ENT 1270 or CST 1201

MTEC 3125**Nonlinear Narrative**

2 cl hrs, 2 lab hrs, 3 cr

Through the examination of the earliest gestures of cave drawings to sophisticated multimedia narratives, students study the ingredients and structures necessary for compelling storytelling. Through hands-on projects, students produce visual, auditory, written and integrated sequences using animation, video, sound, music, text, and dialog.

Prerequisites: ENG 1121, MTEC 2210; *Pre- or corequisite:* ENT 3320 or ENG 1710 or ENG 1773

MTEC 3140**Topics and Perspectives in Emerging Technologies**

2 cl hrs, 2 lab hrs, 3 cr

This course provides an introduction to the study and analysis of emerging technologies and how this influences practical process. Students will examine how technologies have evolved historically as well as develop perspectives on how they would best be used in the future. Major topics will include computing history, human-computer interaction, computers and culture, and the ethical and social implications of new technologies. In the lab component of the course, students will learn to employ methods of documentation currently in use at research institutions and in private industry in order to place research being done in a wider context. (Offered in the fall semester)

Prerequisite: MTEC 2210 and MTEC 2230; *for non MTEC majors:* ENG 1773 *Weird Science* or ENG 2420 *Science Fiction*. *Equivalent to old course ENT 3140*

MTEC 3160**Performance Design**

2 cl hrs, 2 lab hrs, 3 cr

Students learn to design live performance systems and time domain installations involving the composition of multiple media. Topics and projects focus on interactive technologies in live experience media venues.

Prerequisites: MTEC 2120 or MTEC 2250. *Equivalent to old course MTEC 2160*

MTEC 3175**Experimental Game Design and Development**

2 cl hrs, 2 lab hrs, 3 cr

This hands-on studio course focuses on the creation of innovative workable prototypes exploring expressive forms of gameplay using a variety of multimedia approaches, methodologies and materials. The aesthetics of game design, including asset and character

development, level design, game play experience and delivery systems is covered. Supplemental readings on the complex interplay between story and game is used to analyze effective narrative devices and game mechanics. The class covers game theory, design exercises and in-depth analysis of works across commercial, art & social change sectors.

Prerequisite: MTEC 2210; *Pre- or corequisite:* MTEC 2230. *Equivalent to old course MTEC 2175*

MTEC 3230**Mixed Reality for Immersive Worlds**

2 cl hrs, 2 lab hrs, 3 cr

An exploration of the new frontier of virtual, augmented and mixed reality across different market sectors. Students experiment with designing and developing game-based and interactive projects employing augmented reality (AR), virtual reality (VR), wearables, Internet-of-Things and machine learning for mobile, web and console environments. Students learn the fundamentals of Unity development, 3D modeling, stereoscopic perception and experiential design in the context of storytelling and content creation specific to these emerging forms. They work in small teams on collaborative projects with the latest head-mounted and sensor technology.

Prerequisite: MTEC 2210; *pre- or corequisite:* MTEC 2230

MTEC 3240**Data Sonification and Visualization**

2 cl hrs, 2 lab hrs, 3 cr

An introduction to data sonification and visualization for games, installations and scientific display. The technical skills and foundations covered apply to computer games, interactive music performance, multimedia art installations and environments for exploring multimedia scientific data. Students are exposed to audiovisual programming engines and sound computation basics. For final projects, students design and program an immersive environment, a game scene or an interactive simulation.

Prerequisites: ENT 1270, MTEC 2230

MTEC 3280**Embedded Systems for Physical Computing**

2 cl hrs, 2 lab hrs, 3 credits

A focus on the design and implementation of embedded systems with specific applications in emerging media including the following: audio media generation, storage and playback; sensor control of computational environments

in projection and animatronics; hardware control of interactive environments used in such applications as museum display and musical composition/performance. Common, low-cost, available components are used and students apply the knowledge learned in this class to a working final prototype for one of these specific areas.

Prerequisite: MTEC 2230, MTEC 2280

MTEC 4030**Computational Creativity**

2 cl hrs, 2 lab hrs, 3 cr

Introduction to artificial intelligence techniques for computational creativity. Topics covered include formal grammars, Markov chains, hidden Markov models, probabilistic automata, and artificial neural networks. Students use these techniques to analyze and generate digital art and music.

Prerequisite: MTEC 2230, MAT 2440

MTEC 4800**Interdisciplinary Team Project**

1 cl hrs, 4 lab hrs, 3 cr

An intermediate level course that provides practical experience in the conceptualization and production of collaborative, multi-disciplinary projects. Students learn how to apply the technology of their major in integration with other technologies. Advanced technologies are used to solve client needs and practical problems. The following laboratories are available in all program sequences: Experience Design Lab, Digital Media Lab, Computer Systems Lab, and Devices and Displays Lab. Open to students in COMD, CST, ENT, IND, MECH; open to others by permission of the program director. *Prerequisite:* Department approval; complete three of the required courses in selected media concentration.

Environmental Control Technology

Professor Robert Polchinski, Chair
Voorhees Building, room V 437
718.260.5160
email: rpolchinski@citytech.cuny.edu

PROGRAMS:

Environmental Control Technology/AAS
Facilities Management/BTech

FACULTY:

Assistant Professors: Kang, Polchinski, Sztaberek, Treglia
Lecturer: Cullen

CLT: Sadej

Associate in Applied Science in ENVIRONMENTAL CONTROL TECHNOLOGY

Environmental control technology is the study of the science, equipment and systems that are essential to creating and maintaining a comfortable indoor environment. Sophisticated air conditioning, heating and refrigeration systems are required to maintain the healthful indoor air quality that enables us to live and work in an urban setting, while conserving and utilizing energy resources wisely.

The environmental control technology curriculum contains the theory, design and practical laboratory courses that enable our graduates to secure substantial employment immediately upon graduation and to continue their professional growth. They can continue their education to the baccalaureate level in the facilities management degree with no loss of credit, or elect to study for mechanical engineering degrees elsewhere.

Graduates are able to pursue a wide variety of jobs in many different sectors of the economy. Among the many available careers are operating engineers, designers and CAD specialists, sales engineers, estimators and project managers. Commercial office buildings, large residential complexes, hospitals and health care agencies, museums, schools, consulting engineers and service contractors all seek graduates from this curriculum.

Employers of our graduates include Trane Air Conditioning, Barclays Center, Brooklyn Hospital, Methodist Hospital, Donnelly Mechanical, New York University, Jaros Baum & Bolles, Albert Weiss Air Conditioning, J.T. Falk Consulting Engineers, New York City Transit Authority and The Accardi Companies.

EC AAS Degree Learning Outcomes

Graduates learn the theory, design and practical aspects of environmental control technology to be able to:

- Design heating, air conditioning and ventilation systems.
- Efficiently operate and manage the environmental systems of large commercial, institutional, residential and similar facilities.
- Install, maintain and repair the full range of heating and air conditioning systems in use today and the evermore sophisticated systems planned for the future.

Other Degree Opportunities

Students who have successfully completed the requirements for the AAS degree are eligible for transfer into the bachelor of technology in Facilities Management program. [Click here](#) for a complete description. They may also continue their education toward a baccalaureate degree at other colleges. Transfer credit granted will depend upon each institution's requirements.

Alternate Format

Alternate format advanced placement is offered in environmental control technology. Please consult the department for eligibility requirements and further information.

GENERAL EDUCATION COMMON CORE¹

21-22 CREDITS

I – REQUIRED CORE (3 COURSES, 9-10 CREDITS)

English Composition (1 course, 3 credits)

ENG 1101	English Composition I	3
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Mathematical and Quantitative Reasoning (1 course, 3-4 credits)

MAT 1190	Quantitative Reasoning	3
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or

MAT 1275 ² or higher	College Algebra and Trigonometry	4
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Life and Physical Sciences (1 course, 3 credits)

Any Approved Course	3
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II – FLEXIBLE CORE (4 COURSES, 12 CREDITS)

Select one course from any four of the following five areas.	12
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World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Individual and Society

Any Approved Course

Creative Expression

Any Approved Course

Scientific World

Any Approved Course

Writing Intensive Requirement³

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS		39 CREDITS
ENVC 1110	Principles of Air Conditioning I	3
ENVC 1111	Air Conditioning Systems Laboratory I	1
ENVC 1120	HVAC Systems Graphics	2
ENVC 1210	Combustion Processes and Equipment	3
ENVC 1211	Heating Systems Laboratory	1
ENVC 1220	Hydronic Systems Design	3
ENVC 1250	Fire Protection, Plumbing and Electrical Systems for Buildings	3
ENVC 2311	Refrigeration Laboratory I	1
ENVC 2312	Principles of Refrigeration	3
ENVC 2321	Air Conditioning Systems Laboratory II	1
ENVC 2322	Principles of Air Conditioning II	3
ENVC 2340	Air Conditioning Systems Design	3
ENVC 2411	Refrigeration Laboratory II	1
ENVC 2420	Principles of HVAC Systems Controls	3
ENVC 2432	Advanced Air Conditioning Systems Design	3
MAT 1190	Quantitative Reasoning	or
MAT 1275 or higher	College Algebra and Trigonometry	Met as GenEd
Select one of the following seven courses (3 credits):		3
ENVC 2401	Renewable and Hybrid Energy Systems	
ENVC 2421	Air Conditioning Systems Laboratory III	
ENVC 2436	HVAC Systems Cost Estimating	
ENVC 2442	Principles of Environmental Protection	
ENVC 2452	Principles of Facility Energy Management	
ENVC 2462	Sustainability, Energy Processes and Equipment	
ENVC 2900	Internship	
Free Elective Credit		
As indicated or as required to reach 60 credits for AAS		2
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES		38-39
TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS		21-22
TOTAL CREDITS REQUIRED FOR THE DEGREE		60

¹ Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.

² Students without the requisite math background to enter MAT 1275 will be required to take MAT 1175 in preparation. This will increase the number of required credits for the degree by 4.

³ A semester-specific list of [writing intensive](#) courses is available online at the [City Tech Pathways website](#).

Bachelor of Technology in FACILITIES MANAGEMENT

Administered by the departments of Architectural Technology, Construction Management Technology, Environmental Control Technology, Law and Paralegal Studies

Professor Robert Polchinski, Program Director
Environmental Center, room E 206
718.260.5160
email: rpolchinski@citytech.cuny.edu

PROGRAMS:

Facilities Management/BTech

The Facilities Management baccalaureate degree prepares graduates for careers as facility managers in large commercial buildings, hospitals, residential complexes, universities and other institutions.

The program was designed as the upper level of associate degree programs in architectural, civil, construction and environmental control technologies. It adds the financial, legal, project management and additional technical courses that meet the demanding needs of the facilities management industry. This associate and baccalaureate degree format gives students an underlying expertise and a "can do" ability that is a hallmark of City Tech graduates. In addition, there are elective courses in facilities management that allow students to further develop their specialty in building engineering, construction management, or space planning.

In addition to this 2+2 program, there are two other tracks to the bachelor of technology degree in Facilities Management:

- City Tech students can elect a lower-level curriculum that includes several courses from each of the articulated associate degree programs.
- Students who already have an associate degree in other technical or business-related disciplines, from City Tech or other colleges, can enter the baccalaureate program after taking approximately 24 credits in one of our articulated AAS degrees. These additional courses are an integral part of the degree and an important part of future career skills. Liberal arts and science credits may be transferable, and courses from a student's previous major can enhance their capabilities and enable them to develop their own niche in facilities management. Consult Professor Robert Polchinski, the program director, to develop a customized list of these additional required courses prior to enrolling in the program or registering for classes.

Employment from entry-level to top management can be found throughout New York with over 900,000 properties and facilities. For those wishing to relocate to other areas, employment is available worldwide and is not dictated by market forces and outsourcing trends.

