

New York City College of Technology

Architectural and Engineering Tech

Public Service, Career and Technology Transfer Education

Summer Programs

CATALOG

2011-
2013

Design, Entertainment and Emerging Media Tech

Healthcare Professions

Science, Mathematic and Liberal Arts

Information Technology

www.citytech.cuny.edu

Law & Paralegal Studies and More

MISSION STATEMENT

New York City College of Technology is the designated college of technology of The City University of New York, currently offering both baccalaureate and associate degrees, as well as specialized certificates. New York City College of Technology serves the city and the state by providing technically proficient graduates in the technologies of the arts, business, communications, health and engineering; human services and law-related professions; technical and occupational education; and liberal arts and sciences. The College provides access to higher education for New York City's diverse population and assures high quality in its programs by a commitment to outcomes assessment. The College also serves the region by developing partnerships with government agencies, business, industry and the professions and by providing technical and other services.

Education at New York City College of Technology provides students with both a command of skills necessary in their respective career areas, and the educational foundation for lifelong learning. All degree programs are built upon a liberal arts and science core curriculum designed to foster intellectual curiosity, an appreciation for the aesthetic dimension of life and work and a respect for cultural diversity. Students obtain practical experience in their chosen fields in a variety of settings. The College further encourages student growth and development through academic and student support services and a wide array of student activities.

EDUCATION GOALS

Career Goals

A City Tech graduate will

- possess the ability to transfer knowledge and skills
- function well in a variety of work environments
- communicate clearly in written and oral presentation
- apply problem-solving techniques to the workplace
- work effectively as a member of a project team

Life Goals

A City Tech graduate will

- understand the scientific and technical framework within which modern society functions
- achieve a high degree of information literacy, using information technology to seek, obtain and utilize information resources for self-learning, problem-solving and personal growth
- understand the aesthetic dimension of life
- understand the economic, societal and cultural aspects of the environment
- understand the ethical responsibilities and implications of one's work and personal actions

NOTA BENE

This issue of the catalog is published for academic years 2011-2013. 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, www.citytech.cuny.edu/catalog/index.html, 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.

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, 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 National League for Nursing Accrediting Commission (NLNAC), the Technology Accreditation Commission of the Accreditation Board for Engineering Technology (TAC/ABET), the Commission on Opticianry Accreditation and the National Council for Accreditation of Teacher Education (NCATE).

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.

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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 16,000 students in 62 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. A full list of programs can be found on pages 44 and 45.

- The College also reaches about 16,000 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/academics/continuinged/index.shtml>.
- 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, and the certificate programs in Interactive Media Technology and in Sustainable 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 the surrounding MetroTech business district. Students have many opportunities to get involved in the life of the community and to take advantage of the vitality of the new Downtown Brooklyn.
- 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 85,000 graduates; most 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
 1114 Avenue of the Americas 15th Floor
 New York, NY 10036
 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://www1.cuny.edu/admissions/undergraduate/onlineapp-1.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 120-credit bachelor's degree. 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, facilities management, graphic arts production management, hospitality management, entertainment technology and telecommunications engineering technology; the bachelor of science in applied mathematics, health services administration, human services, nursing and legal assistant studies; the bachelor of science in education in career and technical teacher education and technology teacher education. Students may apply to these programs as freshmen or as transfer students, whether they have completed an associate degree or not. Refer to program descriptions for further clarification.

Freshman Applicants into a Baccalaureate Degree

The College has established the following minimal standards for direct 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, high school average and College Preparatory Initiative units. 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, pg 11).

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). Students who have not yet attained these proficiencies may be required to complete developmental courses before they can continue into their major courses and into the baccalaureate program.

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.uapc.cuny.edu>. The College provides additional information for international students on its website at www.citytech.cuny.edu/admissions/generalinfo.

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 G.E.D. examinations or currently attend or previously attended an accredited U.S. college, 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 formerly attended City Tech but have not been in attendance for the entire previous semester or longer, you must apply to the Office of the Registrar at New York

City College of Technology for readmission. A \$10 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 Admissions Services. The application is available online at http://www.citytech.cuny.edu/admissions/ge_ernalinfo/special.shtml. 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

Effective for the spring semester of 2011, 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
 285 Adams 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 Exams** in English Language Arts and Mathematics (Math A or B, or Sequential II or III and the New Math Regents*).

*New Math Regents Proficiency Criteria

Freshmen admissions for Fall 2011 - Spring 2012 only - Regents score of 75 on either Integrated Algebra, Geometry or Algebra 2 and Trigonometry and successfully completing each course in the three course Regents sequence; Integrated Algebra, Geometry, Algebra 2 and Trigonometry.

Freshmen and Transfer admissions for Fall 2012 and thereafter, students may demonstrate proficiency by passing at least one of the three New York State Regents examinations in mathematics (Integrated Algebra, Geometry, Algebra 2 and Trigonometry) with a scaled score of 80 or higher and successfully completing Algebra II and Trigonometry or a higher level math course.

- **By achieving a score of 480 or above on the SAT Verbal/Critical Reading and 500 on the SAT Mathematics sections.**
- **Transfer students**-Admissions requirement for math may be met by earning a grade of C or better in a 3 or more credit college-level math course. Requirements 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 requirement by passing CUNY Assessment Tests which are offered 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 competency 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 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 or the New Math Regents* (based on the semester of admission) or a score of 500 or above on the SAT Mathematics Test 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://web.cuny.edu/academics/oa/testing.html>

COLLEGE PLACEMENT POLICY

In addition to the requirements described above, students 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 from the School of Liberal Arts and Sciences and 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 will take effect for Fall 2007 freshmen. 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.

* *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 Office of Student Support.*

**TABLE 1
EXEMPTION CRITERIA FOR CUNY ASSESSMENT TESTS**

Test	Exemption Criteria
Math	<p>≥ 500 on the Math portion of the SAT (≥ 21 on the ACT)</p> <p>≥ 75 or higher on the NYS Math A or B, Sequential II or III Regents Exam or the New Math Regents.*</p> <p>Transfers only- A three or more credit Math course with a grade of C or better from an accredited college or university</p>
Reading	<p>≥ 480 SAT Verbal/Critical Reading score ≥ 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 better from an accredited college or university</p>
Writing	<p>≥ 480 on the Verbal/Critical Reading portion of the SAT (≥ 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 better 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	<p>≥ 35 Pre-Algebra ≥ 40 Algebra</p>	less than or equal to 21
Writing	≥ 56	less than 46 unless Writing score is 40-45 and Reading score is 65 or higher
Reading	≥ 70	less than or equal to 59

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.

If you have any questions about residency, please 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 the Fall 2012)

Full-time Matriculated	\$2,715/semester
Part-time Matriculated	\$230/credit
Non-degree	\$340/credit
Senior Citizen Fee	\$65/semester or session

ALL NON-RESIDENT STUDENTS

(These new rates are effective for the Fall 2012)

Full-time or Part-time Matriculated	\$485/credit
All Non-degree	\$720/credit

Tuition Rates for Undocumented and Out-of-Status Aliens

Effective Spring 2002, 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	\$42.70
Student Government	\$7.00
Technology Fee	\$100.00
University Student Senate Fee	\$0.85
NYPIRG Fee	\$4.00
Consolidated Service Fee	\$15.00
Total Fees	\$169.55

Part-Time Students

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

Student Activity Fee	\$16.35
Student Government	\$3.00
Technology Fee	\$50.00
University Student Senate Fee	\$0.85

All Students

(Including Non-Degree and Senior Citizens)

Consolidated Service Fee	\$15.00
Total Fees	\$85.20

Student activity fees, University student senate fee and the consolidated service fee or any part thereof are not refundable at any time.

The NYPIRG 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

At its February 25, 2002 meeting, the Trustees of The City University of New York voted to establish a technology fee of \$100.00 per semester for full-time students and \$50.00 per semester for part-time students, including the summer, effective Fall 2008. Revenue from this fee will be retained by the individual colleges to improve computer services for their students and faculty.

SPECIAL FEES

Freshman Application Fee non-refundable	\$65
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Transfer Application Fee non-refundable	\$70
(for non-CUNY transfers and CUNY transfers who have had a break in attendance of one semester or more)	
Transcript Fee	\$7
Transcript fee will be waived between units of The City University of New York.	
Special Examination Fee	\$25
(each additional)	\$5
When a student requests an examination at a time other than the scheduled time and permission is granted by the College, a special examination fee is charged. However, there is a maximum fee of \$25 per semester.	
Duplicate Identification Fee	\$10
A charge for replacement of I.D. cards	
Duplicate Bursar Receipt/Bill Fee	\$5
A charge for each bursar receipt bill	
Duplicate Diploma Fee	\$15
A charge to students for each duplicate diploma or certificate	
Re-admission Fee	\$10
A charge to students who are readmitted to the College after an absence of one or more semesters (exclusive of summer session), applied to the first term bill.	

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	\$15
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Checks returned unpaid to the College by a financial institution, no matter the amount or reason for the return, will automatically incur a \$15.00 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

Sandra Higgins, Director
Namm Hall, room N/G 13
300 Jay Street
Brooklyn, New York 11201
Phone: 718.260.5700
email: shiggins@citytech.cuny.edu

New York City College of Technology (NYCCT) participates in all state and federal 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 in regular installments over a prescribed period of time. Work-Study consists of part-time employment, either on campus or in an outside agency.

For financial aid purposes, a student is considered to be full-time if he or she is registered for a minimum of 12 credits or equated credits within the semester. A student is considered part-time if he or she is registered for fewer than 12 credits or equated credits 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 the student should complete online at www.fafsa.gov. To begin, the student should apply for a federal PIN (Personal Identification Number) at www.pin.ed.gov. If the student is dependent, his or her parents should also apply for a PIN. With the PIN, the student can apply, make corrections and access his/her federal financial aid information easily.

When the student completes the FAFSA, the student is applying for a Pell Grant and can be considered for Federal Work-Study, Federal Perkins Loan and Federal Supplemental Educational Opportunity Grant (FSEOG). If the student is applying for Federal Direct Loans, the student must complete both the FAFSA and the Direct Loan Processing Form. The college code for City Tech is 002696. If a student does not wish to file online, the student 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. It will take approximately 4 to 6 weeks to be processed.

The second financial aid application is for the New York State Tuition Assistance Program (TAP). The student can apply for TAP through the link for New York State residents on the FAFSA on the web Submission Confirmation Page. The student will be asked to establish a PIN for TAP. The TAP PIN will allow the student to apply for TAP, keep track of application information, and make changes. The TAP college code for City Tech is 1405. By filing the TAP application, the student will be considered for New York State financial assistance programs (TAP, Aid for Part-time Study {APTS}, and Part-time TAP). Even if the student uses a paper FAFSA to apply for federal aid, the student may still choose to complete the TAP application on the web at www.tapweb.org. Approximately 3 weeks after submitting the FAFSA, the student will be notified by postal mail or email to go to www.tapweb.org to establish a PIN, and complete the TAP application online. If the student chooses not to apply online, the student will receive an Express TAP Application (ETA) in the mail. The third application is the CUNY Supplement Form. The student will be notified to log into the CUNY Portal to complete the CUNY Financial Aid Supplement online. It is used primarily to calculate Aid for Part-time Study (APTS).

When the FAFSA is processed, the student will receive a Student Aid Report (SAR) from the U.S. Department of Education either online (using the PIN) or by mail. The SAR displays the information submitted on the FAFSA and has the student's Expected Family Contribution (EFC). See the section on "Financial Need and Expected Family Contribution (EFC)" below. The student should review the SAR and either make corrections online or come to the financial aid office with the supporting documentation to make changes. The student will also receive an email from the New York State Higher Education Services Corporation regarding his/her eligibility for TAP and an award letter will be sent to the part-time student acknowledging eligibility for APTS. Finally, students who requested additional aid will receive an award letter indicating their awards for the year.

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, or 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 to make adjustments that more closely reflect the current circumstance. The student must complete the FAFSA first, using the income for the year as requested on the application.

Applying for Aid Is an Annual Process

Students must file for financial aid annually starting January 1st for the upcoming academic year (summer, fall and spring terms). Students are encouraged to file their financial aid applications by March 31st.

For questions, students should contact the Financial Aid Office, located in Namm Hall, room N/G-13. During the academic year, the office is open on Monday, Wednesday and Thursday from 9:30 am to 6:30 pm, Tuesday from 9:30 am to 4:30 pm and Friday from 9:30 am to 3:00 pm. 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. The student can call 718.260.5700 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). When the student applies for federal student aid, the information reported on the FAFSA is used in a formula established by the U.S. Congress that calculates the student's 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, the student will be eligible for a Federal Pell Grant. For the 2012-2013 Academic Year, the Federal Pell Grant is only awarded if the EFC is 4995 or less.

The EFC is used to determine the student's financial need. When CUNY receives the 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 the parents 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 Federal Perkins loan. For the 2012-2013 Academic Year, FSEOG is awarded only if the EFC is 1000 or less; FWS is only awarded if the EFC is 1300 or less; and the Federal Perkins loan is only awarded if the EFC is 1500 or less; and the student is in his/her second year of college.

SAR Submission Policy

The student's correct and complete FAFSA information (SAR) must be processed by the U.S. Department of Education and received by the school before the student's last day of enrollment to be eligible for federal financial aid. If the 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 from the student's last day of attendance.