FM BT Degree Learning Outcomes

Graduates learn the technical, financial and managerial skills to prepare for careers as facility managers in the following specialty areas:

- Building Engineering.
- Construction Management.
- Space Planning and Programming.

Lower-Division Course Requirements

AAS degree in Construction Management Technology (FMC)

AAS degree in Environmental Control Technology (FME)

AAS degree in Architectural Technology (FMA)

AAS degree in Civil Engineering Technology (FMV)

60 credits of lower-division courses (FMB)

Upper-Division Course Requirements

The upper division of the Facilities Management bachelor of technology curriculum is given below. The statement of requirements varies depending on the associate-level degree granted (architectural technology, civil engineering technology, construction management technology, environmental control technology, or equivalent technical or business-related degree). Consult Professor Robert Polchinski, the program director.

Graduate Degree Opportunities

Graduates can secure meaningful and financially rewarding employment after obtaining their bachelor of technology in Facilities Management. Many often go further to obtain master's degrees in Facilities Management, Business Administration, Construction & Project Management, Energy Management, Environmental Health & Safety, Transportation Engineering and Urban Planning at institutions such as Columbia University, NYU, Hunter College, Pratt Institute and New York Institute of Technology.

GENERAL EDUCATION COMMON CORE

42-43 CREDITS

I – REQUIRED CORE (4 COURSES, 12-13 CREDITS)

English Composition (2 courses, 6 credits)

ENG 1101*	English Composition I	3
ENG 1121	English Composition II	3

Mathematical and Quantitative Reasoning (1 course, 3-4 credits)

MAT 1190	Quantitative Reasoning	3
or		
MAT 1275 or higher *. 1	College Algebra and Trigonometry	4

Life and Physical Sciences (1 course, 3 credits)

Any Approved Course	3
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II – FLEXIBLE CORE 2 (6 COURSES, 18 CREDITS)

Select one course from each of the following areas, plus one additional course from any of the five areas; no more than two courses may be selected from any discipline. 18

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Individual and Society

Any Approved Course

Creative Expression

Any Approved Course

Scientific World

Any Approved Course

One Additional Course in Any Category

Any Approved Course

III – COLLEGE OPTION REQUIREMENTS 3 (12 CREDITS)

- One course in Speech/Oral Communication
Any Approved Course (COM 1330 or higher) 3
- One interdisciplinary Liberal Arts and Sciences course
Any Approved Course 3
- Additional liberal arts credits to reach a minimum of 42 credits in general education.
In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language.
Any Approved Course 3
Any Approved Course 3

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS

77-78 CREDITS

Associate-Level Courses (37 credits)

Environmental Control Technology AAS
or
Architectural Technology AAS
or
Construction Management and Civil Engineering Technology AAS

Baccalaureate-Level Courses (39 credits)

FMGT 3510	Financial Analysis for Facilities Managers I	3
FMGT 3520	Anatomy of a Building	3
FMGT 3610	Project Management for Facilities Managers	3
FMGT 3620	Building Systems I	3
FMGT 3640	Principles of Facilities Management	3
FMGT 4710	Financial Analysis for Facilities Managers II	3
FMGT 4720	Building Systems II	3
FMGT 4740	Personnel Relations	3
FMGT 4900	Internship Project	3
or		
FMGT 4902	Special Projects in Facilities Management	3
LAW 2306 4	Legal Issues for Facilities Managers	3

MAT 1190	Quantitative Reasoning or		
MAT 1275 or higher	College Algebra and Trigonometry	Met as GenEd	
Select one of the four concentration areas			
Construction Management			
FMGT 4760	Construction Planning and Management I	3	
FMGT 4860	Construction Planning and Management II	3	
Select one of the following three courses for 3 credits:			3
FMGT 4750	Mechanical Systems Operation and Maintenance I		
FMGT 4780	Programming and Introduction to Space Planning		
ELECTIVE	(Program approval required)		
Space Planning and Design			
FMGT 4780	Programming and Introduction to Space Planning	3	
FMGT 4880	Space Planning	3	
Select one of the following three courses for 3 credits:			3
FMGT 4750	Mechanical Systems Operation and Maintenance I		
FMGT 4770	Urban Housing Management I		
ELECTIVE	(Program approval required)		
Facility Engineering			
FMGT 4750	Mechanical Systems Operation and Maintenance I	3	
FMGT 4850	Mechanical Systems Operation and Maintenance II	3	
Select one of the following three courses for 3 credits:			3
FMGT 4760	Construction Planning and Management I		
FMGT 4780	Programming and Introduction to Space Planning		
ELECTIVE	(Program approval required)		
Urban Housing Management			
FMGT 4770	Urban Housing Management I	3	
FMGT 4870	Urban Housing Management II	3	
Select one of the following three courses for 3 credits:			3
FMGT 4750	Mechanical Systems Operation and Maintenance I		
FMGT 4760	Construction Planning and Management I		
ELECTIVE	(Program approval required)		
FREE ELECTIVES			
Credits as indicated or as required to reach 120 credits for BTech			1-2
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES			77-78
TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS			42-43
TOTAL CREDITS REQUIRED FOR THE DEGREE			120
* Courses required for associate degree.			
1 Students without the requisite math background to enter MAT 1275 will be required to take MAT 1175 in preparation. This will increase the number of required credits for the degree by 4.			
2 Associate degree requires 12 credits from any 4 groups.			
3 Complete lists of liberal arts and sciences courses and advanced liberal arts courses, as well as semester-specific lists of interdisciplinary courses and writing intensive courses, are available online at the City Tech Pathways website .			
4 LAW 1202 is a potential course substitute for LAW 2306.			

COURSES:

ENVC 1110

Principles of Air Conditioning I

3 cl hrs, 3 cr

An introductory lecture course which teaches the basic principles, equations and analytical approaches used in the design of air conditioning systems. Students learn the physical principles of work, power, energy, pressure, specific volume, density, heat and enthalpy. They learn fundamental properties of steam and air, the pressure-temperature relationships of gases, basic principles of hot water and steam heating systems, and procedures for calculating heat losses from buildings.

Prerequisite: None

ENVC 1111

Air Conditioning Systems Laboratory I

3 lab hrs, 1 cr

An introductory laboratory course in which students become familiar with piping, tubing, ductwork, soldering, brazing, swaging, threading and flaring. Different types of gauges, manometers, measuring and testing instruments will be used to measure air velocity, pressures and densities of substances. Elements of electricity,

basic electrical control circuits and electrical test instruments will be introduced.

Prerequisite: None

ENVC 1120

HVAC Systems Graphics

1 cl hr, 2 lab hrs, 2 cr

A drafting course designed to train students to read and represent graphically in the heating, ventilating and air conditioning field. They learn to letter, draw linework, use drafting instruments and standard HVAC representations, draw orthographic and isometric projections of HVAC equipment, and work with architectural, structural and lighting plans to lay out HVAC systems.

Prerequisite: None

ENVC 1210

Combustion Processes and Equipment

3 cl hrs, 3 cr

A lecture course which teaches the design and operation of combustion equipment and boilers. Students learn the properties and handling of fuels, the chemistry of combustion, flame safety controls, boiler design and rating, gas and oil burners, boiler

maintenance and safety, design of breeching and stacks, and the control of air pollution caused by combustion.

Prerequisite: ENVC 1110

ENVC 1211

Heating Systems Laboratory

3 lab hrs, 1 cr

A laboratory course in which students work on oil burners, gas burners, steam and hydronic boilers, draft and combustion efficiency testing, boiler and burner safety and operating controls, reading control wiring diagrams and wiring electrical control components. Individual reports are required for each laboratory exercise.

Prerequisite: ENVC 1111; *Corequisite:* ENVC 1210

ENVC 1220

Hydronic Systems Design

2 cl hrs, 2 lab hrs, 3 cr

A theory, design and drafting course that teaches the procedures used in designing, analyzing and laying out hydronic systems. Students learn how to calculate the heating load of a building and piping friction losses, and the design criteria for boilers, convectors, valves, pumps and compression tanks. Students do

design projects including the drafting and designing of a complete hydronic system.

Prerequisites: ENVC 1110, ENVC 1111, ENVC 1120

ENVC 1250

Fire Protection, Plumbing and Electrical Systems for Buildings

3 cl hrs, 3 cr

A lecture course that surveys selected features and code requirements of building fire protection, plumbing and electrical systems. Students learn the basic principles of building fire safety with regard to building construction and means of egress, fire and smoke detection systems, sprinkler and standpipe systems and building fire safety personnel. The plumbing section of the course provides the student with information on plumbing system design, and how to determine the capacity and size of water supply and sanitary piping. Lighting design and selection, wiring and codes are covered in the electrical systems portion of the course.

Prerequisites: ENVC 1110, ENVC 1120; *Pre- or corequisite:* ENVC 1211

ENVC 2311
Refrigeration Laboratory I
3 lab hrs, 1 cr

A laboratory course in which students receive experience in installing, operating and maintaining refrigeration equipment. They learn methods of joining piping and tubing; compressor assembly and disassembly; use of analog and digital temperature and pressure instrumentation; and procedures for recovery, evacuation and charging of refrigeration systems under EPA guidelines. The final project requires students to work as team members to assemble, wire and install a complete refrigeration system. Individual reports are required for each laboratory exercise.

Pre- or corequisite: ENVC 2312

ENVC 2312
Principles of Refrigeration
3 cl hrs, 3 cr

A lecture course that covers refrigeration theory, applications, equipment and systems. Students learn the properties of various refrigerants, temperature-pressure relationships of saturated vapors, compression refrigeration and heat-pump cycles, operating principles of compressors, characteristics of evaporators and condensers, refrigerant flow control devices, applications of pressure-enthalpy diagrams of refrigerants, cooling tower theory and operation, selection and matching of refrigeration system components, and the operation and uses of absorption refrigeration systems.

Prerequisite: ENVC 1110

ENVC 2321
Air Conditioning Systems Laboratory II
3 lab hrs, 1 cr

A laboratory course that teaches methods to evaluate the performance of air handling and air conditioning systems. Students learn how to use a sling psychrometer, balometer, pitot tube and draft gauge, Alnor Velometer, anemometers, computer data loggers and sound level meters. They are introduced to operating, testing and calibrating procedures for HVAC system pneumatic controls. Students will work with different types of air conditioning equipment, from residential and small commercial split and packaged air conditioning and heat-pump systems, to a larger chilled-water system which uses a cooling tower and chilled-water distribution to separate air handlers. Students write individual laboratory reports on the performance testing of ducts, diffusers, controls and air conditioning systems.

Prerequisites: ENVC 1110, ENVC 1111; Pre- or corequisite: ENVC 2322

ENVC 2322
Principles of Air Conditioning II
3 cl hrs, 3 cr

A lecture course that teaches psychrometrics and cooling load calculation methodologies. Students learn to use psychrometric charts to determine the properties of air at various conditions, and the sensible and latent energy changes required to maintain specified comfort levels in occupied spaces. They also learn to calculate cooling loads using both computerized modeling software and manual methods in accordance with accepted industry practices.

Prerequisite: ENVC 1110

ENVC 2340
Air Conditioning Systems Design
2 cl hrs, 2 lab hrs, 3 cr

A computerized drafting and design course that teaches the procedures used in designing, analyzing and laying out air handling systems. Students learn to perform the calculations and analyses necessary to size ducts and accessories, determine pressure drops, lay out mechanical equipment rooms, specify fans and select diffusers and registers. They utilize AutoCad Computer-Aided Design and Drafting software to complete their drawing and design projects.

Prerequisites: ENVC 1110, ENVC 1120; Pre- or corequisite: ENVC 2322

ENVC 2401
Renewable and Hybrid Energy Systems
2 cl hrs, 2 lab hrs, 3 cr

Students will learn the principles of renewable and alternative energy systems and their applicability in meeting the energy needs of residential, commercial, and institutional facilities. They will be able to evaluate and compare the overall efficacy of alternative systems and to optimize the design and operation of these systems by taking into account sustainability, energy consumption, economics, and reliability.

Prerequisites: ENVC 1210, ENVC 1220, ENVC 1250

ENVC 2411
Refrigeration Laboratory II
3 lab hrs, 1 cr

A laboratory course in which students continue their experience in installing, operating and maintaining refrigeration equipment. They learn how to install refrigeration electrical controls and motors, procedures for testing and troubleshooting electrical systems, and how to operate chilled-water systems. Individual reports are required for each laboratory exercise.

Prerequisites: ENVC 2311, ENVC 2312

ENVC 2420
Principles of HVAC Systems Controls
3 cl hrs, 3 cr

A lecture course that introduces the principles of HVAC control systems design. Students are introduced to the theory of control and learn the methods of control of air conditioning, heating and refrigeration systems. They study HVAC control instrumentation, control devices, pneumatic control systems and electric and electronic control systems.

Prerequisite: ENVC 2322

ENVC 2421
Air Conditioning Systems Laboratory III
2 cl hrs, 2 lab hrs, 3 cr

A laboratory course in which students perform evaluations of chilled-water air conditioning systems, cooling tower water treatments and indoor air quality. They learn about the operation of boilers with dual fuel burners and hydronic heating systems. Also included are computerized HVAC Direct Digital Control systems, and acoustic and vibration analysis of mechanical equipment. Individual laboratory reports are required.

Prerequisites: ENVC 2321, ENVC 2322

ENVC 2432
Advanced Air Conditioning Systems Design
2 cl hrs, 2 lab hrs, 3 cr

An advanced theory and design course in which students specify and design a complete heating, air conditioning and ventilation system. Students calculate heating and cooling loads, write specifications, utilize building and energy codes, determine ventilation requirements, and specify mechanical systems and integrate them with the building construction. AutoCad and computerized load calculation software are utilized.

Prerequisites: ENVC 1220, ENVC 2322, ENVC 2340, MAT 1190 or higher

ENVC 2436
HVAC Systems Cost Estimating
3 cl hrs, 3 cr

A lecture course that teaches how to estimate the costs of HVAC systems. Students learn about the different types of estimates, estimating forms and methods, and company overhead, mark-up and budget prices. They also learn to estimate the costs of mechanical heating and cooling equipment, fans and blowers, cooling towers, pumps, tanks, piping, ductwork, air distribution devices, insulation, HVAC system controls and electrical power wiring. Students will be

required to complete a cost estimate for an entire air conditioning system project.

Prerequisites: ENVC 1210, ENVC 1220, ENVC 2340, MAT 1190 or higher;

Corequisites: ENVC 2420, ENVC 2432

ENVC 2442
Principles of Environmental Protection
3 cl hrs, 3 cr

A lecture course that covers the sources and control of air pollution caused by oil burners and incinerators, indoor air quality and noise control in HVAC systems. Students learn how residual oil burners are operated, controlled and maintained to minimize air pollution. They also learn how indoor air quality is maintained by HVAC systems and how an indoor air quality investigation is planned and performed. Basic acoustic terminology is also covered, along with sound level measurement procedures and noise control codes. Students complete term projects.

Prerequisites: ENVC 1210, ENVC 1211, ENVC 2321

ENVC 2452
Principles of Facility Energy Management
3 cl hrs, 3 cr

A lecture course in which students are taught the management tools and procedures which will enable them to track and control energy consumption in a large facility. The energy use characteristics of many types of facilities will be covered and analyzed. The course also provides students with the ability to perform an energy audit and to successfully implement a facility energy conservation program. Students will be required to assemble an energy conservation plan for a building and write a report as their final project.

Prerequisites: ENVC 1210, ENVC 1250, ENVC 2322, ENVC 2340

ENVC 2462
Sustainability, Energy Processes and Equipment
3 cl hrs, 0 lab hrs, 3 cr

This course provides students with the means to comprehensively evaluate the true sustainability and overall effect upon the environment of conventional and renewable energy sources and the facilities, systems, equipment and devices that consume energy.

Prerequisites: ENVC 1210, ENVC 1220, ENVC 1250

**ENVC 2900
Internship**

3 cr

120 hours of work experience in a heating, ventilating and air conditioning company, consulting engineering firm, or other related industry organization approved by the advisor. Each student will keep a log/journal to be shared in group seminars. Supervision will be by faculty and by a supervisor at the internship site.

Prerequisites: ENVC 2340, ENVC 2321

**FMGT 3510
Financial Analysis for
Facilities Managers I**

3 cl hrs, 3 cr

This course will teach students how to analyze and report on a facility's financial performance. Topics include revenue, operating and capital budgets and the use of tax incentives for financing facilities development. Present value techniques for analyzing a facility's long-term financing options and for evaluating capital improvement projects will also be covered. The use of computers to perform financial analyses is required.

Prerequisite: MAT 1190 or higher

**FMGT 3520
Anatomy of a Building**

3 cl hrs, 3 cr

This course will provide students with a systems perspective of facilities. Students will view buildings as a synthesis of interrelated and dependent systems, and observe these systems at various stages throughout their rated life to see the effects of aging, wear and maintenance on their performance. Students will also examine the characteristics that are typical of different types and ages of buildings.

Prerequisite: ENVC 1250 or CMCE 2319 or ARCH 2370 or equivalent

**FMGT 3610
Project Management for
Facilities Managers**

3 cl hrs, 3 cr

An introduction to the procedures for project management. How to maintain control of time and costs, allocate labor and other personnel effectively and apply these principles to actual situations. How computers are used to effectively manage projects is emphasized.

Prerequisite: FMGT 3510

**FMGT 3620
Building Systems I**

3 cl hrs, 3 cr

This course will teach students the fundamentals of utility services, costs, incoming power distribution systems, electrical maintenance and lighting systems. Topics covered will include

rate classifications, service protection, uninterruptible and emergency power supplies, co-generation systems, electrical distribution equipment and alternatives to existing utilities and vendors.

Prerequisite: FMGT 3520

**FMGT 3640
Principles of Facilities
Management**

3 cl hrs, 3 cr

Through case studies, students will learn the diverse skills that facilities managers must have to successfully fulfill their responsibilities in a variety of settings; commercial, institutional, health care, residential, governmental. This course will also prepare them to develop plans for the repair or replacement of a major building system, understand the impact of government regulations on the operation of a facility, and keep abreast of the technical changes affecting the facilities management industry.

Prerequisites: FMGT 3510, FMGT 3520

**FMGT 4710
Financial Analysis for
Facilities Managers II**

3 cl hrs, 3 cr

Students learn how to analyze expenses, identify controllable items, make comparisons to benchmark standards, establish achievable targets and develop and manage a cost-control program. Examples of proven cost-saving techniques will be used and the net effect upon the short- and long-term profitability and value of a facility will be determined. Topics covered will include energy costs, telecommunications costs, insurance premiums, labor costs and taxes.

Prerequisite: FMGT 3510

**FMGT 4720
Building Systems II**

3 cl hrs, 3 cr

Students will become familiar with facility management and building management computer systems, voice and data telecommunications systems, networking systems and the supporting infrastructure for all of these systems. They will also be taught the fundamentals of disaster planning, emergency management, environmental strategies and the issues which need to be addressed in planning for common and extraordinary occurrences that affect buildings.

Prerequisite: FMGT 3520

**FMGT 4740
Personnel Relations**

3 cl hrs, 3 cr

The management principles and practices involved in maintaining productive relationships with personnel will be emphasized.

Students will understand the leadership role of the facilities manager, learn how to work effectively within the structure of organizations, and develop the techniques that are used to make successful presentations to staff and higher levels of management. Topics covered will also include conflict resolution techniques, personnel management and training, work rules, OSHA and other labor laws and the collective bargaining process.

Prerequisite: FMGT 3510

**FMGT 4750
Mechanical Systems
Operation and Maintenance I**

3 cl hrs, 3 cr

Heating, domestic hot water and other ancillary systems in residential, commercial and institutional buildings. Study of computerized and manual techniques for managing, operating and maintaining these systems. Topics covered will include preventive maintenance, work orders, staff scheduling, diagnostic techniques, types of burners and boilers, heat distribution systems, direct and indirect fired domestic hot water systems and vertical transportation systems.

Prerequisite: FMGT 3520

**FMGT 4760
Construction Planning and
Management I**

3 cl hrs, 3 cr

Introduction to the basic principles of construction management. The relationship of the owner, designer and contractor in the construction process is discussed in detail. The main parts of a building contract are studied. This course emphasizes the role of the engineer, the on-site inspector and the superintendent. The fundamentals of the Critical Path Method and computer programs used in construction will be covered.

Prerequisite: FMGT 3610

**FMGT 4770
Urban Housing
Management I**

3 cl hrs, 3 cr

This course shows students how the relationships between tenants, owners, managers, banks, lenders, regulatory agencies and community groups affect urban housing management. Topics covered will include financial management, how to meet the immediate housing needs of tenants, how to provide a secure and habitable community, how facility managers can provide leadership and the different types of property and ownership. Term projects are required.

Prerequisites: FMGT 3510, FMGT 3520

**FMGT 4780
Programming and
Introduction to
Space Planning**

2 cl hrs, 2 lab hrs, 3 cr

Lecture and design course presenting procedures for programming a facility renovation, expansion or relocation. Introduction to space planning. Topics covered include procedures for determining if a facility renovation is necessary, roles and responsibilities of project management and management review teams, preparation of preliminary floor plans, establishment of space standards and basic design elements, workstations, space requirements questionnaires, blocking plans and stacking plans. Term projects are required.

Prerequisites: FMGT 3610, FMGT 3620

**FMGT 4850
Mechanical Systems
Operation and
Maintenance II**

3 cl hrs, 3 cr

Air conditioning, refrigeration and ventilation systems in residential, commercial and institutional facilities. Use of computerized and manual techniques for managing, operating and maintaining these systems. Topics covered will include preventive maintenance, compression and absorption refrigeration systems, air-handling systems, cooling towers and high-pressure boilers.

Prerequisite: FMGT 4750

**FMGT 4860
Construction Planning and
Management II**

3 cl hrs, 3 cr

The main parts of a building contract and the details of the relationships between the owner, designer and contractor in the construction process will be discussed. Bidding documents, financing, bonds, insurance and inspection as they relate to the construction industry will be covered.

Prerequisite: FMGT 4760

**FMGT 4870
Urban Housing
Management II**

3 cl hrs, 3 cr

A course in multi-family housing management that addresses the particular needs and concerns of urban housing regarding capital planning, resource allocation, operations and maintenance and security. Students learn how to comply with government agency regulations, complete reporting forms, follow procedures for filings and hearings, and manage the maintenance of multi-family housing mechanical, electrical and plumbing systems. Management techniques for avoiding

and resolving conflicts with tenants by providing timely service, maintenance and repairs will also be covered. Term project reports are required.

Prerequisite: FMGT 4770

**FMGT 4880
Space Planning**

2 cl hrs, 2 lab hrs, 3 cr

Lecture and design course presenting procedures for space planning for a facility renovation, expansion or relocation. Topics covered include scheduling and budgeting, schematic design, design development and preparation of construction documents.

Prerequisites: FMGT 4780 or ARCH 3511 with a grade of C or higher, ARCH 4861

**FMGT 4900
Internship Project**

3 cl hrs, 3 cr

120 hours of work experience in a facilities management organization or any related industry organization approved by the advisor. Each student will keep a log/journal to be shared in group seminars. Supervision will be by faculty and by a supervisor at the internship site. The program faculty will determine if students will be required to take FMGT 4900 or FMGT 4902. Those without sufficient experience in the facilities management field will take FMGT 4900. All others will take FMGT 4902.