The Cost of Attendance (Student's Budget)

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

Below is the 2012-2013 Academic Year Budget for full-time undergraduate students:

	Living with parent	Living away from parent
Tuition	\$5,430.00	\$5,430.00
Fees	\$339.10	\$339.10
Books and Supplies	\$1,248.00	\$1,248.00
Transportation	\$986.00	\$986.00
Lunch	\$1,105.00	\$1,105.00
Room and Board	\$1,685.00	\$8,820.00
Personal	\$1,780.00	\$3,954.00
Total	\$12,573.10	\$21,882.10

Student Resources

Students should consider the resources that they will have from earnings and savings, the amount the 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. Some students qualify for an early partial disbursement of the Pell Grant in the form of a book advance payment. The book advance is created from the federal Pell award that the student has available after tuition and fees are paid. The remaining balance of the Pell Grant is paid approximately six weeks after the first day of classes.

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 degree at the College. Contact the Admissions Office for further information.

Permit-Out Students and Financial Aid Payments

Student 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 transcript to the Financial Aid Office, Namm Hall, room G 13. A STOP will be placed on the students' records if they 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. Financial aid will not be paid by City Tech for classes taken at the other institution. If eligible, students will be paid financial aid by City Tech, only for the classes that are taken at City Tech.

Federal Student Eligibility

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

- demonstrate financial need, except for Direct unsubsidized and PLUS,
- have a high school diploma or equivalent, pass an approved ability-to-benefit test 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,
- must have resolved any drug conviction issue

The Higher Education Act of 1965 as amended (HEA) suspends aid eligibility for students who have 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, the student can regain eligibility if he passes two unannounced drug tests conducted by a drug rehabilitation program that complies with criteria established by the U.S. Department of Education.

A student subject to an involuntary civil commitment after completing a period of incarceration for a forcible or non-forcible sexual offense is ineligible to receive a Federal Pell grant.

Even if the student is ineligible for federal aid, the student should complete the FAFSA because the student may be eligible for nonfederal aid from states and private institutions. If the student regains eligibility during the award year, the student should notify his financial aid administrator immediately. If the student is convicted of a drug-related offense after he submits the FAFSA, he might lose eligibility for federal student aid, and might be liable for returning any financial aid he received during the period of ineligibility.

Federal Satisfactory Academic Progress Standards for Title IV programs

The Federal Satisfactory Academic Progress standard applies to students seeking assistance through all federal student financial aid programs available at New York City College of Technology. Students may receive federal student financial aid if they meet the College's retention standards and are making satisfactory progress toward their degree.

Retention Standards

Quantitative Measure

To remain eligible for federal financial aid at City Tech, the student is expected to maintain a minimum cumulative GPA based on the number of credits attempted as in the following table:

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

Only those credits used for calculating the cumulative GPA that are required to meet the College's minimum retention standard are used to assess whether a student meets the qualitative component of the federal satisfactory progress standard. The phrase "credits attempted" is defined differently when referring to the quantitative measure of progress. (See Determining Attempted Credits and Accumulated Credits below)

The regulations also stipulate that, if enrolled in an educational program of more than two academic years, a student must have a GPA of at least "C" or the equivalent at the end of the second academic year. This means that a student must maintain a minimum 2.0 GPA after being at the school for four semesters without regard to enrollment status and superseding the above table.

Quantitative Measure

Also, to remain eligibility, the student must attempt no more than 150% of the credits required for the degree. Remedial course-work is not considered in the calculation of the progress towards completion of the degree program in which the student is enrolled.

Satisfactory Academic Progress Standard

In order to be making satisfactory academic progress toward a degree, for purposes of receipt of Federal Title IV student financial assistance, an undergraduate student must meet the minimum standards specified below.

1. **Minimum GPA** – achieve at least the GPA required to meet the College's minimum retention standard, or successfully appeal to be placed on academic probation; if enrolled in a program of more than two years, achieve at least a "C" average, or its equivalent, at the end of the second academic year, or have an academic standing consistent with the requirements for graduation.
2. **Maximum Time-frame** – may not attempt more than 150% of the credits normally required for completion of the degree.
3. **Pace of Progression** – For baccalaureate programs, accumulated (or earned) credits must be equal to or greater than $[(.75 \times \text{cumulative credits attempted}) - 18]$; For associate degree programs, accumulated credits must be equal to or greater than $[(.875 \times \text{credits attempted}) - 21]$.

All undergraduate students (whether aid recipients or not) will be measured against each of the three satisfactory academic progress components at the end of the spring term to determine eligibility for receipt of Federal Title IV student financial assistance for the upcoming award year.

Determining Attempted Credits and Accumulated Credits

Attempted credits, as defined in this section, 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 the college 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 they will be 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 would be included in the 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, net of program adjustments, withdrawals as part of the program adjustment period (i.e., "drops") will not be included as cumulative attempted credits. Withdrawals which are recorded on a student's permanent record will be included as cumulative attempted credits and will have an adverse effect on a student's ability to meet the pace of progression standard.

NOTE: Retroactive "non-punitive" administrative withdrawal activity may result in the requirement for the student to repay any assistance received as a result of the student's enrollment at the time of receipt of the student assistance funds.

3. **Incomplete Grades** – Courses with incomplete grades are included as cumulative attempted credits. However, these courses cannot be used as credits accumulated toward the degree since successful completion is the criterion for positive credit accumulation. If the student fails to meet the pace of progression standard due to the lack of successful completion grades for incomplete courses, the recording of successful completion grades within a term which brings the accumulated credit level to the appropriate standard will restore 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, reduce a student's capacity to meet the pace of progression standard.

NOTE: the revised regulations allow students to receive Title IV aid for one-time repeat of a previously passed course as long as the student is again receiving credit for the course. Should the student subsequently fail the course, any additional attempt of that course cannot be included in the student's enrollment status for Title IV assistance. There is no regulatory limit on the number of times a student may be paid to retake a failed course, unless the student has also previously passed that course.

5. **Transfer of Credit** – When a student transfers to City Tech, his or her transfer credits are not measured against the federal academic standards to determine his/her eligibility for federal financial aid programs in the first semester of transfer. Transfer students from colleges inside and outside of CUNY shall 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 cumulative attempted credits and cumulative earned credits earned. For future semesters,

federal academic program standards for eligibility will be measured once a year, at the end of each spring semester. If a student completed a 4-year degree, he or she will not be eligible to receive a Federal Pell Grant or a Federal Supplemental Educational Opportunity Grant (FSEOG).

Financial Aid Suspension

Undergraduate students who do not meet the minimum undergraduate standard are placed on financial aid suspension and lose their eligibility to participate in federal student aid programs. Students on financial aid suspension will remain ineligible for Title IV federal student assistance until they take actions that once again bring them into compliance with the appropriate progress standard.

Right To Appeal

Students who have been placed on financial aid suspension may appeal to the Committee on Financial Aid Standing to regain his/her eligibility to receive federal student aid. The appeal form is available at the Office of the Executive Director of Student Affairs in the Namm Building, room N 322 and at the Financial Aid Office in the Namm Building, room NG 13. 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 student's appeal must include: a) the reasons why the student failed to make satisfactory academic progress and b) what has changed in his or her situation that will allow the student to demonstrate satisfactory academic progress at the next evaluation. The appeal may be granted if the school:

- determines that the student will be able to meet the appropriate satisfactory academic progress standard by the end of the next payment period (semester); OR
- develops an academic plan for the student that, if followed, will ensure that the student will either be able to meet the appropriate satisfactory academic progress standard by a specific point in time or achieve completion of his or her academic program.

The Committee on Financial Aid Standing can make an accurate academic assessment of the student's capability to meet the appropriate satisfactory academic progress standard by the next payment period/semester. If the committee determines that the student should be able to meet the satisfactory academic progress standards by the end of the next semester, the student may be placed on financial aid probation without an academic plan.

If the Committee determines that the student will require more than one payment period to meet satisfactory academic progress standards, it may develop an individual academic plan that outlines a detailed strategy for the student to regain satisfactory academic progress eligibility or attain program completion within a certain probationary time-frame. The plan can be for one payment period/semester or longer. The academic plan should specify conditions that must be met for the period covered by the appeal such as: the specific coursework that must be taken, the minimum GPA that must be attained, and the number of credits that must be successfully completed. An academic plan may take the student to program completion, rather than meeting the institution's satisfactory academic progress standards at a specific point in time.

Financial Aid Probation

A student who has been granted an appeal will be placed on financial aid probation for one semester to improve his/her academic record to meet the standard of satisfactory progress. Students in this status have their eligibility for Title IV program assistance reinstated for one payment period (semester). At the end of the probationary semester, the institution must review the student's academic progress to determine whether the student has met the appropriate satisfactory academic progress standard or has fulfilled the requirements specified in the student's academic plan. A student who once again meets the appropriate progress standard after the probationary semester will continue to receive Title IV assistance until the next scheduled progress evaluation. Students who meet all the conditions of their academic plan at the end of the probationary semester will continue to receive Title IV assistance on a monitored, semester by semester basis until the next scheduled progress evaluation.

There is no limit on the number of times a student may follow 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 college may approve or decline the subsequent appeal and may create an updated plan based on the information submitted.

Re-establishing Eligibility

Other than having eligibility restored through filing a successful appeal, a student on financial aid suspension may regain eligibility only by taking action that brings him or her into compliance with the appropriate progress standard. The mere passage of time is insufficient to restore Title IV eligibility to a student who has lost eligibility due to not meeting the satisfactory academic progress standard. Therefore, students may not re-establish eligibility solely by leaving the institution for at least one year because this action, by itself, would not bring the student into compliance for Title IV student academic progress standards.

Students who choose to remain enrolled without receiving Title IV aid may request a review of their academic record after any term in which they were on financial aid suspension to determine if they were able to re-attain the appropriate standard.

If a student is on financial aid suspension at the beginning of the academic year for not meeting one or more components of the school's satisfactory academic progress standard, but meets them at some point later in the academic year, the student may regain Title IV eligibility as follows:

Federal Pell Grant/Campus-based Funds

For Pell Grant and campus-based programs, the student regains eligibility at the beginning of the most recent payment period during which the student once again met the school's satisfactory academic progress standards, unless the school's satisfactory progress policy provides for reinstatement of eligibility at some later point.

Federal Direct Loan and FFEL Programs

For Federal Direct and FFEL program funds, the student regains eligibility for the entire period of enrollment. Again, this period generally coincides with the entire academic year, unless the school's satisfactory academic progress policy provides for reinstatement of eligibility at some later point.

Treatment of Non-Standard Situations

1. Readmitted Students – A student not making satisfactory academic progress cannot re-establish eligibility for Title IV program assistance by reenrolling after a one year or longer period of non-reenrollment. Upon readmission after any period of non-reenrollment, the student's Title IV progress standing must be reevaluated for student academic progress under the standard as the record stood at the end of his or her last term of attendance. If the student has taken any action during the period of non-reenrollment that would bring him or her into compliance with the progress standard (e.g., successfully completing transferable courses at another institution during the period of absence), this should also be factored into the reassessment. If the readmitted student has not taken any such action, or if the action taken is not sufficient to bring the student back into compliance with the progress standard, the student remains 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 shall 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. If a student completed a 4-year degree, he/she will not be eligible to receive a Federal Pell Grant or a Federal Supplemental Educational Opportunity Grant (FSEOG).

3. Change of Major – Students who change majors within the same degree or certificate program must complete the degree within the maximum time-frame, unless the institution has allowed for such changes by establishing various time-frames for different programs leading to the degree or by individually re-evaluating the time-frame for these students.

4. Change of Degree – If a student changes his or her objective and begins pursuing a different degree or certificate, the institution may make the student subject to the maximum time-frame it establishes for the new objective without regard to time spent pursuing the previous degree or certificate. The institution also has the flexibility to develop a policy that is more restrictive and limits the student to an overall time-frame for the completion of his or her studies.

Title IV Pace of Progression Charts

AA DEGREE MAXIMUM TIME-FRAME (60 CREDIT DEGREE X (1.5) = 90)

Credits Attempted

6 12 18 24 30 36 42 48 54 60 66 72 78 84 90

Required Credits Earned

0 0 2 4 6 13 19 23 27 33 39 44 49 55 61

BA DEGREE MAXIMUM TIME-FRAME (120 CREDIT DEGREE X (1.5) = 180)

Credits Attempted

15 30 45 60 75 90 105 120 135 150 165 180

Required Credits Earned

0 5 16 27 42 50 63 72 84 95 108 117

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 terms of full-time payments or its equivalent. Semesters are counted based on the portion of a full-time equivalent, so that a half-time equivalent is counted as half a semester toward the 12-semester limit. Students can track their remaining Pell Grant eligibility on www.nslds.ed.gov (National Student Loan Data System) or through their Student Aid Report.

Awards for the academic year will depend on program funding. For the 2012-13 Academic Year, awards range from \$301 to \$2,775 per semester. The Federal Pell Grant is based on a student's EFC, the cost of attendance, and the enrollment status (full-time, three-quarter time, half-time or less than half-time). To be eligible, a student must continue to make satisfactory academic progress and must not owe any repayment on federal Pell grants 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 or the CUNY Scholar Support Prepaid card or by direct deposit. Students should go to www.enroll.citiprepaid.com/cuny to enroll in the CUNY Support Prepaid card. Arrangements for direct deposit must be made at the Bursar's Office, Namm Hall, room N/G 06. Otherwise checks are mailed directly to the student.