Prerequisites: FMGT 3610, FMGT 3710, FMGT 3720

**FMGT 4902
Special Projects in
Facilities Management**

3 cl hrs, 3 cr

Projects, supervised by a faculty advisor, that are chosen for their special interest to students and their relevance to facilities management. Examples of individual projects are: developing maintenance, energy conservation, or emergency management plans for a facility; studying the effect of variable air volume systems on indoor air quality; and determining the effect of utility deregulation on the costs of operating buildings. An example of a group project would be two to four students from different disciplines preparing an assessment and capital improvement plan for a facility. The program faculty will determine if students will be required to take FMGT 4900 or FMGT 4902. Those without sufficient experience in the facilities management field will take FMGT 4900. All others will take FMGT 4902.

Prerequisites: FMGT 3610, FMGT 3710, FMGT 3720

**SUPT 1103
Building/Housing
Superintendent Carpentry
Laboratory**

3 lab hrs, 1 cr

This course introduces students to basic carpentry techniques for both new construction and repairs, typically employed in maintaining multi-dwelling buildings. Students become familiar with basic carpentry tools and their usage, e.g., tools for fastening, cutting, drilling holes, layout and gauging and clamping; wood construction materials and their appropriate usage; wall and ceiling construction and repair, e.g., drywall, wood and lathe walls; installation of interior and exterior doors and lock sets; and finished carpentry.

Prerequisite: None

**SUPT 1104
Multi-Dwelling Management,
Sanitation and Codes**

3 cl hrs, 3 cr

A lecture course that surveys the City of New York Housing Maintenance Code, the New York State Multiple Dwelling Law and other codes, laws and regulatory agencies that affect the role and functions of building superintendents. Employee management, contracting, purchasing and record keeping are also covered. The instructor demonstrates the operation and repair of key multi-dwelling building components and equipment.

Pre- or corequisite: ENG 092R or ESOL 031W or their equivalent

**SUPT 1206
Building/Housing
Superintendent Plumbing
Laboratory**

3 lab hrs, 1 cr

This course introduces students to components of the plumbing systems of buildings. The installation and repair of water closets, tubs, faucets, mixing valves and drain cleaning are included in the course.

Prerequisite: ENVC 1111

**SUPT 1261
Building Maintenance and
Repair Laboratory**

1 cl hr, 2 lab hrs, 2 cr

This course introduces students to the procedures used to maintain and repair both interior and exterior components of buildings. The maintenance and repair of electrical systems, lighting systems, fire protection systems, room air conditioners, valves, door systems and locks, windows, exterior walls and roofs are included.

Prerequisite: ENVC 1111

Mechanical Engineering Technology

Professor Sidi Berri, Chair
Voorhees Hall, room V 526
718.260.5233
email: sberri@citytech.cuny.edu

PROGRAMS:

Mechanical Engineering Technology/BTech (Bachelors)
Mechanical Engineering Technology/AAS
Industrial Design Technology/AAS

FACULTY:

Professors: Berri, Zhang
Associate Professors: Brahimi, Gailani, Vaisman
Assistant Professors: Ozlek, Nakamura, Rahman, Xiao, Yasar, Zhang

CLTs: Bennani, Cuevas

Associate in Applied Science in MECHANICAL ENGINEERING TECHNOLOGY

The Mechanical Engineering Technology program, accredited by the Engineering Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (ETAC/ABET), provides the fundamental knowledge and skills necessary for success in a broad range of technical careers. A balanced curriculum provides a solid foundation in the scientific and mathematical principles on which mechanical design is based, as well as ample hands-on experience in our well-equipped laboratories. Since no design can succeed in today's competitive environment unless it can be manufactured economically, studies in machine design, advanced solids modeling, applied mechanics, production methods and CNC/rapid prototyping (CAD/CAM) are integrated into the program. To prepare students for the rapid pace of technological change in the workplace, the program seeks to develop the kinds of creative design and problem-solving capabilities which never become obsolete.

Accreditation

The program is accredited by the Engineering Technology Accreditation Commission of ABET, <http://www.abet.org/>.

Program Educational Objectives for the AAS Degree in MET

- To be employed in entry-level positions as engineering technicians, assistant mechanical engineers, engineering research assistants, assistant mechanical designers, junior CNC operator/programmers, manufacturing technicians, and quality technicians.
- To be enrolled in a four-year mechanical engineering technology related program to continue their study.
- Practice effective oral, written, and graphical communication skills.
- To possess multidisciplinary concurrent engineering attitude and teamwork skills.

Student outcomes for the AAS Degree in MET

- an ability to apply the knowledge, techniques, skills, and modern tools of the mechanical engineering technology to narrowly defined engineering technology activities
- an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge
- an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments
- an ability to function effectively as a member of a technical team
- an ability to identify, analyze, and solve narrowly defined engineering technology problems
- an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature
- an understanding of the need for and an ability to engage in self-directed continuing professional development
- an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and
- a commitment to quality, timeliness, and continuous improvement

Program Criteria for the AAS Degree in MET

- Technical expertise in engineering materials, applied mechanics, and experimental Techniques/procedures.
- Technical expertise in manufacturing, computer-aided drafting/design, and machine/mechanical design/analysis
- Expertise in analysis of engineering data, applied energy/thermal/power system design/analysis

[Click here for annual enrollment and graduation data](#)

Mechanical engineering technology graduates find employment in industrial product design, automotive industry, implementation and operation, aerospace, mass-transit or marine vehicle design and production, design and construction of power generating stations, manufacturing industry, or public utility system planning and operation. Graduates may be employed as mechanical designers, engineering aides, robotics applications and service technicians, plant layout and production planning assistants, metallurgical technicians and materials testing technicians or in other similar capacities. Employers of graduates of this program include NASA/Columbia University Astrophysics Laboratory, Con Edison, National Grid, Verizon, Electrotech Service Equipment, Karp Associates Inc, Mazak Co., Scott Jordan Furniture Inc, Comco Plastics Inc, Metallized Carbon Co., research laboratories, architecture and construction companies and NYC Department of Environmental Protection.

Graduates of the curriculum may proceed directly into a bachelor's degree program in engineering technology, including the Mechanical Engineering Technology bachelor of technology program.

Alternatively, graduates may wish to pursue a bachelor's degree in engineering or engineering science available at a number of senior colleges around the metropolitan area. Transfer credits granted will depend on the policies and requirements of the individual institution.

GENERAL EDUCATION COMMON CORE ¹		28-30 CREDITS
I – REQUIRED CORE ² (4 COURSES, 14-15 CREDITS)		
English Composition (2 courses, 6 credits)		
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
Mathematical and Quantitative Reasoning (1 course, 4 credits)		
MAT 1375 or higher ³	Precalculus	4
Life and Physical Sciences (1 course, 4-5 credits)		
PHYS 1433	General Physics I: Algebra Based or	4
PHYS 1441	General Physics I: Calculus Based	5
II – FLEXIBLE CORE (4 COURSES, 14-15 CREDITS)		
In addition to the required courses listed below, select one course each from any two of the following four groups.		6
World Cultures and Global Issues		
Any Approved Course		
US Experience in its Diversity		
Any Approved Course		
Individual and Society		
Any Approved Course		
Creative Expression		
Any Approved Course		
Scientific World		
PHYS 1434	General Physics II: Algebra Based or	4
PHYS 1442	General Physics II: Calculus Based	5
One additional course from any group		
MAT 1475 or higher	Calculus I	4
Writing Intensive Requirement ⁴		
Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.		

PROGRAM-SPECIFIC DEGREE REQUIREMENTS		36 CREDITS
MECH 1101	Manufacturing Processes Laboratory	1
MECH 1201	Computer-Aided Manufacturing Systems	3
MECH 1222	Computer-Aided Engineering Graphics	2
MECH 1233	Statics and Strength of Materials	3
MECH 1240	Computer Applications in Mechanical Engineering Technology	2
MECH 2322	Engineering Materials	3
MECH 2333	Strength of Materials II	3
MECH 2335	Kinematics and Dynamics of Machines	3
MECH 2410	Machine Design or	
MECH 2900	Internship to Mechanical Engineering Technology	4
MECH 2426	Materials Testing Laboratory	1
MECH 2430	Thermodynamics	3
IND 1112	Engineering Drawing I	2
IND 2304	Advanced Solids Modeling	2
EET 1122	Circuit Analysis I	4
MAT 1375 or higher ³	Precalculus	Met as GenEd
PHYS 1433	General Physics I: Algebra Based or	
PHYS 1441	General Physics I: Calculus Based	Met as GenEd
PHYS 1434	General Physics II: Algebra Based or	
PHYS 1442	General Physics II: Calculus Based	Met as GenEd
MAT 1475 or higher	Calculus I	Met as GenEd
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES		36
TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS		28-30
TOTAL CREDITS REQUIRED FOR THE DEGREE		64-66
¹ Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.		
² Specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category.		
³ Students without the requisite math background to enter MAT 1375 must take MAT 1175, and/or MAT 1275 in preparation, depending on initial placement. This will increase the number of required credits for the degree by 4-8.		
⁴ A semester-specific list of writing intensive courses is available online at the City Tech Pathways website .		

Curriculum by Semester

For students earning an associate in applied science (AAS) degree with a major in Mechanical Engineering Technology.

FIRST SEMESTER		CREDITS
MECH 1101	Manufacturing Processes Laboratory	1
IND 1112	Engineering Drawing I	2
MAT 1375	Precalculus or higher	4
ENG 1101	English Composition I	3
PHYS 1433	General Physics I: Algebra Based	4
PHYS 1441	General Physics I: Calculus Based	5
Subtotal		14-15
SECOND SEMESTER		
MECH 1201	Computer-Aided Manufacturing Systems	3
MECH 1222	Computer-Aided Engineering Graphics	2
MECH 1233	Statics and Strength of Materials	3
MECH 1240	Computer Applications in Mechanical Engineering Technology	2
MAT 1475	Calculus I or higher	4
ENG 1121	English Composition II	3
Subtotal		17
THIRD SEMESTER		
IND 2304	Advanced Solids Modeling	2
MECH 2322	Engineering Materials	3
MECH 2333	Strength of Materials II	3
MECH 2335	Kinematics and Dynamics of Machines	3
PHYS 1434	General Physics II: Algebra Based	4
PHYS 1442	General Physics II: Calculus Based	5
Subtotal		15-16
FOURTH SEMESTER		
MECH 2410	Machine Design	4
MECH 2900	Internship to Mechanical Engineering Technology	4
MECH 2426	Materials Testing Laboratory	1
MECH 2430	Thermodynamics	3
EET 1122	Circuit Analysis I	4
GenEd Elective	Flexible Core	3
GenEd Elective	Flexible Core	3
Subtotal		18
TOTAL CREDITS REQUIRED FOR THE DEGREE		64-66

Associate in Applied Science in INDUSTRIAL DESIGN TECHNOLOGY

The Industrial Design Technology (IND) program is designed to provide students with a wide variety of valuable skills enabling them to utilize a number of 2D, 3D and animation/simulation software packages in several diverse fields. Job titles for graduates of this program include design manager, animation developer, industrial design systems manager, industrial product designer, project manager, CAD/CAM programmer and mechanical designer.

The Industrial Design Technology Program Educational Objectives are as Follows

- Graduates should be able to be employed in entry-level positions as industrial designers, CAD animation technicians, junior/senior quality assurance inspectors, skilled/junior testing technicians, CAD simulation technicians and quality technicians.
- Graduates should be able to be enrolled in a four-year Industrial Design/Mechanical Engineering/Technology-related program to continue their study.
- Graduates should practice effective oral, written and graphical communication skills.

The core of the program is a sequence of courses in CAD, beginning with the fundamental concepts of orthographic projection. Students begin to utilize CAD in the first and second semesters of a sequence with an emphasis on three-dimensional design. In the third semester, students learn industrial design processes and animation. They also learn to utilize CAD and other design software to produce technical illustrations which can be integrated into conventional computer-based publications. In the final semester, students learn to utilize one or more additional CAD software packages appropriate to industrial product design and to transfer CAD data to computer-aided manufacturing (CAM) systems. They learn to apply engineering design methodologies to real-world engineering problems using computer simulation and animation.

Building on the fundamental concepts of mathematics and physics, the program also develops the student's creative problem-solving capabilities with courses in strength of materials and computer programming. In addition, a course in engineering materials gives the student a storehouse of practical knowledge about the behavior of materials. Finally, a course in industrial design processes provides students with an opportunity to utilize all of these capabilities to carry out original design projects similar to those encountered in industry.

Employers of graduates of this program include industrial product design companies, automotive industry, aerospace industry, architecture and construction companies, Scott Jordan Furniture Inc., Con Edison, National Grid, Verizon, Comco Plastics Inc., Metallized Carbon Co. and the New York City Department of Environmental Protection.

While the primary purpose of this program is to prepare students for employment, graduates may transfer to a variety of four-year degree programs in technology, industrial design or other fields. Program graduates are eligible for the bachelor of technology in Computer Engineering Technology (formerly called electromechanical engineering technology) offered at City Tech. Students considering transfer to other colleges are urged to consult with the program coordinator or other faculty members as soon as possible in order to select courses which will provide the maximum possible number of potential transfer credits. In all cases, actual transfer of credit depends on the policies of the receiving institution.

GENERAL EDUCATION COMMON CORE¹		27-28 CREDITS
I – REQUIRED CORE² (4 COURSES, 14-15 CREDITS)		
English Composition (2 courses, 6 credits)		
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
Mathematical and Quantitative Reasoning (1 course, 4 credits)		
MAT 1275 or higher ³	College Algebra and Trigonometry	4
Life and Physical Sciences (1 course, 4-5 credits)		
PHYS 1433	General Physics I: Algebra Based or	4
PHYS 1441	General Physics I: Calculus Based	5
II – FLEXIBLE CORE (4 COURSES, 13 CREDITS)		
Select one course each from any three of the following groups		9
World Cultures and Global Issues		
Any Approved Course		
US Experience in its Diversity		
Any Approved Course		
Individual and Society		
Any Approved Course		
Creative Expression		
Any Approved Course		
Scientific World⁶		
Any Approved Course		
One additional course from any group		
MAT 1375 or higher	Precalculus	4
Writing Intensive Requirement⁴		
Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.		

PROGRAM-SPECIFIC DEGREE REQUIREMENTS		33 CREDITS
IND 1112	Engineering Drawing I	2
IND 2313	Industrial Design I	2
IND 2304	Advanced Solids Modeling	2
IND 2305	Industrial Management	2
IND 2340	Engineering Structures	2
IND 2401	Furniture Design	2
IND 2406	CAD Plant Layout	2
IND 2410	Industrial Design II	3
IND 2420	Engineering Animation and Presentation	2
MECH 1101	Manufacturing Processes Laboratory	1
MECH 1201	Computer-Aided Manufacturing Systems	3
MECH 1222	Computer-Aided Engineering Graphics	2
MECH 1233	Statics and Strength of Materials	3
MECH 1240	Computer Applications in Mechanical Engineering Technology	2
MECH 2322	Engineering Materials	3
MAT 1275 or higher ⁵	College Algebra and Trigonometry	Met as GenEd
PHYS 1433	General Physics I: Algebra Based or	
PHYS 1441	General Physics I: Calculus Based	Met as GenEd
MAT 1375 or higher	Precalculus	Met as GenEd
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES		33
TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS		27-28
TOTAL CREDITS REQUIRED FOR THE DEGREE		60-61
<p>¹ Although students enrolled in AAS programs are not required to meet all of the CUNY Pathways requirements, the college and program general education requirements are organized by Pathways categories to inform students of their standing should they transfer to a CUNY baccalaureate program.</p> <p>² Specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category.</p> <p>³ Students without the requisite math background to enter MAT 1275 must take MAT 1175 in preparation. This will increase the number of required credits for the degree by 4.</p> <p>⁴ A semester-specific list of writing intensive courses is available online at the City Tech Pathways website.</p> <p>⁵ Students without the requisite math background to enter MAT 1375 must take MAT 1175, and/or MAT 1275 in preparation, depending on initial placement. This will increase the number of required credits for the degree by 4-8.</p> <p>⁶ Students planning to attend the BTEch in Mechanical Engineering Technology program should consider taking MAT 1475 in the summer.</p>		

Bachelor of Technology in MECHANICAL ENGINEERING TECHNOLOGY

This multidisciplinary curriculum addresses both theory and hands-on experience with industry-standard tools in manufacturing systems, industrial design and robotics, providing the broad-based engineering technology education required to solve applied engineering problems through design and analysis. The interdisciplinary nature of this degree leads to expanded job opportunities and more flexible capabilities for its graduates. It is the only program in the New York City area to integrate engineering technology with industrial design and manufacturing.

The Mechanical Engineering Technology baccalaureate program addresses local, regional and national industry needs for high-level and highly skilled technologists and managers of emerging technology applications in industry. Manufacturing positions likely to survive in an age of global competition will be fundamentally different from the low-skilled jobs of the last century. To compete, manufacturers need a workforce capable of delivering high quality through the use of high technology.

The advancement of computer technology in both hardware and software over the past 40 years has completely revolutionized the way engineering technologists work. As a result, the traditional approach of mechanical engineering technologists to product design problems has become inadequate, giving too little attention to industrial design theories. Concurrent Engineering and Design, a process that combines engineering principles with industrial design theories throughout the product development cycle, has become the industry standard in product design and development. The role of industrial design in product design and development is of rapidly increasing importance. The BTech program in mechanical engineering technology reflects this new trend.

Program Educational Objectives for BTech Degree in MET

- To be employed as engineering technologist or designer.
- To be enrolled in graduate programs in mechanical engineering technology or other related engineering technology fields.
- To practice effective oral, written, and in graphical communication skills.
- To possess basic multidisciplinary concurrent engineering knowledge and teamwork skills.

Student outcomes for the BTech Degree in MET

- an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities
- an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.

- an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes
- an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives
- an ability to function effectively as a member or leader on a technical team;
- an ability to identify, analyze, and solve broadly-defined engineering technology problems
- an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
- an understanding of the need for and an ability to engage in self-directed continuing professional development
- an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
- a knowledge of the impact of engineering technology solutions in a societal and global context; and
- a commitment to quality, timeliness, and continuous improvement

Program Criteria for the BTech Degree in MET

- The program demonstrates an applied basis in engineering mechanics/science
- Students will be able to apply MET principals to the analysis, development, or oversight of advanced mechanical systems or processes.

[Click here for annual enrollment and graduation data](#)

Accreditation

This program is accredited by the Engineering Technology Accreditation Commission of ABET, <http://www.abet.org/>.

Prospective students are advised that additional work experience will be necessary to obtain a professional license. The program introduces students to leading-edge technology. The powerful 3D based parametric CAD and CAD/CAM packages (Autodesk Inventor, Solidworks, MasterCAM, etc.) are used to perform solid modeling, engineering analysis, and industrial design evaluation related to product design and manufacturing. But the program offers more than theory alone; it emphasizes a hands-on approach and is centered on practical industrial applications.

Students with associate degrees in mechanical engineering technology or industrial design can move seamlessly into the BTech program. Students coming from other backgrounds will be carefully placed to allow the most rapid entry possible into upper division mechanical engineering technology courses. For information about transfer opportunities, please call 1.718.260.5233 or email sberri@citytech.cuny.edu

GENERAL EDUCATION COMMON CORE**44-46 CREDITS****I – REQUIRED CORE¹ (4 COURSES, 14-15 CREDITS)****English Composition (2 courses, 6 credits)**

ENG 1101* English Composition I 3

ENG 1121* English Composition II 3

Mathematical and Quantitative Reasoning (1 course, 4 credits)

MAT 1275 or higher* College Algebra and Trigonometry (AAS in Industrial Design Technology)

MAT 1375 or higher*,² Precalculus (AAS in Mechanical Engineering Technology) 4**Life and Physical Sciences (1 course, 4-5 credits)**

PHYS 1433* General Physics I: Algebra Based or 4

PHYS 1441* General Physics I: Calculus Based 5

II – FLEXIBLE CORE* (6 COURSES, 20-21 CREDITS)

Select two additional courses not met at associate level. 6-8

World Cultures and Global Issues

Any Approved Course

US Experience in its Diversity

Any Approved Course

Individual and Society

Any Approved Course

Creative Expression

Any Approved Course

Scientific World

PHYS 1434* General Physics II: Algebra Based or 4

PHYS 1442* General Physics II: Calculus Based (AAS in Mechanical Engineering Technology) 5

MAT 1475 or higher Calculus I (AAS in Industrial Design Technology) 4*

One additional course from any group

MAT 1375 or higher* Precalculus (AAS in Industrial Design Technology)

MAT 1475 or higher* Calculus I (AAS in Mechanical Engineering Technology) 4

III – COLLEGE OPTION CREDITS³ (10 CREDITS)

- One course in Speech/Oral Communication
- Any Approved Course 3

- One interdisciplinary Liberal Arts and Sciences course
- Any Approved Course 3

- Additional liberal arts credits to reach a minimum of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course⁵ or two sequential courses in a foreign language.

MAT 1575 or higher Calculus II 4

Writing Intensive Requirement

Students at New York City College of Technology must complete two courses designated WI for the associate level, one from GenEd and one from the major; and two additional courses designated WI for the baccalaureate level, one from GenEd and one from the major.

PROGRAM-SPECIFIC DEGREE REQUIREMENTS**Associate-Level Courses (33-36 credits)**MAT 1375 or higher² Precalculus Met as GenEd

PHYS 1433 General Physics I: Algebra Based or

PHYS 1441 General Physics I: Calculus Based Met as GenEd

PHYS 1434 General Physics II: Algebra Based or

PHYS 1442 General Physics II: Calculus Based Met as GenEd

MAT 1475 or higher Calculus I Met as GenEd

Additional Required Courses for Students with an AAS in Industrial Design Technology:⁴ (7 credits)

MAT 1475 or higher Calculus I Met as GenEd

MECH 2333 Strength of Materials II 3

PHYS 1434 General Physics II: Algebra Based or

PHYS 1442 General Physics II: Calculus Based 4-5

Baccalaureate-Level Courses (36-41 credits)

MECH 3500 Computer Programming and Applications 3

MECH 3510 Advanced Solid Modeling II 3

MECH 3600 Mechanical Measurements and Instrumentation 3

MECH 3650 Advanced Strength of Materials 3

MECH 4700 Fluid Mechanics 3

MECH 4730 Finite Element Methods 3

MECH 4760 Vibration and Advanced Dynamics 3

MECH 4850 Senior Design Project 3

MECH 4860 Project Management⁴ 2

MAT 1575 Calculus II or higher Met as GenEd

MAT 2680 Differential Equations⁵ 3

In addition to the above, students must complete 12 credits from one of the three concentrations below. Students can substitute a course from a different concentration with the permission of a faculty advisor.