To qualify for any federal financial aid payments, the student must actually begin attending classes. Before disbursing the Pell award, the student's enrollment status will be verified with the Registrar. The credits for any course that the student never attended (WN grade) are not counted in calculating the enrollment status, even though the student may still be charged for these courses.

Summer Pell awards can be 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 a student receives depends on the student's financial need, the amount of other aid received and the availability of funds. Students should apply early (January-March) in order to be considered for these limited funds. When funds are no longer available, no

more awards can be made for that academic year. 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 with an EFC of 1000 or less for the 2012-2013 Academic Year, and who have not earned a bachelor's or professional degree. As with other grants, an 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 only to students with an EFC of 1300 or less for the 2012-2013 Academic Year. The applicant must have a FWS award and must be enrolled at least half-time (6 real or equated credits). The Financial Aid Office arranges the jobs on campus 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 are helped in the selection of a job. 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. For the 2012-2013 Academic Year, the EFC must be 1500 or less and the student must be in his/her second year of college. The awards can range up to \$5,500 for each year of undergraduate study. A student's total debt cannot exceed \$27,500 for undergraduate study. The student must complete the FAFSA to apply. To qualify, the student must complete an "entrance interview" online at www.ecsi.net for each academic year for which they are receiving the Perkins loan. Generally, only continuing students with 28 or more cumulative credits with a minimum Grade Point Average (GPA) of 2.0 are awarded Perkins Loans.

The current interest rate of 5% is not charged while the student is enrolled for

at least half-time study. Once the student graduates, leaves the College, or ceases to be at least a half-time student, the student must complete an "exit interview" online at www.ecsi.net. Repayment begins nine months later, at which time interest will be charged, and the student will be responsible for repaying the principal and the interest that accrues during the period of repayment. The period of repayment may extend over a period of ten years or may be shorter or can be extended during periods of hardship. For example, a student can apply for a postponement or deferment of payment for a given period of time due to loss of a job. A student can also qualify for cancellation of all or part of the loan repayment for service in fields such as teaching, law enforcement and nursing. The student's obligation to repay may be partially or totally discharged in the event of death, total and permanent disability, school closures and bankruptcy.

If a student fails to make a scheduled payment when due or fails to apply for a postponement, deferment or cancellation in a timely manner, or does not comply with the terms and conditions of the loan, the College can declare the student's loan in default. When a student's loan goes into default, the student is not eligible for additional federal financial aid until the default is cleared and the loan is rehabilitated. A student 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 the unpaid balances of Direct Subsidized loans are based on the period of time when the loans were first disbursed.

Direct Subsidized loans disbursed on or after July 1, 2008 and before July 1, 2009, the rate is 6.0%.

Direct Subsidized loans disbursed on or after July 1, 2009 and before July 1, 2010, the rate is 5.6%

Direct Subsidized loans disbursed on or after July 1, 2010 and before July 1, 2011, the rate is 4.5 %.

Direct Subsidized loans disbursed on or after July 1, 2011 and before July 1, 2012, the rate is 3.4 %.

Direct Subsidized loans first disbursed on or after July 1, 2012 and before July 1, 2013, the rate is 3.4%.

Direct Unsubsidized loans disbursed on or after July 1, 2008, the rate is 6.8%.

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

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

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

The interest rate on PLUS first disbursed on July 1, 2009 is fixed at 7.9%. The interest rate may change annually on July 1st, but will never exceed 9%.

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. If the student qualifies for a Subsidized Loan, the federal government pays the interest on the loan while the student is in school and during the six-month grace period after a student graduates or falls 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 will not be eligible for subsidized interest benefits during the six-month grace period after a student graduates or falls below half-time enrollment. Interest will accrue during the grace period and will be 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, the student will have less to repay in the long run.
3. William D. Ford Federal Direct Parent Loan for Undergraduate Students (PLUS) Loan is a loan that parents of a dependent student can borrow to pay for the student's education.

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, a student must first file the FAFSA and resolve all problems relating to it. The student must also complete the "William D. Ford Federal Direct Loans Processing Form" for the appropriate academic year to request a loan. Additionally, all first time Direct Loan applicants or any student who has not completed a loan entrance counseling session online, must do so before the actual loan can be processed. If the student completed an online session for another college, then the student 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, the student should go to www.studentloans.gov

How to apply for Alternative Private Loans

The certification for Alternative Loans is handled in the following manner:

1. 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 degree-granting program of study for at least 6 credits or equated credits.
3. Students must first apply for loans through the William D. Ford Federal Direct Loan Program. If they are not eligible, they can continue the alternative loan process.
4. Loans cannot exceed the cost of education, less other types of aid.

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.

Once a Direct Loan is made, it is managed and collected by the U.S. Department of Education's Direct Loan Servicing Center. The toll-free telephone number is 800.848.0979.

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, the 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 student's 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 is adjusted each year on July 1. Parents will be notified of interest rate changes throughout the life of their loan(s). Interest is charged on the loan from the date of the first disbursement until the loan is paid in full.

Parents will pay a fee of up to 4 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.

Direct Consolidation Loans

A Direct Consolidation Loan is designed to help student borrowers to simplify loan repayment. Even though a student may have several different federal student loans, a student will need to make only one payment per month for all the loans the student may consolidate. The student 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 the student participate in an exit counseling session at www.nsls.ed.gov. This exit counseling

session is designed to provide the student with 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 student's loan goes into default. To get an idea of what the repayment schedule might be, the student can get customized estimates by using the online repayment calculators at Direct Loans on the web at www.studentloans.gov. The student can also go to the National Student Loan Data System website at www.nsls.ed.gov for information on all his or her U.S. Department of Education loans and grants.

When the Student Cannot Pay the Loan

When a student is having difficulty in repaying a loan, the student can apply for forbearance (a temporary suspension or reduction of payments), or a deferment (the student delays the repayment entirely). Deferments are granted when the student is enrolled at least half-time in an approved post-secondary program or graduate fellowship program, is in rehabilitation training, is unemployed (3-year limit), or is experiencing economic hardship (3-year limit). A Federal Student Loan Ombudsman Office is available for assistance with loan problems at 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 the student 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.
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, and must continue monthly payments to continue eligibility.

To find out more, the student can email defaulthelp@hesc.org or call 800.666.0991.

Loan Cancellation/ Forgiveness/Discharge

Under certain circumstances, a student loan, or a portion of the loan, may be cancelled, forgiven, or discharged in cases such as death, total or partial disability and false certification. The student can call 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 that the student earned when the 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 a student received less aid than the amount earned, the student may be eligible for a post withdrawal disbursement.

The portion of aid the student is entitled to receive is based on a percentage by comparing the total number of days in the semester to the number of days completed by the student before the withdrawal. For example, if the student completed 20% of the semester, the student would have earned 20% of the Title IV aid. And if the student already received 100% of the Title IV aid, the student would have to then return the unearned portion. The regulation further stipulates that the amount to be returned is to be shared by the College and the student in proportion to the aid that each possessed or received. The College's share of the excess funds is the lesser of the total amount of unearned aid; or institutional charges multiplied by the percentage of aid that was unearned.

The College's share is allocated to the Title IV programs as determined by statute. The student's share is the difference between the total unearned amount and

the College's share. This is also allocated to the Title IV programs, as determined by statute. 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 the overpayment on the student's behalf; therefore, the student will owe money to the college. An impound is placed on the student's account 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.

The amount of Title IV aid earned by the student is based on the number of days the student attended, divided by the total number of days in the semester, then multiplied by the total aid (grants and loans) awarded while the student was in attendance. A student who attended more than 60% of the semester is eligible for 100% of the federal aid awarded while in attendance. The College will contact the student within 30 days from the College's determination date to either offer a post-withdrawal disbursement or to notify the student of an overpayment.

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, including 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 a semester.

Aid for Part-time Study (APTS)

This award provides assistance to matriculated students who attend less than 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.

NYS Academic Progress Standard

Tuition Assistance Program (TAP) Eligibility Requirements:

- Good academic standing for undergraduates
- Effective with the 2010-11 academic year, 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.
- 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 General Building, room 414, 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.

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, a student 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 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 Degrees 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 Degrees 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.

Helena Rubinstein Foundation Scholarship:

Targeted to women in the following baccalaureate programs: applied mathematics, architectural technology, communication design, computer systems, electromechanical engineering technology, facilities management, career teacher education and technical teacher education, entertainment technology, telecommunication engineering technology.

Award: up to \$1000 per semester for related educational expenses.

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/admissions/scholarships/scholarships.shtml>

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

Jerry Berrol, Registrar
Namm Hall, room N/G 15
300 Jay Street
Brooklyn, New York 11201
Phone: 718.260.5800
email: jberrol@citytech.cuny.edu

New Student Center

Stephanie DeMarfio-Izzett, Director
Namm Hall, room N 104
300 Jay Street
Brooklyn, New York 11201
Phone: 718.260.5013
Website: www.citytech.cuny.edu/students/nsc/index.shtml

New Students

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

Continuing Students

- **Web-based Registration.** Continuing students who are proficient in at least two of the three skills areas required by CUNY and are not on academic probation may participate in e-SIMS (web-based registration). Early web-based registration begins in November for the spring semester and in April for the summer and fall semesters. Students who are not eligible for early web-based registration should consult with their academic advisor during the semester and register for courses on e-SIMS immediately after final grades are posted. There is an 18-credit limit during this period of web registration.
- **In-person Registration.** Students who do not register on the web will be mailed registration material and an appointment for late in-person registration. Students are encouraged to keep their registration appointment. In the event that students cannot come to registration on their assigned date and time, they may come at a later date and time. Students cannot register prior to their appointment date

and time. Some classes will already be filled by the time of 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

All students are encouraged to monitor progress toward graduation by viewing their individual ESP (Educational Student Planner) available on the CUNY Portal (www.cuny.edu). ESP is a City Tech student's "virtual advisor" and is available on the web 24/7. Students can easily access ESP from any web-enabled computer, on or off campus.

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 should log on to e-SIMS 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. There is an \$18 fee to add a course/section.

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.
3. Courses on permit must apply to your current major.

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.

Students are permitted to take no more than two courses at another institution to complete NYCCT degree requirements. 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 the CUNY Portal system. The CUNY Portal requires that students register on the CUNY Portal website at www.cuny.edu, in order to access The City University of New York's e-Permit system.

Students taking courses at another unit of 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

Grading Procedures

The following applies to both degree and non-degree students.

Any student record sent from a unit of the University 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" provided:

1. the student obtains from the registrar and completes the proper withdrawal form, and
2. the student consults with his/her major department academic advisor. The advisor will sign the withdrawal form to indicate that the student has consulted with the department. Before withdrawing, students should consult with the Financial Aid Office to determine what effect it may have on their financial aid.

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 minimal 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.

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 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 initiate the request by completing the appropriate appeal form available from the Office of the Registrar and submitting it to the registrar within six months from the first day of the semester following the one in which the grade was recorded. Appeals may not be initiated after this time period. For the spring semester and the summer session, the six-month period begins on the first day of the fall semester. For the fall semester, the six month period begins on the first day of spring semester.

The student must first make an effort to resolve the matter with the course instructor. If the issue cannot be resolved with the instructor, the student should file an official grade appeal form with the registrar.

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. 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 committee elected to resolve the matter. Both the student and instructor must provide all supporting documentation and may be asked to appear before the committee.

Once the committee is convened, a decision must be made within a maximum of three weeks. If the committee unanimously recommends that a grade change is in order, then that decision is binding. If not unanimous, then the original final grade remains unchanged.

Where financial aid may be affected as a result of the final grade appeal, all parties concerned should pursue this matter expeditiously.

This policy does not affect the "F/D" and "I" policies that are currently in place.

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) on e-SIMS.

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)
*WN	Unofficial Withdrawal (never attended- no academic penalty)
S	Satisfactory/Passing (used in developmental courses)
WA	Administrative Withdrawal (no penalty)
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.

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	Honor 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

A student may be absent without penalty for 10% of the number of scheduled class meetings during the semester as follows:

Class Meets	Allowable Absence
1 time/week	2 classes
2 times/week	3 classes
3 times/week	4 classes

Each department and program may specify in writing a different attendance policy for courses with laboratory, clinical or field work.

If the department does not have a written attendance policy concerning courses with laboratory, clinical or field work, the College policy shall govern.

It is the responsibility of the instructor to keep accurate records of every student's attendance and to inform each class orally and in writing of the applicable attendance policy during the first two weeks of class meetings each semester.

1. Excessive Absence

If a student's class absences exceed the limit established for a given course or component, the instructor will alert the student that a grade of "WU" may be assigned. If a student remains officially registered for a course and never attends that course, a final grade of "*WN" will be assigned.

If the student withdraws officially from the course, he/she will be assigned a grade in accordance with the existing withdrawal policy of the College.

2. Appeals

A student wishing to appeal the excessive absence status and the impending grade should request a meeting with the chairperson of the department in which the course is offered. The chairperson will consult with the instructor to render a decision. A student wishing to appeal a "WU" grade may do so through the Committee on Course and Standards.

3. Lateness

Each department will establish a policy regarding student lateness in its courses. Lateness policies are to be announced and distributed to the faculty by the department chairperson. It is the responsibility of the instructor to keep a record of lateness and to inform each class orally and in writing of the lateness policy during the first two weeks of class meetings of each semester.