Industrial Design Concentration

MECH 3520 Rapid Prototyping 3

MECH 3550 Simulation and Visualization 3

MECH 3610 Product Design I 3

MECH 4710 Product Design II 3

MECH 4800 Advanced 3-Dimensional Animation 3

Manufacturing Systems Concentration

MECH 3530 Advanced Engineering Materials 3

MECH 3540 Manufacturing Systems 3

MECH 3620 Advanced Manufacturing Processes 3

MECH 4720 Plastics Product Manufacturing 3

MECH 4820	Computer-Integrated Manufacturing	3
Robotics Concentration		
MECH 3572	Embedded Systems and Applications in Robotics	3
MECH 3672	Actuators and Sensors Application in Robotics	3
MECH 4772	Control Systems in Robotics	3
MECH 4872	Robotic Systems Design and Applications	3
TOTAL PROGRAM-SPECIFIC REQUIRED AND ELECTIVE COURSES		77
TOTAL NYSED LIBERAL ARTS AND SCIENCE CREDITS		44-46
TOTAL CREDITS REQUIRED FOR THE DEGREE		121-123

* Courses that may have been required for associate degree

- 1 Specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category.
- 2 Students without the requisite math background must take MAT 1175, and/or MAT 1275 in preparation, depending on initial placement. This will increase the number of required credits for the degree by 4-8.
- 3 Complete lists of [liberal arts and sciences](#) courses and [advanced liberal arts](#) courses, as well as semester-specific lists of [interdisciplinary](#) courses and [writing intensive](#) courses, are available online at the [City Tech Pathways website](#).
- 4 Students entering with an AAS in Industrial Design Technology should work closely with a department advisor. They must also complete MAT 1475, PHYS 1434 or 1422, and MECH 2333. They are not required to take MECH 4860 Project Management.
- 5 MAT 2680 satisfies the requirement for an advanced liberal arts class in the College Option

COURSES:

IND 1112 Engineering Drawing I*

1 cl hr, 3 lab hrs, 2 cr
Introduction to CAD working environment, basic 2D geometric construction and orthographic projections, utilizing CAD systems.
Prerequisite: None

* Credit by examination, for those with appropriate experience, available for this course with department approval required

IND 2313 Industrial Design I (fall only)

2 cl hrs, 3 lab hrs, 2 cr
This course introduces students to the field of industrial design. It provides a framework for the development of design methodology. Students will use computers to create visual features of forms, configurations, patterns and ornaments involved in the product design. Emphases will be placed on the multidisciplinary approach and the integration of design and engineering. Students are required to utilize the knowledge they gained to produce various design projects.
Prerequisites: MAT 1175 or higher, IND 1112

IND 2304 Advanced Solids Modeling

1 cl hr, 3 lab hrs, 2 cr
Advanced modeling applications of design software in product design. Creation of 3D surfaces and solids from primitive shapes. Mass and surface areas are computed. Products designed by the student are rendered and shaded using CAD software. Data file conversions are developed for CNC application.
Prerequisite: MECH 1222

IND 2305 Industrial Management (fall only)

2 cl hrs, 2 cr
Management of modern industrial establishments including costing, product development, research and design for manufacturing as components of the industrial enterprise as a whole. Introduction to computer-managed production systems.
Prerequisite: None

IND 2340 Engineering Structures (fall only)

1 cl hr, 2 lab hrs, 2 cr
This course will introduce students to the engineering structures used in building, roadway and bridge constructions as well as those used in mechanical systems. First, students will be exposed to different types of structures and the corresponding loadings that they carry. Then, students will perform basic analysis on key structural components. Emphasis will be placed on the practical applications of the structures in each engineering field. Finally, students will produce design drawings using CAD software in major areas of engineering structures.
Prerequisites: MECH 1222, MECH 1233

IND 2401 Furniture Design (spring only)

1 cl hr, 3 lab hrs, 2 cr
Introduces art and science used in designing furniture. Topics include: Fundamental ideas of function and social use; Form, spatial organization, and typological orders; Structural integrity and composition; The design principles and design process; Materials selection and fabrication processes; Marketing and professional practice; and an historical overview of furniture design. Includes hands-on design projects.

Prerequisites: MECH 1233, IND 2304, IND 2313

IND 2406 CAD Plant Layout (spring only)

1 cl hr, 3 lab hrs, 2 cr
Applications of CAD software in industrial plant design. Creation of 2D floor layouts with consideration given to production quantities, material flow, inventory control, personnel requirements, environmental conditions and restraints, heating and lighting, equipment specifications. Alternate equipment placement configurations are developed to meet changing production needs. The student utilizes CAD software to develop the concepts and completes the term project with a 2D plant layout and a 3D rendering of the required facility.
Prerequisites: MECH 1201, MECH 1222

IND 2410 Industrial Design II (spring only)

2 cl hrs, 2 lab hrs, 3 cr
Continuation of IND 2313 Industrial Design I. This course adopts a hands-on approach to design problems. Students will use CAD/CAE programs to solve industrial design problems. Students will use rendering, shading, texture mapping and animation techniques to simulate effects of materials, finishes and moving parts related to machine design, civil architectural structures and product development. Students will be introduced to the advanced design features in solid modeling and will utilize the knowledge they gained from statics, strength of materials, material science and structural designs in various design projects.
Prerequisites: IND 2313, MECH 1233; Pre- or corequisite: IND 2304, MECH 1240

IND 2420 Engineering Animation and Presentation (fall only)

1 cl hr, 2 lab hrs, 2 cr
The goal of the course is to apply engineering design methodologies to real-world engineering problems using the computer as the central design tool, with emphasis on how to effectively test design concepts using computer simulation and animation. Students will learn techniques to present their design ideas through proper rendering of the 3D models. Students shall demonstrate their abilities to design and animate common motions used in mechanical systems as well as in architectural fly-around.
Prerequisites: MECH 1233, IND 2304

MECH 1101 Manufacturing Processes Laboratory

4 lab hrs, 1 cr
The lathe, horizontal and vertical milling machines, drill press and grinder (surface and pedestal). Basic operations performed on these different machine tools provide hands-on experience in basic manufacturing techniques and give students a better understanding of the processes they may eventually be called upon to recommend, design or update.
Prerequisite: None

MECH 1201 Computer-Aided Manufacturing Systems

2 cl hrs, 2 lab hrs, 3 cr
A continuation of Industrial Processes with emphasis on semi-production and the function of the methods engineer. Medium-run production equipment setup, economy, tolerance, fixtures, CNC programming using CAD/CAM and related planning are covered.

Also covered are press work, time and motion, machinability, feeds, speeds and job-cost estimating. Students' end-of-term reports include completion of a finished product incorporating modern manufacturing methods.
Prerequisite: IND 1112, MECH 1101;
Pre- or corequisite: MAT 1275 or higher

MECH 1222 Computer-Aided Engineering Graphics

1 cl hr, 3 lab hrs, 2 cr
The application of the principles developed in IND 1112 to more complex detail and assembly drawings. Subject areas covered are tolerancing for interchangeable manufacturing, design and layout of gears, gear trains, linkages and double auxiliary views. Laboratory work utilizes computer-aided drafting (CAD) systems.
Prerequisite: IND 1112; *Pre- or corequisite:* MAT 1275 or higher

MECH 1233 Statics and Strength of Materials

3 cl hrs, 1 lab hr, 3 cr
The foundation for most of the courses in the mechanical engineering technology curriculum and the basis of machine and structural design. Included are the basics in problem-solving, significant figures, dimensional analysis and engineering graphs. In addition, the following are covered in depth: statics, stress and strain, properties of materials, joints, thin-walled pressure vessels, centroid and center of gravity, moment of inertia and beam analysis and design.
Prerequisites: IND 1112, MAT 1275 or higher

MECH 1240 Computer Applications in Mechanical Engineering Technology

1 cl hr, 3 lab hrs, 2 cr
Computer applications in mechanical engineering technology that give the student a working knowledge in using the computer as a tool. The student develops programming skills in a modern, high-level programming language and applies these skills in performing engineering and technical calculations, data entry and data retrieval. The computer is also applied as a design tool. The student is introduced to computer graphics and to using the computer as a machine controller.
Prerequisites: IND 1112, MAT 1275 or higher

MECH 2322 Engineering Materials

2 cl hrs, 2 lab hrs, 3 cr
An introduction to physical metallurgy and engineering materials. Structure of materials and their applications. Properties of materials, ferrous and

non-ferrous metals, alloys, polymers, ceramics composites, adhesives and lubricants. Heat treatment, cold and hot working, phase diagrams and microstructure. Experiments are performed on hardness, plastic deformation, annealing, nondestructive testing, metallurgy and computer problem-solving.
Pre- or corequisite: PHYS 1433 or PHYS 1441

MECH 2333 Strength of Materials II

3 cl hrs, 3 cr
A continuation of MECH 1233 – Statics and Strength of Materials. Topics covered (with computer applications) are review of beam design, torsion, combined stresses, columns, working stresses, sharing and screw fasteners.
Pre- or corequisite: MAT 1375 or higher

MECH 2335 Kinematics and Dynamics of Machines

2 cl hrs, 2 lab hrs, 3 cr
Introduces students to the concepts of planar mechanisms such as linkages and cams. Students learn the basics of velocity, acceleration and force analysis of mechanisms using analytical, experimental and computer methods. They learn Newton's laws, work, energy, impulse, momentum, conservative force fields and impact. Rotation and plane motion of rigid bodies is introduced.
Prerequisites: MECH 1222, MECH 1233, MECH 1240; *Pre- or corequisite:* MAT 1375 or higher

MECH 2410 Machine Design

3 cl hrs, 2 lab hrs, 4 cr
Application of basic principles of design and analysis of selected machine elements such as brakes, clutches, springs, screws, shafts, bearings, cams, gears and gear trains. Students learn how to design simple and complex mechanical components and systems. The student should be able to synthesize a reasonable solution to a given design problem, analyze the proposed solution, judge its suitability and produce engineering drawings. End-of-term project with computer-aided oral presentation.
Prerequisites: MAT 1375 or higher, IND 2304; *Pre- or corequisites:* MECH 2333, MECH 2335

MECH 2426 Materials Testing Laboratory

2 lab hrs, 1 cr
Physical properties of steel, cast iron, concrete, timber and non-ferrous materials are determined using standard tension, compression, shear, torsion,

ductility, bending and hardness tests which are performed in accordance with ASTM standards. Utilization of strain gauges is introduced.
Prerequisites: MECH 1233, MECH 1240;
Pre- or corequisites: MAT 1475 or higher, MECH 2333

MECH 2430 Thermodynamics

3 cl hrs, 3 cr
Basic concepts of thermal energy conversion. Dual use of S.I. and English engineering units, gas laws, fluid processes, first and second laws of thermodynamics, theoretical cycles, internal combustion engines, gas turbines and jet engines, refrigeration cycles and the heat pump. Heat transfer through radiation, conduction and convection. Computer problem-solving.
Prerequisites: MECH 1233; *Pre- or corequisites:* MAT 1475 or higher, PHYS 1434 or PHYS 1442

MECH 2900 Internship in Mechanical Engineering Technology

1 cl hr, 8 field hrs, 4 cr
An alternative course to MECH 2410. Assignment to field work/study situations of approximately nine hours per week at one of the following; a local manufacturer, an engineering research company, or an engineering laboratory. Each student keeps a log/journal to be shared in group seminars and also completes a term report. Supervision by faculty and job supervisors.
Prerequisites: MECH 1201, MECH 1222, MECH 1240

MECH 3500 Computer Programming and Applications

2 cl hrs, 2 lab hrs, 3 cr
Introduces students to numerical methods and then applies methods to solve industrial design and engineering technology problems. Software packages such as Matlab, Labview, Solidworks and ProE are used to solve product design and analysis problems, including examples from mechanical engineering technology and industrial design.
Prerequisites: MECH 1240, MAT 1475 or higher

MECH 3510 Advanced Solid Modeling II

2 cl hrs, 2 lab hrs, 3 cr
A complementary course to IND 2304. Focuses on details of 3D modeling of mechanical systems including gears, cams, shafts, fasteners, sheet metals, welding, using different solid modeling techniques such as design accelerators and the content center.
Prerequisite: IND 2304

MECH 3520 Rapid Prototyping

2 cl hrs, 2 lab hrs, 3 cr
Introduces students to development of a new product. Explains major processes for rapid prototyping of a sample product before production, including stereo-lithography, powder (three dimensional printing); Solid (laminated-object manufacturing). Proper method selection for the process of rapid modeling of a sample product before mass production.
Prerequisites: MECH 1201, IND 2304

MECH 3530 Advanced Engineering Materials

2 cl hrs, 2 lab hrs, 3 cr
Both traditional and recently developed materials and processes, including material properties and how they change, extraction of metals, selection, application and processing of materials. Composite materials and their processing, plastics and protection of materials against corrosion.
Prerequisite: MECH 2322

MECH 3540 Manufacturing Systems

2 cl hrs, 2 lab hrs, 3 cr
Introduces students to the basic manufacturing processes presently utilized in industry. Describes behavior and manufacturing properties and fundamentals of materials and introduces students to different materials used in the industrial design field.
Prerequisites: MECH 1201, IND 2304

MECH 3550 Simulation and Visualization

2 cl hrs, 2 lab hrs, 3 cr
Introduces students to important aspects of a simulation study, and use of computer tools to visualize simulation model. Topics include simulation basics, planning, data collection and analysis, model building, model verification and validation, output analysis, experimental design, visualization technique.
Prerequisite: MAT 1475 or higher

MECH 3572 Embedded Systems Fundamentals and Applications in Robotics

2 cl hrs, 2 lab hrs, 3 cr
Introduces students in the MECH, CET, and EET programs to the applications of embedded systems in designing basic robotic systems or smart devices. Hands-on design activities help students to build prototypes for various robotic applications.
Prerequisite: GPA of 2.8 or higher and EET students only: EET 3112; MECH students only: MECH 1240
Pre- or corequisite: CET students only: CET 3510

**MECH 3600
Mechanical Measurements
and Instrumentation**

2 cl hrs, 2 lab hrs, 3 cr

Techniques, equipment, and measurement procedures used by Mechanical Engineering Technologists. Writing lab reports, performing data acquisition, and applying statistics to experimental data. Intensive laboratory to introduce measurement of temperature, pressure, mass flow rate, volume flow rate, force, mass, torque, translational and rotational motion transducers.

Prerequisite: MECH 1240, MAT 1475 or higher

**MECH 3610
Product Design I**

2 cl hrs, 2 lab hrs, 3 cr

Basic theory and key factors related to successful product design and development. Topics include basic product development processes, product opportunities identification, style and technology integration, value opportunities, brand strategy and product strategy, and integrated approach to product design. Case study method is used to demonstrate design process.

Prerequisites: MECH 1233, MECH 3510

**MECH 3620
Advanced Manufacturing
Processes**

2 cl hrs, 2 lab hrs, 3 cr

Advanced Manufacturing Processes in use in industry. Latest technologies in the manufacturing field such as rapid-prototyping, machine tools, and broaching and gear manufacturing. Micro machining, joining processes and equipment. Introduction to metrology and instrumentation, quality assurance, process design and process selection.

Prerequisites: MECH 1201, IND 2304

**MECH 3650
Advanced Strength of
Materials**

2 cl hrs, 2 lab hrs, 3 cr

Stress analysis, strain and stress relations, principal stresses, graphical method by Mohr's circles of biaxial and triaxial cases, generalized Hooke's law including thermal strains, equations of equilibrium, plane strain and plane stress problems. Failure theories and limit analysis. Euler critical loads for columns, curved beams, thick-walled cylinders and rotating disks, contact stresses, strain gauges and their application and stress concentrations.

Prerequisite: MECH 1233, MECH 2333, MAT 1575 or higher

**MECH 3672
Actuators and Sensors
Application in Robotics**

2 cl hrs, 2 lab hrs, 3 cr

An elective in the robotic concentration for the MECH, CET, and ETET programs for students who want to develop expertise in mechatronic product design and development. Teaches the design of robots and smart devices or systems using various sensor and actuators.

Prerequisite: EET students: EET 3122; Pre- or corequisite: non-EET students: CET 3615 or MECH 3572

**MECH 4700
Fluid Mechanics**

2 cl hrs, 2 lab hrs, 3 cr

Introduces students to the fundamental laws of statics, kinematics and dynamics applied to fluid mechanics. This course covers fluid properties, conservation of mass, momentum and energy, laminar and turbulent flows, and Navier-Stokes equations.

Prerequisites: MECH 3650, MAT 1575 or higher

**MECH 4710
Product Design II**

2 cl hrs, 2 lab hrs, 3 cr

Second course in product design sequence. Covers more advanced and in-depth topics in product design and development, including modeling of product metrics, design for manufacturing, design for the environment, analytical and numerical model analysis, physical prototypes, physical models and experimentation, and design for robustness. Design projects used to demonstrate implementation of design ideas.

Prerequisite: MECH 3610

**MECH 4720
Plastic Product Manufacturing**

2 cl hrs, 2 lab hrs, 3 cr

Introduces students to the world of plastics. Fundamentals of plastic materials and processing, commercial and engineering thermoplastics and thermosets. Manufacturing methods of plastics and changes of properties during the manufacturing processes of plastics. Definitions of plastics and polymers, strategic materials and the plastics industry.

Prerequisites: MECH 1233, MECH 2322

**MECH 4730
Finite Element Methods**

2 cl hrs, 2 lab hrs, 3 cr

Analysis of complex static and dynamic problems involves three steps: selection of a mathematical model; analysis of the model; interpretation of the predicted response. Course deals with deriving analytical solutions and comparing them with Finite Element Analysis.

Prerequisites: MECH 3650, MAT 2680

**MECH 4760
Vibration and Advanced
Dynamics**

2 cl hrs, 2 lab hrs, 3 cr

Solving vibration and dynamics problems related to product design and development. Free vibration, harmonic motion, viscous damping, response to harmonic excitation, general forced response, multiple-degree-of-freedom systems, design for vibration suppression, and vibration testing and experimental model analysis. Student submit design projects, using Matlab to solve vibration or dynamic problems related to product design and development.

Prerequisite: MAT 2680

**MECH 4772
Control Systems in Robotics**

2 cl hrs, 2 lab hrs, 3 cr

An elective course in the robotic concentration for the MECH, CET, and ETET programs. It provides a solid foundation in general robotic systems control for the design of smart mechanical devices with proper PID control techniques. It further enhances students' ability to engage in robotics and in new smart device development and testing.

Prerequisite: MECH 3672 or CET 3625 or EET 3212; Pre- or corequisite: MECH students only: MECH 4760

**MECH 4800
Advanced 3-Dimensional
Animation**

2 cl hrs, 2 lab hrs, 3 cr

Extends techniques learned in earlier industrial design courses (IND 2313 and IND 2410) and builds upon theories introduced in earlier animation courses (such as IND 2420). Foundation for advanced animation construction, incorporation of and integration with external media, and techniques to automate and optimize development processes. Dynamic particles, flexible soft body creation, texturing, "hair" particles, fluid simulation, rigging, lighting, and plant simulation.

Prerequisites: MECH 3510

**MECH 4820
Computer-Integrated
Manufacturing**

2 cl hrs, 2 lab hrs, 3 cr

Introduces computer-integrated manufacturing (CIM), the integration of manufacturing hardware and software systems. Describes production strategies and importance of CIM. Automated equipment and software solutions. Results of using CIM on all major elements of product design, and manufacturing production and operational control systems.

Prerequisites: MECH 1201, MECH 3510

**MECH 4850
Senior Design Project**

2 cl hrs, 2 lab hrs, 3 cr

Follow-up to earlier product design courses. Provides hand-on opportunity to practice concurrent engineering design, utilizing knowledge and skills acquired in early courses and applying them towards design and implementation of product, creating opportunity to experience team-based design under conditions that closely resemble current industry practice. Develop and sharpen skills in team organization, time management, self-discipline, and technical writing.

Prerequisite: MECH 4700, MECH 4730

**MECH 4860
Project Management**

1 cl hr, 2 lab hrs, 2 cr

Introduces basic project management concepts. Provides knowledge and skills necessary to plan, organize and control an information systems project. Includes project lifecycle management, cost management, risk management and schedule management.

Prerequisite: MECH 3500

**MECH 4872
Robotic Systems Design and
Applications**

2 cl hrs, 2 lab hrs, 3 cr

An elective course in the robotic concentration or the MECH, CET, and ETET programs. It provides an opportunity for students to engage in design and application of robotic technology to create new products and to design industrial and consumer robots.

Prerequisite: non-EET students: MECH 4772 or EET 4112; Pre- or corequisite: CET students only: CET 4864

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HUMAN SERVICES

Cecilia Farrell

Certified Nursing Assistant, Metropolitan Jewish Geriatric Center

Cheryl Frederick

Josephine Freeman

Matthew Ogle

MSW Student

LAW AND PARALEGAL STUDIES

Marianne Cutona Ritz

Deputy Chief Clerk, Appellate Term (OCA)

Rafael Dilones

Family Court Clerk, Family Court

Patrisia Duncan

Sr. Appellate Office Assistant, Appellate Term (OCA)

Marianne Gennari

Financial Compliance Manager, AML Compliance, HSBC

Jacqueline McMickens

Private Attorney, Jacqueline McMickens & Associates PLLC

Junia Mohamed-Roc, Esq

Hearing Examiner, New York City Board of Education

Cynthia Powder

Committee on Character and Fitness, Supreme Court Appellate Division, Second Department

Hon. Sara Schechter

Judge, New York State Family Court, New York County

Shophia Shaw

Paralegal Manager, Legal Aid Society

Sandra D. Wilson

Sr Executive Asst to the General Manager, A.A. World Services

MECHANICAL ENGINEERING TECHNOLOGY

Jack Abel

Vice President, Watermark Designs

James M. Callahan

Senior Assoc, ARCADUS U.S., Inc.

Leonardo Cuevas

Plan Manager, Scott Jordan Furniture

Robert Gencorelli, PE

Senior Designer, Camp, Dresser & McKee (CDM)

Anthony Giuliani

Liaison Engineer, Bureau of Engineering Design and Construction Division of In-House Design

Eugene Irving

NYCDEP

Scott Jordan

President, Scott Jordan Furniture

James M. Lauria

Project Manager, URS Corp.

Thomas Schoettle, PE

Vice President, Camp Dresser & McKee (CDM)

Robert Vecchio, PE

President, Lucius Pitkin, Inc.

NURSING

Libby Carter-Otuya

Nurse Initiatives Manager, NYC Dept of Health and Mental Hygiene-Nurse Family Partnership

Catherine Gallogly-Simon

Chief Nursing Officer, Wyckoff Heights Medical Center

Ellen Heasley

Director, Nurse Recruitment, New York University Langone Medical Center

Mei Kong

Senior Director, Accreditation & Regulatory Services, New York City Health and Hospitals Corporation

Marilyn Lotas

Professor, Director of Baccalaureate Program, Case Western Reserve University

Pat Lynch

Professor, New York City College of Technology, retired

Janet Mackin

Dean (Retired), Phillips Beth Israel School of Nursing

Diane J. Mancino

Executive Director, National Student Nurses' Association, Inc.