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. obtain a Program Change form from the major department and have it signed by the chairperson;
4. have Program Change form approved by the Financial Aid Office; and
5. return Program Change form to the Office of the Registrar.

Students who must withdraw from a developmental or ESOL course, in addition to the above, 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 co-requisite, 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.

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 or are absent for more than 10% of the hours the course meets 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

Change of curriculum depends on 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 appropriate application with the registrar during the designated filing period. SEEK students must consult with their SEEK advisor before making changes in curriculum. Changes of curriculum for a current semester must be approved and submitted to the Office of the Registrar before the 20th calendar day of the semester. After this date, all curriculum changes will be applied to the following semester.

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.

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. If you want your transcript forwarded to a college or agency, you must file a transcript request form at the registrar's office. Include your social security number, curriculum, date of birth, dates of attendance, name while in attendance and whether or not you are a NYCCT graduate. There is a \$7.00 fee for each transcript. Transcripts forwarded to other units of The City University of New York will be sent without charge.

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, are not to 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 are they to 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.

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 described on page 94. It 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, described on page 95 and in computer science on page 98. 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. Requirements for each of these degrees are listed on the appropriate pages of this catalog. (see the chart on page 44).

Baccalaureate Degrees

The College offers three baccalaureate degrees: the bachelor of science, the bachelor of science in education and the bachelor of technology. The bachelor of science is offered in applied mathematics, health services administration, human services, nursing, and law and paralegal studies. The bachelor of science in education is offered in career and technical teacher education and technology teacher education. The bachelor of technology is offered in architectural technology, communication design, computer engineering technology, computer systems, entertainment technology, facilities management, graphic arts production management, hospitality management, and

telecommunications engineering technology. The requirements for each of these degrees may be found beginning on page 35. 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. Marta Effinger-Crichlow at 718.260.5254.

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, page 11, 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 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 dean of instruction.

The CUNY Proficiency Examination (CPE)

On November 22, 2010, the CUNY Board of Trustees voted to eliminate the CUNY Proficiency Examination (CPE) as a degree requirement for all previous, current, and future CUNY students.

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, page 28), 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, co-requisites (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 co-requisite must be taken concurrently with the course that requires it.
- Complete the core curriculum program (general education requirements) for the degree. The core curricula for the associate and the baccalaureate degrees are described on page 35. In some cases, your departmental requirements may narrow the choices available to satisfy the core curriculum program.

COMPUTER LITERACY REQUIREMENT

All candidates for graduation must be certified to be computer literate. Candidates for the associate in arts, associate in applied science, associate in science, bachelor of technology or bachelor of science degree can demonstrate computer literacy by completing computer-related courses offered or required by their major department or by passing a self-paced qualifying examination given in the Atrium Learning Center.

GENERAL EDUCATION/ CORE CURRICULUM

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 attitudes, 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. Courses in the core curriculum address each of the following:

- Communication Skills: the ability to read, write and speak effectively.

- **Critical Thinking:** the ability to analyze complex issues and to evaluate information.
- **Research and Computer Skills:** the ability to acquire, evaluate and synthesize information using appropriate technology in an ethical and legal manner.
- **Scientific Literacy:** an understanding of the scientific method and the contribution of science to human progress.
- **Mathematical Literacy:** the ability to state and analyze a problem in the language of mathematics and to form a clear, well-justified conclusion.
- **Humanistic and Social Inquiry:** an understanding of and respect for cultural diversity, the human experience and the interconnectedness of global and local concerns

These essential competencies are introduced in the core curriculum requirements for an associate degree and deepened in the baccalaureate core curriculum. The charts below show the courses a student must complete at each level, associate and baccalaureate.

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 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 an additional two writing-intensive courses for the baccalaureate degree, one in the baccalaureate core plus one in an 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 have a "W" appended to the section number in the schedule of classes. 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.

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.

TABLE 1
THE ASSOCIATE DEGREE CORE*

Credits	Subject Area ¹	Abbreviated as ²
3 credits	English Composition: ENG 1101	ENG
4 credits	Mathematics: MAT 1180 or higher (according to program)	MATH I
4 credits	Laboratory Science: BIO, CHEM, PHYS	SCI I
3 credits	One course in either Literature, Aesthetics or Philosophy Literature: any ENG, AFR 2200 series; PRS 2200 series or Aesthetics: any ARTH 1100 series, MUS series, AFR 1300, 2300 series, THE or Philosophy: any PHIL 2000 series, AFR 2600 series	LAP LIT AES PHIL
3 credits	One course in either Behavioral or Social Science Behavioral Science: any ANTH, PSY, SOC, AFR, PRS 1500 series or Social Science: HIS, AFR, PRS 1460 series, ECON 1101, 1401, GEOG, GOV	BS/SS BS SS
3 credits	Communications: ENG 1100 series ³ , LIB 1201, SPE (Speech), ESOL 1300 ⁴	COMM
Total: 20 credits		

TABLE 2
THE BACCALAUREATE DEGREE CORE*

Credits	Subject Area ¹	Abbreviated as ²
3 credits	English Composition: ENG 1101	ENG 1101
7/8 credits	Mathematics: MAT 1180 or higher One year sequence is required according to program.	MATH I MATH II
8 credit	Laboratory Science: BIO, CHEM PHYS One year sequence of a laboratory science series is required.	SCI I SCI II
3 credits	Literature: any ENG 2000/3400 series, AFR 2200, PRS 2200 series	LIT
6 credits	Two additional courses from two of the three LAP categories: Literature: any ENG 2000/3400 series, AFR, PRS 2200 series or Aesthetics: any ARTH, MUS, THE, AFR 1300/2300 series or Philosophy: any PHIL 2000 series or higher, AFR 2600 series	LAP LIT AES PHIL
9 credits	One year sequence in either BS or SS and one additional course Behavioral Science: any ANTH, PSY, SOC, AFR, PRS 1500 series Social Science: AFR 1400, 2400 series, any ECON 1101 or higher, GEOG, GOV, any HIS, PRS 1460 series One year sequence is an introductory course and an advanced course that has the introductory course as its prerequisite Examples: PSY 1101 and PSY 2402, ECON 1101 and ECON 2301 SOC 1101 and PRS 2501, AFR 1461 and HIS 3402	BS/SS BS SS
6 credits	One course is required from ENG, LIB or SPE according to program Communications: ENG 11003, ENG 3770 series, LIB 1201, SPE (Speech) Examples: ENG 1133 and SPE 1330, ENG 1121 and SPE 1340	COMM
Total: 42-43 credits		

* See course code conversion chart page 281.

¹ Course abbreviation and a number represent the courses in that series; for example, PHIL 2101 = a Philosophy course in the 2100 series.

² Abbreviation appears on the statement of requirements for majors in this catalog and on ESP (electronic student planner), an online student advisement tool.

³ ENG 1101 is not part of the COMM core.

⁴ ESOL students only

TABLE 3
CORE COURSES BY CATEGORY*

Course Number/ Category	Course Title	Credits	Prerequisite (Pre) or Co-requisite (Co) Where Specified
	ENGLISH COMPOSITION Abbreviation: ENG 1101		
ENG 1101	English Composition I	3	R/W Proficiency
	MATHEMATICS Abbreviation: MATH I, MATH II (See program requirement for approved course(s))		
MAT 1180	Math Concepts and Applications	4	M/R Proficiency
MAT 1272	Statistics	3	MAT 1180 or higher
MAT 1275	College Algebra and Trigonometry	4	MAT 1175
MAT 1280	Quantitative Math	4	MAT 1180
MAT 1372	Probability and Statistics	3	MAT 1275
MAT 1375	Precalculus	4	MAT 1275
MAT 1475	Calculus I	4	MAT 1375
MAT 1575	Calculus II	4	MAT 1475
MAT 2440	Discrete Structures and Algorithms I	3	MAT 1375, CST 2403
MAT 2580	Introduction to Linear Algebra	3	MAT 1575 - Pre or Co
MAT 2630	Numerical Methods	3	MAT 2580, CST 1101
MAT 2675	Calculus III	4	MAT 1575
MAT 2680	Differential Equations	3	MAT 1575
	LABORATORY SCIENCE Abbreviation: SCI I, SCI II		
BIO 1101	Biology I	4	R Proficiency
BIO 1201	Biology II	4	BIO 1101
BIO 1501	Elements of Human Biology	4	R Proficiency or ENG 092R - Co
BIO 2311	Anatomy and Physiology I	4	BIO 1101 or equivalent and R/W Proficiency
BIO 2312	Anatomy and Physiology II	4	BIO 2311
BIO 3302	Microbiology I	4	BIO 2311 or BIO 1101
BIO 3350	Elements of Bioinformatics	4	MAT 1275, BIO 1101 and R/W Proficiency
CHEM 1110	Chemistry I	4	MAT 1275 and ENG 092R
CHEM 1210	Chemistry II	4	CHEM 1110
PHYS 1111	Principles of Science I	4	R/W Proficiency and MAT 1175 - Co
PHYS 1112	Principles of Science II	4	PHYS 1111
PHYS 1117	Astronomy I	4	R/W Proficiency and MAT 1175 - Pre or Co
PHYS 1118	Astronomy II	4	PHYS 1117
PHYS 1433	Physics 1.2	4	MAT 1275 - Co
PHYS 1434	Physics 2.2	4	PHYS 1433
PHYS 1441	Physics 1.3	5	MAT 1475 - Co
PHYS 1442	Physics 2.3	5	PHYS 1441
	LITERATURE/AESTHETICS/PHILOSOPHY Abbreviation: LAP		
	LITERATURE Abbreviation: LIT		
AFR 2201	Black Writers in American Literature I	3	ENG 1101
AFR 2202	Black Writers in American Literature II	3	ENG 1101
AFR 2211	African Literature I	3	ENG 1101
AFR 2212	African Literature II	3	ENG 1101
AFR 2221	Black Literary Concepts	3	ENG 1101
AFR 2222	Current Caribbean Literature	3	ENG 1101
AFR 2250	Black Women In Literature	3	ENG 1101
ENG 2000	Perspectives in Literature	3	ENG 1101
ENG 2001	Introduction to Literature I: Fiction	3	ENG 1101
ENG 2002	Introduction to Literature II: Drama	3	ENG 1101
ENG 2003	Introduction to Literature III: Poetry	3	ENG 1101

CORE COURSES BY CATEGORY* *continued*

Course Number/ Category	Course Title	Credits	Prerequisite (Pre) or Co-requisite (Co) Where Specified
ENG 2100	English Literature I	3	ENG 1101
ENG 2101	English Literature II	3	ENG 1101
ENG 2150	Introduction to Women Writers	3	ENG 1101
ENG 2200	American Literature I	3	ENG 1101
ENG 2201	American Literature II	3	ENG 1101
ENG 2225	Asian American Literature and Culture	3	ENG 1101
ENG 2300	Great Works I	3	ENG 1101
ENG 2301	Great Works II	3	ENG 1101
ENG 3401	Law Through Literature	3	ENG 1101
ENG 3402	Topics in Literature	3	ENG 1121 or any previous LIT
ENG 3403	One Major Writer	3	ENG 1121 or any previous LIT
ENG 3404	Literature of Illness and Care	3	ENG 1121 or any previous LIT
PRS 2202	Latin American Literature	3	ENG 1101
PRS 2211	Puerto Rican Literature	3	ENG 1101
	AESTHETICS Abbreviation: AES		
	ART HISTORY COURSES		
AFR 1301	Introduction to Art of Africa	3	R/W Proficiency
AFR 1304	African American/Caribbean Art	3	R/W Proficiency
AFR 2302	Art and Architecture of Africa	3	ENG 1101
ARTH 1100	History and Appreciation of Photography	3	R/W Proficiency
ARTH 1101	History of Art, Pre/Gothic	3	R/W Proficiency
ARTH 1102	History of Art, Ren/Modern	3	R/W Proficiency
ARTH 1103	Survey of Art History	3	R/W Proficiency
ARTH 1104	Art of U.S.	3	R/W Proficiency
ARTH 1106	Modern Art	3	R/W Proficiency
ARTH 1108	Art of Asia	3	R/W Proficiency
ARTH 1110	Islamic Art	3	R/W Proficiency
ARTH 2401	Italian Renaissance Art and Architecture	3	ENG 1101 and ARTH/HU1 or ARCH 1121
ARTH 3311	The History of Graphic Design	3	ENG 1121
	MUSIC THEORY AND APPRECIATION COURSES		
AFR 1311	African-American/Caribbean Music	3	R/W Proficiency
MUS 1201	Musical Concepts	3	R/W Proficiency
MUS 1202	Fundamentals of Musicianship	3	R/W Proficiency
MUS 1210	Musical Styles	3	R/W Proficiency
MUS 1211	Music of Latin America	3	R/W Proficiency
MUS 1211	Credit will not be given for both HU 211 and PR 311		
MUS 2206	Jazz	3	ENG 1101
MUS 2207	20th Century Music	3	ENG 1101
	THEATER THEORY AND APPRECIATION COURSES		
AFR 1321	Black Theatre	3	R/W Proficiency
THE 1280	History of Physical Theater	3	R/W Proficiency
THE 2180	Introduction to Theater	3	ENG 1101
THE 2380	Play Analysis and Aesthetics	3	ENG 1101
	PHILOSOPHY Abbreviation: PHIL		
AFR 2612	Africana Philosophy and Religion	3	ENG 1101
PHIL 2101	Introduction to Philosophy	3	ENG 1101
PHIL 2102	Logical Thinking	3	ENG 1101
PHIL 2103	Ethics	3	ENG 1101
PHIL 2203	Health Care Ethics	3	ENG 1101
PHIL 2104	Ancient Philosophy	3	ENG 1101

CORE COURSES BY CATEGORY* *continued*

Course Number/ Category	Course Title	Credits	Prerequisite (Pre) or Co-requisite (Co) Where Specified
PHIL 2105	Modern Philosophy	3	ENG 1101
PHIL 2106	Philosophy of Technology	3	ENG 1101
PHIL 2107	Philosophy and Women	3	ENG 1101
PHIL 2120	Philosophy of Art and Beauty	3	ENG 1101
PHIL 2121	Chinese Philosophy	3	ENG 1101
PHIL 3208	Political Philosophy	3	Previous Philosophy
PHIL 3209	Philosophy of Religion	3	Previous Philosophy
PHIL 3210	Existentialism and Contemporary Life	3	Previous Philosophy
PHIL 3211	Philosophy of Law	3	Previous Philosophy
PHIL 3400	Environmental Philosophy	3	Previous Philosophy
BEHAVIORAL SCIENCE/SOCIAL SCIENCE Abbreviation: BS/SS			
Behavioral Science courses (BS)			
ANTHROPOLOGY COURSES			
ANTH 1101	Introduction to Anthropology	3	R/W Proficiency
ANTH 1102	Comparative Religions	3	R/W Proficiency
ANTH 1103	Contemporary Women	3	R/W Proficiency
PSYCHOLOGY COURSES			
PSY 1101	Introduction to Psychology	3	R/W Proficiency
PSY 2300	Developmental Psychology	3	PSY 1101
PSY 2301	Child Psychology	3	PSY 1101
PSY 2302	Adolescence and Adulthood	3	PSY 1101
PSY 2303	Psychology of Aging	3	PSY 1101
PSY 2401	Social Psychology	3	PSY 1101
PSY 2402	Psychology of Personality	3	PSY 1101
PSY 2403	Abnormal Psychology	3	PSY 1101
PSY 2404	Personnel and Organizational Psychology	3	PSY 1101
PSY 2501	Child and Adolescent Development	3	PSY 1101
PSY 2502	Human Learning and Instruction	3	PSY 1101
PSY 3407	Psychology of Visual Perception	3	PSY 1101, ENG 1101
SOCIOLOGY COURSES			
AFR 1501	Current Community Problems	3	R/W Proficiency
AFR 1502	Sociology of Urban Poverty	3	R/W Proficiency
PRS 1503	Puerto Rican/Latin American Child in Urban Setting	3	R/W Proficiency
PRS 2501	Puerto Rican/Latin American in NY and Urban America	3	SOC 1101
SOC 1101	Elements of Sociology	3	R/W Proficiency
SOC 1102	Urban Sociology	3	R/W Proficiency
SOC 1103	The Family	3	R/W Proficiency
SOC 1104	Race and Ethnic Relations	3	R/W Proficiency
SOC 2201	Sociology of Aging	3	SOC 1101
SOC 2401	Society, Technology and Self	3	SOC 1101
SOC 2403	Law and Society	3	SOC 1101 or PSY1101
SOC 3301	The Emerging Global Society	3	Previous SOC, or ECON 1101 HIS 1102 and ENG 1101
SOC 3402	The Sociology of Social Problems	3	SOC 1101 and ENG 1101
Social Sciences courses (SS)			
ECONOMICS COURSES			
ECON 1101	Macroeconomics	3	R/W Proficiency
ECON 1401	Microeconomics	3	R/W Proficiency
ECON 2301	Money and Banking	3	ECON 1101
ECON 2403	Labor Management Relations	3	ECON 1101

CORE COURSES BY CATEGORY* *continued*

Course Number/ Category	Course Title	Credits	Prerequisite (Pre) or Co-requisite (Co) Where Specified
GEOGRAPHY COURSES			
AFR 1410	Geography of Africa and the Diaspora	3	R/W Proficiency
GEOG 1101	Elements of Geography	3	R/W Proficiency
GOVERNMENT COURSES			
AFR 1401	African Governments	3	R/W Proficiency
AFR 2402	Heritage of Imperialism	3	ENG 1010
GOV 1101	American Government	3	R/W Proficiency
GOV 1102	State and Local Government	3	R/W Proficiency
GOV 2401	Constitutional Law	3	Previous GOV or LAW 1201
HISTORY COURSES			
AFR 1460	African History I	3	R/W Proficiency
AFR 1461	African History II	3	R/W Proficiency
AFR 1462	Blacks in Science, Technology and Business	3	R/W Proficiency
AFR 1465	African-American History I	3	R/W Proficiency
AFR 1466	African-American History II	3	R/W Proficiency
AFR 1467	Afro-Caribbean History	3	R/W Proficiency
HIS 1101	Western Civilization I	3	R/W Proficiency
HIS 1102	Western Civilization II	3	R/W Proficiency
HIS 1103	Western Civilization III	3	R/W Proficiency
HIS 1110	History of U.S. I	3	R/W Proficiency
HIS 1111	History of U.S. II	3	R/W Proficiency
HIS 1201	Contemporary Civilizations and Cultures of Asia	3	R/W Proficiency
HIS 1203	English History Survey	3	R/W Proficiency
HIS 1205	Economic History of the U.S.	3	R/W Proficiency
HIS 1208	History of Immigration, Ethnicity and Nativism in the U.S.	3	R/W Proficiency
HIS 3209	History of Technology	3	ENG 1101
HIS 3402	Topics in 20th Century World History 1945-2000	3	ENG 1101 and one of the following: HIS 1102, HIS 1111, AFR 1461 or PRS 1461
PRS 1461	Latin American History	3	R/W Proficiency
PRS 1462	History of Puerto Rico	3	R/W Proficiency
STS 3401	Science, Technology and Society	3	Completion of Associate core or dept. approval
COMMUNICATIONS Abbreviation: COMM			
WRITING COURSES			
ENG 1121	English Composition II	3	ENG 1101
ENG 1133	Specialized Communications for Technology Students	3	ENG 1101
ENG 1141	Creative Writing	3	ENG 1101
ENG 1161	Language and Thought	3	ENG 1101
ENG 1773	Weird Science: Interpreting and Redefining Humanity	3	ENG 1101 and computer competency necessary to take an on-line course
ENG 3771	Advanced Career Writing	3	ENG 1121 or ENG 1133
ENG 3773	Advanced Technical Writing	3	ENG 1121 or ENG 1133 and MST 1101 or equivalent
SPEECH COURSES			
ESOL 1300	Oral Communication Skills for English Language Learners	3	R Proficiency; CUNY ACT writing score of 4 or higher
SPE 1320	Voice and Diction	3	R Proficiency; placement test for non-native speakers
SPE 1330	Effective Speaking	3	R/W Proficiency
SPE 1335	Group Discussion	3	R/W Proficiency
SPE 1340	Oral Interpretation of Literature	3	R/W Proficiency
SPE 2401	International Communication	3	ENG 1101
SPE 3401	Communication for Business, Industry and Professions	3	ENG 1121 or higher; Previous SPE and CST 1101 or MST 1101
LIBRARY COURSE			
LIB 1201	Research and Documentation in the Information Age	3	ENG 1101

* See course code conversion chart page 281.

Academic Standards, Policies and Procedures

ACADEMIC STANDARDS POLICY

Standards for the Completion of Remedial and ESOL courses:

The timely completion of remedial and 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 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 English as a Second Language (ESOL) students who are not otherwise remedial to enter baccalaureate programs. Such students would have:
 - a. studied in a high school in which the language of instruction was not English and
 - b. 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

1. 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.
2. Students who meet the College's minimum CUM GPA standard at the end of the academic alert semester will be removed from academic alert.
3. 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

1. 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.
2. 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.
3. 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.
4. 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.

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. 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. 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

Students in technology career programs who attain a 3.20 average or higher will be invited to join Sigma Epsilon Tau, the honor society of engineering technologists.

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 website at <http://www.citytech.cuny.edu/students/registrar/forms.shtml> 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.

** 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 IS 9010 and 90 credits prior to a second IS 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 at <http://tipps.cuny.edu>.

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)

Some departments grant credit or advanced placement to students who have taken college-level courses in secondary school and passed the examination with a grade of 3 or better. Check with the relevant department or with the Office of the Registrar for current 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) and 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	DEPT	PAGE
5002	Accounting	AAS	BU	113
5317	Air Conditioning Equipment Technician	Cert	EC	242
5506	Alcohol and Substance Abuse	Cert	HS	141
1703	Applied Mathematics	BS	MA	99
5304	Architectural Technology	AAS	AR	188
0299	Architectural Technology	BTech	AR	190
5012	Art and Advertising Design	AAS	AD	174
0499	Bioinformatics	BS	BIO	82
5317	Building/Housing Superintendent Technology	Cert	EC	243
0839	Career and Technical Teacher Education	BS in Ed	CTTE	118
5305	Chemical Technology	AS	CH	83
5309	Civil Engineering Technology	AAS	CV	209
0601	Communication Design	BTech	AD	175
0925	Computer Engineering Technology	BTech	CET	196
5101	Computer Information Systems	AAS	CST	202
5101	Computer Science	AS	MA	98
0702	Computer Systems	BTech	CST	203
5317	Construction Management Technology	AAS	CT	209

LISTING OF ACADEMIC PROGRAMS *continued*

HEGIS CODE	DEGREE PROGRAM	DEGREE	DEPT	PAGE
5317	Construction Management	Cert	CT	211
5203	Dental Hygiene	AAS	DH	125
5204	Dental Laboratory Technology	AAS	RD	165
5012	Desktop Publishing	Cert	AD	179
5310	Electrical Engineering Technology	AAS	ET	216
5311	Electromechanical Engineering Technology	AAS	CET	195
1099	Emerging Media Technologies	BTech	ENT	229
1007	Entertainment Technology	BTech	ENT	228
5317	Environmental Control Technology	AAS	EC	239
0511	Facilities Management	BTech	EC	240
5004	Fashion Marketing	AAS	BU	115
5009	Graphic Arts Advertising Production Management	AAS	AD	177
0599	Graphic Arts Production Management	BTech	AS	178
1202	Health Services Administration	BS	HAB	128
5317	Heating Equipment Technician	Cert	EC	243
5010	Hospitality Management	AAS	HM	131
0508	Hospitality Management	BTech	HM	133
5501	Human Services	AAS	HS	137
2101	Human Services	BS	HS	139
5303	Industrial Design Technology	AAS	MT	249
5008	Interactive Media Technologies	Cert	ENT	233
5099	Legal Assistant Studies	AAS	LS	145
0599	Legal Assistant Studies	BS	LS	146
5649	Liberal Arts and Sciences	AA	LAS	94
5649	Liberal Arts and Sciences	AS	LAS	95
5399	Lighting Systems Technology	Cert	ENT	232
5004	Marketing Management and Sales	AAS	BU	114
0833	Mathematics Education	BS	MAT	105
5315	Mechanical Engineering Technology	AAS	MT	248
0925	Mechanical Engineering Technology	BTech	MT	264
5208.1	Nursing	AAS	NU	151
1203	Nursing	BS	NU	155
0839	Technology Teacher Education	BS in Ed	CTTE	120
0899.5	Technology Teacher Education Transitional C	Cert	CTTE	122
5212	Ophthalmic Dispensing	AAS	VCT	168
5207	Radiologic Technology and Medical Imaging	AAS	RT	161
1225	Radiologic Technology and Medical Imaging	BS	RT	166
5399	Scenic Construction	Cert	ENT	232
5399	Show Control	Cert	ENT	232
5399	Sound Systems Technology	Cert	ENT	232
5317	Sustainable Technology	Cert	STD	172, 191, 213, 242
5310	Telecommunications Engineering Technology	AAS	ET	218
0925	Telecommunications Engineering Technology	BTech	ET	219
0605	Video Production	Cert	ENT	233

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.

When students who were academically dismissed apply for admission to one of the baccalaureate programs of the College after successfully completing an associate degree elsewhere, they will be evaluated for admission on the basis of the work completed since their dismissal from the College. If admitted into one of the College's baccalaureate programs, the student's grade point average in that program will begin with their readmission, without the inclusion of their previous academic record at the College.

Academic Services and Special Programs

College Learning Centers

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

The College Learning Centers offer 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 principal site, the Atrium Learning Center located in the Atrium G-18, supplies tutors at specified hours for accounting, anatomy and physiology, biology, ESOL, chemistry, computer systems, math, physics, reading and writing. In addition, workshops are held for students who have been unsuccessful in completing upper-level developmental and ESOL courses.

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 and have that fact noted on their permanent record. This will satisfy the computer literacy requirement for graduation from the College.

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, and Internet access are also available on some stations.

Students may keep track of their growing accumulated skills using a comprehensive curriculum package, PLATO.

This software includes lessons, drills and tests in basic literacy skills, reading, writing, math, algebra and geometry. For the Mac stations, the Learning Center has a varied selection of graphics software supportive of the advertising design and graphic arts curricula. 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 and computer programs to review and reinforce coursework in the health curricula. Nursing students will benefit from NCLEX test-practice software.