Terry Mancher

Chief Nursing Officer, Coney Island Hospital

Ellen McGuinn

Retired Professor, New York City College of Technology

Maryanne Radioli

Director of Nurse Recruitment, Maimonides Medical Center

Roseanne Raso

Associate Executive Director, Patient Care, Lenox Hill Hospital North Shore

Kathryn Richardson

Professor Emeritus, New York City College of Technology

Susan Saladino

Chairperson, Dept of Nursing, St. Francis College

Thomas Smith

Chief Nursing Officer and Senior Vice President, Maimonides Medical Center

Dan Suarez

Associate Director of Advertising-NY Division, Gannett Health Care Group

RADIOLOGIC TECHNOLOGY AND MEDICAL IMAGING

Ed Asante

Administrator of Radiology, Beth Israel Medical Center

Serafina Ayllon

Administrator, Radiology, Mount Sinai St. Luke's and Mount Sinai- Roosevelt Hospital Center

Declan Doyle

Senior Vice President, Maimonides Medical Center

Charles Drago

Chairperson, Radiologic Technology, Hostos Community College

Jewel Trowers Escobar

Executive Director, New York City College of Technology Foundation

Frank Galante

Coordinator of Radiology, Department of Radiology, Lutheran Medical Center

Steven Hermann

Senior Director of Imaging Services, NY Presbyterian Hospital-Weill Cornell Center

Darren Hoyte

Director of Radiology, The Brooklyn Hospital Center

Kathleen R. Kennedy

Director of Imaging Services, Mercy Medical Center

Timothy Lomax

Lithotripsy Specialist, United Medical System

George Lowe

Administrative Director—Imaging, Mercy Medical Center

Virginia Mishkin

Director, Radiologic Technology Program, Bronx Community College, The City University of New York

Vascenio Rhoden

Associate Director, Radiology, Woodhull Medical and Mental Health Center

Liana Tsenova

Associate Professor, Biology, New York City College of Technology

Elizabeth Valderrama

Chief Mammography Technologist, Cornell Medical Imaging

Lawrence Walker

Manager, Radiology, Memorial Sloan-Kettering Cancer Center

RESTORATIVE DENTISTRY**Bill Baum**

Lab Owner, DLANY Officer

Burnie Croll, DDS

Prosthodontist, Private Practice

Nicholas Deluca

Sales Representative, Dentsply

Anthony Fescina

Dental Technologist and Owner, Prime Dental Laboratory

Leonard Kobren, DDS

Prosthodontist, NGS Officer

Justin Marks

President, Master-Touch Dental Lab

Luis Mejia

Alumnus, Laboratory Owner

Greg Montgomery

Sales Operation Manager, Dentsply

Frank Munzenmayer

Alumnus, Technical Specialist, Argon Dental

Peter Nagy

Owner, Valplast International

Ralph Rega

Dental Laboratory Owner, Technologist; President, LI Dental Laboratory Association

Leonard Ricci

Technical Representative, C.M.P. Industries

Rebecca Schmucker

Technician, Veteran's Affairs

Anna Verano

Alumna, Manager Dental Technology, Ivoclar Vivaden Manufacturing

Danny Wong

Consultant, DRW Dental Consulting

VISION CARE TECHNOLOGY**Ethan Brown**

Licensed Optician

Laura Frezza

Owner and Licensed Optician, West and Stannish Opticians

Bill Galindo

President, Bill Galindo Associates

Thomas Guthlein

Optician, East End Eye Associates

Terri Haberman

Optometrist, Cohen's Fashion Optical

Nancy Kirsch

Professor, SUNY College of Optometry

Philip Meltzer

Optometrist

Anthony Rebaldo

Optician

Barry Santini

Optician, Long Island Opticians

Sheldon Seecharan

Clara Barton High School

Mike Tilleli

District Regional Manager, Coopervision

Mark Turturro

Vice President, E.B. Meyrowitz & Dell

Danne Ventura

Director, Professional Relations, Essilor of America

Robert Wallner

Owner, OptikWallner

Participating Agencies

Several programs rely upon off-campus clinical settings for students to receive practical training in their fields. The cooperating agencies and/or individuals are listed below.

HUMAN SERVICES FIELD PRACTICUM

ACRMD

Administration for Children's Services

Agency for Child Development

Alpha School Center for Progressive Living

American Red Cross of Greater New York, Brooklyn Chapter

Bedford Stuyvesant Family Center

Bishop Henry B. Hucles Episcopal Home

B.R.C. Human Services Corporation

Brooklyn Aids Task Force

Brooklyn Bureau of Community Services Inc.

Brooklyn Community Housing and Services Inc.

Brooklyn Developmental Disabilities Center

Brooklyn Domestic Violence Court

Brooklyn Hospital

Brooklyn Residential Center-OCFS

Caribbean Women's Center

Catholic Charities of Brooklyn

Center for Family Life

Chelsea Adult Day Health Center

Cobble Hill Nursing Home

ComAlert

Community Counseling and Mediation

Community Mediation Services, Inc.

Concord Family Services, Inc.

Covenant House

Crown Heights Service Center

Day Top Village

Dominican Sisters Family Health Service

East Harlem Neighborhood Based Alliance

Family Justice Center

FECS, Inc.-Twin Bridges Clubhouse

Flatbush Addiction Center

Flatbush Haitian Center

Fort Greene SNAP

Friends of Crown Heights

Green Chimneys Children's Services

Housing Works

Human Resources Administration

Incarcerated Mothers Program

Independent Living Association

I.S. 59

I.S. 126 The Albert Shanker School

Jackie Robinson Center for Physical Culture

Jewish Community Center of Canarsie

Jewish Hospital and Medical Center of Brooklyn

Kingsboro Addiction Treatment Center

Kings County Hospital Center

Lower East Side Service Center

Metropolitan Jewish Geriatric Center

Middle School 126

Middle School 352

New Hope Guild

New York Center for Addiction

Treatment Services

New York City Department of Juvenile Justice

New York City Human Resources Administration

New York Methodist Hospital/Caregiver's Program

NYU Downtown Hospital

New York University Hospital for Joint Diseases

Office of the District Attorney (Kings County)

Park Slope Shelter

Parkway Hospital

Planned Parenthood

Project Ace (NADAP)

Project Chance
 Project Teen Aid
 PSCH
 P.S. 44
 P.S. 137
 P.S. 151
 P.S. 161
 Queens Center for Progress
 Queens Village Committee for
 Mental Health for J-CAP, Inc.
 RAICES
 Ridgewood Bushwick Home Care
 Agency
 Rutland Nursing Home
 Safe Horizon-Families of
 Homicide Victims Program
 Salvation Army, Bond Street
 Science Skills Center High School
 SCO Family of Services
 Self Help Community Services, Inc.
 Shore View Nursing Home
 St. John's Bread of Life
 St. Vincent's Service
 The Bowery Mission Women's
 Center
 The Dennelesse Corporation
 The New York Methodist Hospital
 Turning Point/Discipleship
 Outreach Ministries Inc.
 United Cerebral Palsy
 United Community Centers
 Urban Strategies Day Care II
 Urban Women's Shelter
 Victims Services Agency
 Village Nursing Home
 Woodhull Medical and Mental
 Health Center
 Woodhull Outpatient Clinic
 Wyckoff Heights Medical Center
 YAI/National Institute for People
 with Disabilities
 Young Adult Institute
 YWCA

Clinical Associates

NURSING

Alison Abrosch

Director, Nursing Education and Research, Coney Island Hospital

Agatha Anosike

Sr Assoc Director, Nursing Education Research and Quality IMprovement, Kings County Hospital Center

Bonnie Berman

Director of Psychiatry Nursing, Maimonides Medical Center

Anne Bove

Director of Nursing Education, Bellevue Hospital Center

Rosemarie Calcano

Director of Nursing Education, Kingbrook Jewish Medical Center

Ines DeLaNuez

Director, Grand St Settlement

Paula Delfino

Director of Nursing Education, Maimonides Medical Center

Doug Dizon

Director of Nursing Education, The Brooklyn Hospital

Robert Doxsey

Deputy Director, Stein Senior Center

Angela Edwards

Chief Nurse and Executive Director of Nursing, Woodhull Medical and Mental Health Center

Carolyn English

Director, Cooperators Advocacy Alliance, Masaryk Towers

Jerry Jennings

Director, Community Access

Melissa Marrero

Manager, College Relations, Visiting Nurse Service of New York

Michelle Neugebauer

Executive Director, Cypress Hills Local Development Corporation

Epifania C. Quimson

Director of Nursing Education, Lutheran Medical Center

Medel Salvatore-Paguirigan

Coordinator, Nursing Research and Education, Department of Nursing Education, Research, and Professional Practice, The Mount Sinai Hospital

Nancy Spannbauer

Director, Penn South Program for Seniors

Leila Taqueban

Director of Nursing Education, Elmhurst Hospital Center

Dorette Williams

Director of Nursing, Boro Park Center for Rehabilitation and Healthcare

RADIOLOGIC TECHNOLOGY AND MEDICAL IMAGING

Rodney Addison

Administrative Director of Radiology, Maimonides Medical Center

Deborah Als

Radiology Administrator, Brookdale University Hospital and Medical Center

Seraphin Ayllon

Administrator, Radiology, Mount Sinai St. Luke's

Karen Buono

Administrative Asst of Radiology, Brooklyn Hospital Center

Hope Copperstone

Administrative Director of Radiology, New York Presbyterian: Hospital/ Columbia Presbyterian Center

Wilson Davila

Administrative Director of Radiology, NYU Lutheran Medical Center

Denise DeConca

Asst Chief Technologist, Brookdale University Hospital and Medical Center

Declan Doyle

Senior Vice President, Maimonides Medical Center

Olivia Fishkin

Technical Coordinator, Radiology, Mount Sinai- Roosevelt

Vascenio Rhoden

Director & Associate Director, Radiology, Woodhull Medical and Mental Health Center

Linda Sanatar

Manager of Radiology, New York Presbyterian Hospital/Weill Cornell Medical Center

Roy Thompson

Manager, Radiology, New York Presbyterian: Columbia Presbyterian Center

Ed White

Vice President of Radiology Hospital for Special Surgery

Information on Certificate Programs Offered at New York City College of Technology

New York City College of Technology/CUNY offers the following certificate programs:

HEGIS Code	Name of Certificate	Academic Department
5317	Construction Management	Construction and Civil Engineering Technology
0899.5	Technology Teacher Education Transitional C	Career and Technology Teacher Education

Tuition and Fees

Tuition: Resident Students

- Full-time matriculated \$3,265 per semester
- Part-time matriculated \$285 per credit
- All Non-degree \$415 per credit
- Senior citizen fee \$65 per semester or session

Tuition: Non-Resident Students

- Full-time or part-time matriculated \$580 per credit
- All Non-degree \$865 per credit

Fees

ALL Students (including non-degree and senior citizens)

- Consolidated Services Fee \$15.00 per semester or session

Non-Instructional Fees

Full-Time Students (12 or more credits and/or remedial contact hours) per semester:

- Student Activity Fee \$59.20
- University Student Senate Fee \$1.45
- Technology Fee* \$125.00
- Consolidated Service Fee \$15.00
- Total Fees \$200.65**

Part-Time Students (Fewer than 12 credits and/or remedial contact hours) per semester:

- Student Activity Fee \$27.35
- University Student Senate Fee \$1.45
- Technology Fee* \$62.50
- Consolidated Service Fee \$15.00
- Total Fees \$106.30**

A full listing of the components of the Student Activity Fee can be found at <http://www.citytech.cuny.edu/admissions/tuition-non-instructional.aspx>

The City Tech certificate programs prepare people for the following professions, as classified using the current Federal Standard Occupational Code (SOC):

CONSTRUCTION MANAGEMENT

47-1011 Supervisors of Construction and Extraction Workers

TECHNOLOGY TEACHER EDUCATION TRANSITIONAL C

25-2023 Career/Technical Education Teachers, Middle School (provisional)

25-2032 Career/Technical Education Teachers, Secondary School (provisional)