The Tech Learning Center in Voorhees Hall, room V 217, is equipped with networked compatible workstations, CADD stations, electronic testing and drafting equipment, textbooks and audio-visual materials that focus on the needs of students enrolled in technology curricula. Microsoft Office, math programs, C++, PLATO and language arts software are available on the Learning Center network. 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.

Internet access is available on selected stations in both the Atrium and the Tech Learning Center sites for research related to coursework.

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

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. Charles Scott, Artistic Director
Voorhees Building, room V205
Phone: 718.260.5590
email: cscott@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 Advertising Design and Graphic Arts 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

Darrow Wood, Chair and 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 CUNY+ online catalog and find articles and other full-text content from our collection of databases and other e-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 CUNY+ online catalog, and to library collections across the country through regional partnerships and Interlibrary Loan.

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

The Ursula C. Schwerin Library is located on the fourth and fifth floors of the Atrium Building, with entry from the fourth floor. Library 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: csonnenblick@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 and girls in non-traditional technical education and occupations. AFW offers programs introducing girls and women to educational and career options in science, technology, engineering and mathematics (STEM). Activities focus on the need for early intervention for girls and career exploration for women and out-of-school youth. A range of experimental 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.

Nona Smith, Director
 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. As an approved "provider," the College is listed on the DOB's website and provides safety and OSHA courses for over 6,000 construction workers each year. Expanded offerings to meet new general industry and EPA guidelines were initiated in spring 2010. 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

Adult Learning Center

The Adult Learning Center (ALC) provides free classes to help students improve their English language, literacy and academic skills. Pre-GED and GED preparation courses, prepare adults for the high school equivalency diploma 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-GED or GED classes, to enter the CUNY Language Immersion Program or to apply to college. The ALC serves over 1000 adults each year.

Joan Manes, PhD, Director
Jacques Denis, MA, MPA, Program Manager
 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 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. A sampling of courses includes Conflict Resolution, Coping with Change and Financial Literacy.

Charles Johnston, Director
David Pedreira, Assistant Director
 For information call 718.552.1170

CUNY Language Immersion Program

The CUNY Language Immersion Program (CLIP) provides newly admitted CUNY students who are not native English

Collaborative Precollege Programs

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

Chuck Hoffman, Director
Shermira Busby, Assistant Director
For information call 718.552.1120

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 of CUNY and the NYC Department of Education designed to bridge secondary and post secondary education. City Tech recruits students from designated high schools for enrollment into this college transition program that offers a variety of preparatory and credit courses.

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)

Maralyn Mason, 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://bkl.eoc.suny.edu>

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:

- GED Preparation
- English as a Second Language
- College Preparation
- Medical Assisting

- Medical E-Records and Office Administration
- Hospitality Operations and Management
- Skills and Employment 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 GED Exam 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 offerings are featured on the Mayor's Office of Adult Education www.KnowBeforeYouEnroll.gov and www.nyc.gov/YouCanTooNYC sites
- BEOC is featured on the <http://nyccollegeline.org/resources> - Graduate NYC! College Readiness and Success

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.

Special Programs

The COPE Program (College Opportunity to Prepare for Employment)

Marling Sone, Director
General Building, room G 503
Phone: 718.269.5187
email: msone@citytech.cuny.edu

The College Opportunity to Prepare for Employment Program (COPE) provides a wide range of supportive services to the College's family-assistance and safety-net population. An integral aspect of COPE is to help students clarify their values and reach desired academic, career and personal development goals. The program assesses and completes all pertinent documentation to ensure that students meet the mandates set forth by the Human Resources Administration.

The SEEK Program

Dorie Clay, Director
Midway Building, room M 501
Phone: 718.260.5680
Website: www.citytech.cuny.edu/students/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 Student Support Services Program (Students with Disabilities and Learning Differences)

Linda Buist, Director
Atrium Building, room A 237
718.260.5143 (voice)
718.254.8539 (fax)
Website: <http://www.citytech.cuny.edu/students/supportservices/index.shtml>

The Student Support Services Program addresses the needs of self-identified college students with documented disabilities. Student Support helps students focus on developing their academic potential and foster their independence. Through self advocacy orientations, academic skills training, and computer assistive technology workshops, students are empowered to integrate more fully into the college community. After an intake appointment and assessment of student documentation, students who are registered with Student Support Services are entitled to receive reasonable accommodations to support their learning in the college. Services students may be entitled to include, but are not limited to, one on one tutoring, alternate format textbooks, American Sign Language interpreting, note taking, and access to various computer assistive technology for the enhancement of reading, writing, and creative design. Students may enroll with the program throughout the year.

Counseling and Student Services

Counseling Services Center

Cynthia Bink, Director
Namm Hall, room N 108
Phone: 718.260.5030
Website: www.citytech.cuny.edu/students/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 Services Center

Aries Jones, Coordinator
Namm Hall, room N 124
Phone: 718.260.5520

The Information Services Center is a central clearinghouse for information about College events, activities, services, policies and procedures. Staffed by professionals and student peer assistants, the center provides information and referrals to students, faculty, staff and visitors, and publishes the student handbook and student newsletter.

Students are encouraged to visit the center, located adjacent to the Namm cafeteria, for flyers, brochures and other College-related materials.

Questions addressed to connect@citytech.cuny.edu receive responses within two business days or less.

The New Student Center

Stephanie DeMarfio-Izzett, Director
Namm Hall, room N 104
Phone: 718.260.5013
Website: www.citytech.cuny.edu/students/nsc/index.shtml

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

Paul Dorestant
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.

Placement Office

Adrian Griffith, Director
Namm Hall, room N/G 08
Phone: 718.260.5050
Website: www.citytech.cuny.edu/placement

The Placement Office provides comprehensive employment opportunities, career development and placement services for students and graduates. The office develops and sustains relationships with employers in the private, public and non-profit sectors that promote job opportunities for students and graduates.

The following services are offered:
Computer-assisted résumé and cover-letter writing; one-on-one pre-employment

preparation and placement advisement sessions; special on-campus recruitment events; access to hundreds of regularly updated internships; part-time and full-time job listings; an annual job fair and employment readiness workshops. Online services include job search, résumé posting, email special event notification and access to employer research information. Emails can be sent to employmentsvc@citytech.cuny.edu

Student Wellness Center

Roxanna Melendez, Director
Pearl Building, room P 104
Phone: 718.260.5910

The Student Wellness Center offers an array of services including a full schedule of fitness classes for students of every fitness level; bi-weekly chair massage; health information and screenings; and referrals to community service providers. We also host campus-wide wellness related special events and activities. 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 office. Walk-in service is also available. There is no fee for services provided on site. Referrals are made for clinical services not provided at the center. We contract with Downtown Integrated Medical Services (DIMS) to provide both on- and off-site clinical medical services. Their multi-service medical facility is located at 81 Willoughby Street, 4th floor. To schedule an appointment with DIMS, call 718.522.3399.

Veteran Services Counseling

Jennifer Serrano
Certifying Officer
Registrar Office, Namm Hall, room N/G 15
Phone: 718.260.5656

Paul Schwartz, LCSW,
Counselor/Faculty Advisor
Namm Hall, room N 108
Phone: 718.260.5130

Brooklyn Veterans Center
(Community Resources)
25 Chapel Street, room 604
Brooklyn, NY 11201
Phone: 718.624.2765
(contacts are Michael Kim and Kevin O'Brian)

City Tech welcomes men and women who have served, or currently serve, in the United States armed forces. Working closely with the Brooklyn Veterans Center located at 25 Chapel street, room 604, telephone number 718.624.2765, new students are encouraged to first review their GI bill options with this community service center. The Brooklyn Veterans Center provides in depth information and assistance with VA educational benefits for veterans, reservists and eligible dependents. The Brooklyn Veterans Center has a long history of providing a community space dedicated to helping veterans adjust to civilian life. After meeting with the Brooklyn Veterans Center, students can submit all forms related to benefits to the College Certifying Officer, Jennifer Serrano in the Registrar's Office. Confidential, personal, academic and career counseling is also provided by Mr. Paul Schwartz, a professional counselor, sensitive to veterans issues and adept at helping with issues involving adjustment to college and civilian life.

Student Life and Development

Office of Student Life and Development

Daniel Fictum, Director
General Building, room G 516
Phone: 718.260.5391

The Office of Student Life and Development provides collaborative activities and learning experiences that support the personal, intellectual, professional, social and cultural development of students. Particular emphasis is given to leadership development for students through retreats and workshops. The office also works closely with the student government association and the 60 active clubs.

Athletics, Intramurals and Recreation

Brenda Alexander, Interim Director
Klitgord Center, room K 214
Phone: 718.260.5102
Website: www.citytech.cuny.edu/students/athletics

City Tech participates in NCAA athletics, affording students the opportunity to compete at the Division III level while maintaining rigorous academic standards. Students who have received an official admission notice are eligible to try out and practice before registration if they meet NCAA academic requirements. Proof of medical clearance is also necessary. NCAA eligibility requirements, City Tech's tryout schedule or other information can be obtained from the athletics office. Information on the athletics program can be found on the College website.

The College files an annual report with the U.S. Secretary of Education on intercollegiate athletics which includes information on the participation of males and females on its teams and the expenditures and revenues of those teams (EADA). Copies of this annual report are available at the reference desk of the Ursula Schwerin Memorial Library and on the College website at <http://www.citytech.cuny.edu/students/registrar/policies-stu.html>.

Intramurals

Club hours at City Tech are held on Thursdays from 12:45 pm to 2:15 pm. During this time a variety of competitive sports are offered including basketball, volleyball, paddleball and table tennis. Special events include the annual Turkey Trot and the fitness and weight-lifting competition. Intramural schedules are distributed and posted throughout the College. For further information come to the Klitgord Building, room K 214 or call 718.260.5102.

Recreation

The recreation program provides leisure-time activities for students, faculty and staff. Daily informal events include use of the gym, fitness center and recreation room. Special classes include aerobics, martial arts and dance. Schedules are posted throughout the College. For further information, come to the recreation office in the Klitgord Building, room K 214 or call 718.260.5102.

To participate in the intramural and recreation programs, you must obtain a gym activity sticker from the recreation office. In order to receive the sticker, you must show a validated City Tech ID card or an alumni card and sign a medical activity form. The card is required at all times for 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 is at their 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.

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 age, sex, sexual orientation, alienage or citizenship, religion, race, color, national or ethnic origin, handicap, veteran or marital status 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 Linda Buist, Manager, Office of Student Support Services, at lbuist@citytech.cuny.edu, Room A237 or 718.260.5143; or Gilen Chan, Esq., Title IX Coordinator, at gchan@citytech.cuny.edu, Room Namm 325 or 718.260.4981

Ms. Gilen Chan is NYCCT’s affirmative action officer and coordinator for Title IX and ADEA, which prohibit sex and age discrimination in federally assisted education programs, respectively.

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

POLICY ON ACCEPTABLE USE OF COMPUTER RESOURCES

Adopted January 29, 2007

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.

Applicability

This policy applies to all users of CUNY computer resources, whether affiliated with CUNY or not, and whether accessing those resources on a CUNY campus or remotely.

This policy supersedes the CUNY policy titled “CUNY Computer User Responsibilities” and any college policies that are inconsistent with this policy.

Definitions

“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, personal computers, handheld devices, workstations, mainframes, minicomputers, servers, network facilities, databases, memory, and associated peripherals and software, and the applications they support, such as email and access to the internet.

“Email” includes point-to-point messages, postings to newsgroups and listservs, and other electronic messages involving computers and computer networks.

Rules for Use of CUNY Computer Resources

1. **Authorization.** 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. This provision shall not prevent a user from authorizing 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 because of a disability. 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 taking ordinary security precautions.
2. **Purpose.** Use of CUNY computer resources is limited to activities relating to the performance by CUNY employees of their duties and responsibilities. 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. Except with respect to CUNY employees other than faculty, where a supervisor has prohibited it in writing, incidental personal use of 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.

3. Compliance with Law. 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.

Examples of applicable federal and state laws include the laws of libel, obscenity and child pornography, as well as the following:

- Family Educational Rights and Privacy Act
- Electronic Communications Privacy Act
- Computer Fraud and Abuse Act
- New York State Freedom of Information Law
- New York State Law with respect to the confidentiality of library records

Examples of applicable CUNY rules and policies include the following:

- Sexual Harassment Policy
- Policy on Maintenance of Public Order
- Web Site Privacy Policy
- Gramm-Leach-Bliley Information Security Program
- University Policy on Academic Integrity
- Information Security policies

4. Licenses and Intellectual Property. Users of CUNY computer resources 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. 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 of CUNY computer resources 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.

5. False Identity and Harassment. Users of CUNY computer resources may not employ a false identity, mask the identity of an account or computer, or use 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. Users of CUNY computer resources may not invade the privacy of others by, among other things, viewing, copying, modifying or destroying data or programs belonging to or containing personal or confidential information about others, without explicit permission to do so. CUNY employees must take precautions to protect the confidentiality of personal or confidential 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 computer resource, or which could reasonably be expected to cause, directly or indirectly, excessive strain 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 that they are not sure are safe.

8. Disruptive Activities. 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. This provision explicitly prohibits chain letters, virus hoaxes or other intentional email transmissions that disrupt normal email service. Also prohibited are 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, as well as the inclusion on email 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. CUNY has the right to require users of CUNY computer resources 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. 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.

10. Security. 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 private information, as well as for following CUNY's Information Security policies and procedures. Users must report incidents of Information Security policy non-compliance or other security incidents to CUNY's Chief Information Officer and Chief Information Security Officer, and the IT director at the affected user's college.

11. **Filtering.** CUNY reserves the right to install spam, virus 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. Notwithstanding the foregoing, CUNY will not install filters that restrict access to email, instant messaging, chat rooms or websites based solely on content.
12. **Confidential Research Information.** Principal investigators and others who use CUNY computer resources to store or transmit 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 confidential research information from unauthorized access or modification. In general, this means storing the information on a computer 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 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., 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.
13. **CUNY Access to Computer Resources.** CUNY does not routinely monitor, inspect, or disclose individual usage of its 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, email 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 contained in computer storage in any CUNY electronic device dedicated to their use will not be intruded upon by CUNY except as outlined in this policy. CUNY may specifically monitor or inspect the activity and accounts of individual users of CUNY computer resources, including individual login sessions, email 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 protect CUNY from liability, or when failure to act might result in significant bodily harm, significant property loss or damage, or loss of significant evidence, as determined by the College president or a vice president designated by the president, after consultation with the Office of General Counsel and the Chair of the University Faculty Senate (if a 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, after consultation with the Office of General Counsel and the Chair of the University Faculty Senate (if a 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, 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 CUNY faculty member's account or activity is involved) or Vice Chair if the Chair is unavailable; or
 - g) as otherwise required by law. 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:

- (i) the College president 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; and
- (ii) 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.

A CUNY employee may apply to the General Counsel for an exemption from some or all of the circumstances under which CUNY may inspect and monitor computer resource activity and accounts, pursuant to subparagraphs (a)-(f) above, with respect to a CUNY computer resource used solely for the collection, examination, analysis, transmission or storage of confidential research data. In considering such application, the General Counsel shall have the right to require the employee to affirm in writing that the computer resource will be used solely for the confidential research. Any application for exemption should be made prior to using the computer resource for the confidential research.

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.

In addition, users should be aware that CUNY may be required to disclose to the public under the New York State Freedom of Information Law communications made by means of CUNY computer resources in conjunction with University business.

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.

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.

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. Enforcement. 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.

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.

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.

15. 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.

16. Disclaimer. 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.

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.

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 should 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 Vice Chancellor for Legal Affairs, The City University of New York, 535 East 80th Street, New York, NY 10021
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 interest in the information: name, attendance dates (periods of enrollment), address, telephone number, date and place of birth, photograph, 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, previous school attended, 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/G17. 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.
- Dates of attendance and current status, including major field of study.
- If graduated, date of graduation, degree and major.

- Honors and awards received.
- Confirmation of birth date.
- Height and weight of athletes engaged in intercollegiate sports.

If a student does not wish the above information released, he or she must notify the registrar in writing prior to the close of business, no later than 20 days after the first day of classes.

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 Information Non-Disclosure form is available online at <http://www.citytech.cuny.edu/students/registrar/policies-stu.html>, under the heading FERPA.

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 18.260.4981 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 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 shall conduct a review of the experience of the colleges with these procedures, including consultation with administrators, faculty and students, and shall report 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 on page 30. 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 based on racial, ethnic, religious, sexual, political and economic differentiation. 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 in or in attendance at any college, school or unit under the control of the board and every student organization, association, publication, club or chapter shall obey the laws of the city, state and nation and the bylaws and resolutions of the board and the policies, regulations and orders of the College.

The faculty and student body at each college shall share equally the responsibility

and the power to establish, subject to the approval of the board, more detailed rules of conduct and regulation in conformity with the general requirement of this article.

This regulatory power is limited by the right of students to the freedoms of speech, press, assembly and petition as applied to others in the academic community and to citizens generally.

Section 15.2 Student Organizations

Any group of students may form an organization, association, club or chapter by filing with the duly elected student government organization of NYCCT or school at which they are enrolled or in attendance and with an office to be designated by the faculty of the College or school at which they are enrolled or in attendance: (1) the name and purpose of the organization, club or chapter, (2) the names and addresses of its president and secretary or other officers corresponding in function to president and secretary. However, no group, organization or student publication with a program against the religion, race, ethnic origin or identification or sex of a particular group shall receive support from any fees collected by the College or be permitted to organize or continue at any college or school. No organization, military or semi-military in character, not connected with established college or school courses, shall be permitted without the authorization of the faculty and the duly elected student government and the board.

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:

- a) 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.

- b) The power to delegate responsibility for the effective implementation of its regulatory functions hereunder to any officer or committee which it may appoint. Any aggrieved student or group whose charter or other authorization has been refused, suspended or revoked may appeal such adverse action by such office or committee of student government to the duly elected student government. On appeal an aggrieved student or group shall be entitled to a hearing following the due process procedures as set forth in section 15.3. Following such hearing the duly elected student government shall have the authority to set aside, decrease or confirm the adverse action.

Any person or organization affiliated with the College may file charges with the Office of the Dean of Students: alleging that a student publication has systematically attacked the religion, race, ethnic origin or sex of a particular group or has otherwise contravened the laws of the city, state or nation or any bylaw or resolution of the board or any policy, regulation or order of the College within a reasonable period of time after such occurrence. If the dean of students determines, after making such inquiries as he/she may deem appropriate, that the charges are substantial, he/she shall attempt to resolve the dispute, failing which he/she shall promptly submit the charges to the faculty-student disciplinary committee or for disposition in accordance with the due process procedures of section 15.3 hereof.

If the committee sustains the charges or any part thereof against the student publication, the committee shall be empowered to (1) reprimand the publication or (2) recommend to the appropriate funding bodies the withdrawal of budget funds. The funding body shall have the authority to implement fully, modify or overrule the recommendations.

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.

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 Student Disciplinary Procedures

- a) Any charge, accusation or allegation which is to be presented against a student and, which if proved, may subject a student to disciplinary action, must be submitted in writing in complete detail to the Office of the Dean of Students promptly by the individual organization or department making the charge.
- b) The chief student affairs officer or his or her designee will conduct a preliminary investigation in order to determine whether disciplinary charges should be proffered. The chief student affairs officer or his or her designee will advise the student of the charge(s) against him or her, consult with other parties who may be involved or who have information regarding the incident, and review other relevant evidence. Following this 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;
 - (ii) refer the matter to conciliation; or
 - (iii) proffer formal disciplinary charges.

Conciliation Conference:

- a) The conciliation conference shall be conducted by the counselor in the Office of the Dean of Students or a qualified staff or faculty member designated by the chief student affairs officer. The following procedures shall be in effect at this conference:
- b) An effort will be made to resolve the matter by mutual agreement.

c) If an agreement is reached, the counselor shall report his/her recommendation to the chief student affairs officer for approval and, if approved, the complainant shall be notified.

d) If no agreement is reached, or if the student fails to appear, the counselor shall refer the matter back to the chief student affairs officer who will proffer disciplinary charges.

The counselor is precluded from testifying in a college hearing regarding information received during the conciliation conference.

Notice of Hearing and Charges:

Notice of the charge(s) and of the time and place of the hearing shall be personally delivered or sent by the chief student affairs officer to the student at the address appearing on the records of the College, by registered or certified mail and by regular mail. The hearing shall be scheduled within a reasonable time following the incident or the conciliation conference. Notice of at least five business days shall be given to the student in advance of the hearing unless the student consents to an earlier hearing.

The notice shall contain the following:

A complete and itemized statement of the charge(s) being brought against the student including the rule, bylaw or regulation he/she is charged with violating, and the possible penalties for such violation.

A statement that the student has the following rights:

- to present his/her side of the story;
- to present witnesses and evidence on his/her behalf;
- to cross-examine witnesses presenting evidence against the student;
- to remain silent without assumption of guilt; and
- to be represented by legal counsel or an advisor at the student's expense.

A warning that anything the student says may be used against him/her at a non-college hearing.

Faculty-Student Disciplinary Committee Procedures

The following procedures shall apply at the hearing before the faculty student disciplinary committee:

The chairperson shall preside at the hearing. The chairperson shall inform the student of the charges, the hearing procedures and his or her rights.

After informing the student of the charges, the hearing procedures, and his or her rights, the chairperson shall ask the student charged to plead guilty or not guilty. If the student pleads guilty, the student shall be given an opportunity to explain his/her actions before the committee. If the student pleads not guilty, the College shall present its case. At the conclusion of the College's case, the student shall be given an opportunity to present his or her defense.

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 only rule on the sufficiency of the evidence and may exclude irrelevant, immaterial or unduly repetitive evidence. However, 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 all persons who are to appear as witnesses, except the accused student.

The college shall make a record of each fact-finding hearing by some means, such as a stenographic transcript, a tape recording or the equivalent. A disciplined student is entitled upon request to a copy of such a transcript, tape or equivalent without cost.

The student is entitled to a closed hearing but has the right to request an open public hearing. However, the chairperson has the right to hold a closed hearing when an open public hearing would adversely affect and be disruptive of the committee's normal operations.

The college bears the burden of proving the charge(s) by a preponderance of the evidence.

The role of the faculty-student disciplinary committee is to listen to the testimony, ask questions of the witnesses, review testimony and evidence presented at the hearing and the papers filed by the parties.

At the end of the fact-finding phase of the hearing, the student may introduce additional records, such as character references. The college may introduce a copy of the student's previous disciplinary record, where applicable, provided the student was shown a copy of the record prior to the commencement of the hearing. The disciplinary record shall be submitted to the committee in a sealed envelope and shall not be opened until after the committee has made its findings of fact. In the event the student has been determined to be guilty of the charge or charges the records and documents introduced by the student 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.

The committee shall deliberate in closed session. The committee's decision shall be based solely on the testimony and evidence presented at the hearing and the papers filed by the parties.

The student shall be sent a copy of the faculty-student disciplinary committee's decision within five days of the conclusion of the hearing. The decision shall be final subject to the student's rights of appeal.

Where a student is represented by legal counsel the president of the College may request that a lawyer from the general counsel's office appear at the hearing to present the College's case.

Section 15.4 Appeals

An appeal from the decision of the faculty-student disciplinary committee may be made to the president who may confirm or decrease the penalty but not increase it. His/her decision shall be final except in the case of dismissal or suspension for more than one term. An appeal from a decision of dismissal or suspension for more than

one term may be made to the appropriate committee of the board. Any appeal under this section shall be made in writing within fifteen 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 board committee as the case may be. If the president is a party to the dispute, his/her functions with respect to an appeal shall be discharged by an official of the university to be appointed by the chancellor.

Section 15.5 Committee Structure

Each faculty-student disciplinary committee shall consist of two faculty members and two student members and a chairperson. A quorum shall consist of three members.

The chairperson shall be selected by the president. At the president's discretion, a chairperson may be a staff or faculty member selected from another campus. The chairperson shall preside at all of the faculty-student disciplinary meetings, decide and make all rulings for the committee and shall be a voting member of the committee.

The faculty members shall be selected by lot from a panel of six elected annually by the appropriate faculty body from among the persons having faculty rank or faculty status. The student members shall be selected by lot from a panel of six elected annually in an election in which all students registered at the College shall be eligible to vote. 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 individual on the panel shall serve on the panel for more than two consecutive years.

In the event that the chairperson cannot continue, the president shall appoint another chairperson. In the event that a student or faculty seat becomes vacant and it is necessary to fill the seat to continue the hearing, the seat shall be filled by the chairperson from the faculty or student panel by lottery.

Persons who are to be participants in the hearing 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.

Section 15.6 Suspension or Dismissal

The board reserves full power to dismiss or suspend a student or suspend a student organization for conduct which impedes, obstructs 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.

A president or full dean may in emergency or extraordinary circumstances, temporarily suspend a student or temporarily suspend the privileges of a student organization or group for cause, pending an early hearing as provided in bylaw section 15.3 to take place within not more than seven (7) school days. Prior to the commencement of a temporary suspension of a student, the College shall give such student oral or written notice of the charges against him/her and, if he/she denies them, the College shall forthwith give such student an informal oral explanation of the evidence supporting the charges and the student may present informally his/her explanation or theory of the matter. When a student's presence poses a continuing danger to persons 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 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 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.

CAMPUS SAFETY AND SECURITY

WORKPLACE VIOLENCE POLICY AND PROCEDURES

The City University of New York has a long-standing commitment to promoting a safe and secure academic and work environment that promotes the achievement of its mission of teaching, research, scholarship and service. All members of the University community—students, faculty and staff—are expected to maintain a working and learning environment free from violence, threats of harassment, violence,

intimidation or coercion. While these behaviors are not prevalent at the University, no organization is immune.

The purpose of this policy is to address the issue of potential workplace violence in our community, prevent workplace violence from occurring to the fullest extent possible, and set forth procedures to be followed when such violence has occurred.

Policy

The City University of New York prohibits workplace violence. Violence, threats of violence, intimidation, harassment, coercion, or other threatening behavior towards people or property will not be tolerated. Complaints involving workplace violence will not be ignored and will be given the serious attention they deserve. 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. Complaints of sexual harassment are covered under the University's Policy Against Sexual Harassment.

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 in cases where the employee or student suspects that an act of violence will result from an encounter with said individual(s).

Scope

All faculty, staff, students, vendors, contractors, consultants, and others who do business with the University, whether in a University facility or off-campus location where University business is conducted, are covered by this policy. This policy also applies to other persons not affiliated with the University, such as former employees, former students, and visitors. When students have complaints about other students, they should contact the Office of Student Affairs.

Definitions

Workplace violence is any behavior that is violent, threatens violence, coerces, harasses or intimidates others, interferes with an individual's legal rights of movement or expression, or disrupts the workplace, the academic environment, or the University's ability to provide services to the public. Examples of workplace violence include, but are not limited to:

1. Disruptive behavior intended to disturb, interfere with or prevent normal work activities (such as yelling, using profanity, verbally abusing others, or waving arms and fists).
2. Intentional physical contact for the purpose of causing harm (such as slapping, stabbing, punching, striking, shoving, or other physical attack).
3. Menacing or threatening behavior (such as throwing objects, pounding on a desk or door, damaging property, stalking, or otherwise acting aggressively; or making oral or written statements specifically intended to frighten, coerce, or threaten) where a reasonable person would interrupt such behavior as constituting evidence of intent to cause harm to individuals or property.
4. Possessing firearms, imitation firearms, knives or other dangerous weapons, instruments or materials. No persons within the University community, shall have in their possession a firearm or other dangerous weapon, instrument or material that can be used to inflict bodily harm on an individual or damage to University property without specific written authorization from the Chancellor or the College President, regardless of whether the individual possesses a valid permit to carry the firearm or weapon.

Reporting of Incidents

1. General Reporting Responsibilities

Incidents of workplace violence, threats of workplace violence, or observations of workplace violence are not to be ignored by any member of the University

community. Workplace violence should promptly be reported to the appropriate University official (see below). Additionally, faculty, staff and students are encouraged to report behavior that they reasonably believe poses a potential for workplace violence as defined above. It is important that all members of the University community take this responsibility seriously to effectively maintain a safe working and learning environment.

2. Imminent or Actual Violence

Any person experiencing or witnessing imminent danger or actual violence involving weapons or personal injury should call the Campus Public Safety Office immediately, or call 911.

3. Acts of Violence Not Involving Weapons or Injuries to Persons

Any person who is the subject of a suspected violation of this policy involving violence without weapons or personal injury, or is a witness to such suspected violation, should report the incident to his or her supervisor, or in lieu thereof, to his or her respective Campus Public Safety Office. Students should report such incidents to the Office of Student Affairs at their campus or in lieu thereof, their campus Public Safety Office. The Campus Public Safety Office will work with the Office of Human Resources and the supervisor or the Office of Student Affairs on an appropriate response.

4. Commission of a Crime

All individuals who believe a crime has been committed against them have the right, and are encouraged, to report the incident to the appropriate law enforcement agency.

5. False Reports

Members of the University community who make false and malicious complaints of workplace violence, as opposed to complaints which, even if erroneous, are made in good faith, will be subject to disciplinary action and/or referral to civil authorities as appropriate.

6. Incident Reports

The University will report incidents of workplace violence consistent with the College Policies for Incident Reporting Under the Campus Security Policy and Statistical Act (Cleary Act).

Education

Colleges are responsible for the dissemination and enforcement of this policy as described herein, as well as for providing opportunities for training in the prevention and awareness of workplace violence. The Office of Faculty and Staff Relations will provide assistance to the campuses in identifying available training opportunities, as well as other resources and tools (such as reference materials detailing workplace violence warning signs) that can be incorporated into campus prevention materials for dissemination to the College community. Additionally, the Office of Faculty and Staff Relations will offer periodic training opportunities to supplement the College's training programs.

Confidentiality

The University shall maintain the confidentiality of investigations of workplace violence to the extent possible. The University will act on the basis of anonymous complaints where it has a reasonable basis to believe that there has been a violation of this policy and that the safety and well-being of members of the University community would be served by such action.

Retaliation

Retaliation against anyone acting in good faith who has made a complaint of workplace violence, who has reported witnessing workplace violence, or who has been involved in reporting, investigating, or responding to workplace violence is a violation of this policy. Those found responsible for retaliatory action will be subject to discipline up to and including termination.

Approved by the Board of Trustees,
June 28, 2004

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/students/registrar/policies-stu.html>, 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 www.ope.ed.gov/security. Type "CUNY New York City College of Technology" under institution name to view the most recent statistics.

POLICY AGAINST SEXUAL HARASSMENT

It is the policy of The City University of New York to promote a cooperative work and academic environment in which there exists mutual respect among all University students, faculty, and staff. Harassment of employees or students based upon sex is inconsistent with this objective and contrary to the University's non-discrimination policy. Sexual harassment is illegal under Federal, State, and City laws, and will not be tolerated within the University.

The University, through its colleges, will disseminate this policy and take other steps to educate the University community about sexual harassment. The University will establish procedures to ensure that investigations of allegations of sexual harassment are conducted in a manner that is prompt, fair, thorough, and as confidential as possible under the circumstances, and that appropriate corrective and/or disciplinary action is taken as warranted by the circumstances when sexual harassment is determined to have

occurred. Members of the University community who believe themselves to be aggrieved under this policy are strongly encouraged to report the allegations of sexual harassment as promptly as possible. Delay in making a complaint of sexual harassment may make it more difficult for the College to investigate the allegations.

A. Prohibited Conduct

It is a violation of University policy for any member of the University community to engage in sexual harassment or to retaliate against any member of the University community for raising an allegation of sexual harassment, for filing a complaint alleging sexual harassment, or for participating in any proceeding to determine if sexual harassment has occurred.

B. Definition of Sexual Harassment

For purposes of this policy, sexual harassment is defined as unwelcome sexual advances, requests for sexual favors, and other oral or written communications or physical conduct of a sexual nature when:

1. submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment or academic standing;
2. submission to or rejection of such conduct by an individual is used as a basis for employment or academic decisions affecting such individual; or
3. such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile or abusive work or academic environment.

Sexual harassment can occur between individuals of different sexes or of the same sex. Although sexual harassment most often exploits a relationship between individuals of unequal power (such as between a faculty member and student, supervisor and employee, or tenured and untenured faculty members), it may also occur between individuals of equal power (such as between fellow students or co-

workers), or in some circumstances even where it appears that the harasser has less power than the individual harassed (for example, a student sexually harassing a faculty member).

A lack of intent to harass may be relevant to, but will not be determinative of, whether sexual harassment has occurred.

C. Examples of Sexual Harassment

Sexual harassment may take different forms. Using a person's response to a request for sexual favors as a basis for an academic or employment decision is one form of sexual harassment. Examples of this type of sexual harassment include, but are not limited to, the following:

- requesting or demanding sexual favors in exchange for employment or academic opportunities (such as hiring, promotions, grades, or recommendations);
- submitting unfair or inaccurate job or academic evaluations or grades, or denying training, promotion, or access to any other employment or academic opportunity, because sexual advances have been rejected.

Other types of unwelcome conduct of a sexual nature can also constitute sexual harassment, if sufficiently severe or pervasive that the target does find, and a reasonable person would find, that an intimidating, hostile or abusive work or academic environment has been created. Examples of this kind of sexual harassment include, but are not limited to, the following:

- sexual comments, teasing, or jokes;
- sexual slurs, demeaning epithets, derogatory statements, or other verbal abuse;
- graphic or sexually suggestive comments about an individual's attire or body;
- inquiries or discussions about sexual activities;
- pressure to accept social invitations, to meet privately, to date, or to have sexual relations;

- sexually suggestive letters or other written materials;
- sexual touching, brushing up against another in a sexual manner, graphic or sexually suggestive gestures, cornering, pinching, grabbing, kissing, or fondling;
- coerced sexual intercourse or sexual assault.

D. Consensual Relationships

Amorous, dating, or sexual relationships that might be appropriate in other circumstances have inherent dangers when they occur between a faculty member, supervisor, or other member of the University community and any person for whom he or she has a professional responsibility. These dangers can include: that a student or employee may feel coerced into an unwanted relationship because he or she fears that refusal to enter into the relationship will adversely affect his or her education or employment; that conflicts of interest may arise when a faculty member, supervisor, or other member of the University community is required to evaluate the work or make personnel or academic decisions with respect to an individual with whom he or she is having a romantic relationship; that students or employees may perceive that a fellow student or co-worker who is involved in a romantic relationship will receive an unfair advantage; and that if the relationship ends in a way that is not amicable, either or both of the parties may wish to take action to injure the other party.

Faculty members, supervisors, and other members of the University community who have professional responsibility for other individuals, accordingly, should be aware that any romantic or sexual involvement with a student or employee for whom they have such a responsibility may raise questions as to the mutuality of the relationship and may lead to charges of sexual harassment. For the reasons stated above, such relationships are strongly discouraged.

For purposes of this section, an individual has "professional responsibility" for

another individual at the University if he or she performs functions including, but not limited to, teaching, counseling, grading, advising, evaluating, hiring, supervising, or making decisions or recommendations that confer benefits such as promotions, financial aid awards or other remuneration, or that may impact upon other academic or employment opportunities.

E. Academic Freedom

This policy shall not be interpreted so as to constitute interference with academic freedom.

F. False and Malicious Accusations

Members of the University community who make false and malicious complaints of sexual harassment, as opposed to complaints which, even if erroneous, are made in good faith, will be subject to disciplinary action.

G. Procedures

The University has developed procedures to implement this policy. The President of each constituent college of the University, the Senior Vice Chancellor at the Central Office, and the Dean of the Law School shall have ultimate responsibility for overseeing compliance with this policy at his or her respective unit of the University. In addition, each dean, director, department chairperson, executive officer, administrator, or other person with supervisory responsibility shall be required to report any complaint of sexual harassment to the individual or individuals designated in the procedures. All members of the University community are required to cooperate in any investigation of a sexual harassment complaint.

H. Enforcement

There is a range of corrective actions and penalties available to the University for violations of this policy. Students, faculty, or staff who are found, following applicable disciplinary proceedings, to have violated this Policy are subject to various penalties, including termination of employment and/or student expulsion from the University.

Effective October 1, 1995, revised January 1, 2005

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.

Academic Departments & Programs

www.citytech.cuny.edu/academics

Library

Professor Darrow Wood, Chair
Atrium Building, 4th floor
718.260.5497
email: dwood@citytech.cuny.edu

FACULTY:

Professors: Gonzalez, Swacker, Wood
Associate Professors: Berger, Grassano, Hounion, Tobin
Assistant Professors: Densmore, Leonard, Lu, Muchowski, Smale,
Tidal

LIBRARY

The Library Department offers library classes and workshops to members of the college community, to help students, staff and faculty conduct research and find information appropriate to their needs. The Library's instructional focus is on strengthening students' information literacy competencies in finding, evaluating and ethically using information. Our course addresses skills and proficiencies that are critical for our students as they prepare to enter a variety of careers in the 21st century. The library's course is interdisciplinary, and may be taken to satisfy core requirements in communications (COMM) or as an elective (ELECT).

For more information about the library's facilities and services, see Academic Services and Special Programs (page 47).

COURSE:

LIB 1201 Research and Documentation in the Information Age

COMM Core

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

SCHOOL OF ARTS AND SCIENCES

Karl Botchway, Interim Dean of Arts and Sciences

Namm Hall, room N 805

718.260.5008

email: kbotchway@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	Biological Sciences
Chemistry	English
Humanities	Mathematics
Physics	Social Science

Degree Programs:

Applied Math (BS)	Computer Science (AS)
Liberal Arts (AA)	Liberal Arts and Sciences (AS)
Chemical Technology (AAS)	CUNY Baccalaureate for Unique Interdisciplinary Studies

Mission

The School of Arts and Sciences awards associate degrees in liberal arts and sciences, chemical technology and computer science.

A Bachelor of Science degree in applied mathematics with concentrations in information science, financial science or science, is 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 core curriculum required of all technical and career programs.

Courses offered by the African American Studies Department are interdisciplinary and satisfy literature, aesthetics, social science and behavioral science core requirements. An option in African American Studies within the LAA degree is available. Courses within the Departments of Biological Sciences, Chemistry and Physics satisfy the science core requirements. The Chemistry Department also offers the Chemical Technology degree program. 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. 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 core requirements, or can be taken as enriching electives. The applied math and computer science 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 core requirements.

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 NSF-funded Science and Technology Scholars Program, and the CUNY Compact-funded Emerging 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 Marta Effinger-Crichlow, Interim Chair
Atrium Building, room A 643
718.260.5205
email: meffinger@citytech.cuny.edu

FACULTY:

Associate Professors: Botchway, Effinger-Crichlow
Assistant Professors: James, Panford, Walker
Lecturer: Wilson

AFRICAN AMERICAN STUDIES

The African American Studies Department is designed to bring into focus, through inter-departmental and multicultural course offerings in liberal arts and sciences, the history and culture of Africans and their descendants throughout the African diaspora from antiquity to the present. Readings and classroom lectures bring research, critical analysis, synthesis and interpretation to bear on the contributions of peoples of African descent to the evolution of human civilization, an approach that stimulates intellectual growth and the development of humanistic principles. Courses in African American Studies are interdisciplinary and satisfy core requirements in aesthetics (AES), behavioral sciences (BS), social science (SS), literature (LIT) and philosophy (PHIL), or can be used for elective credit (ELECT).

Option in African American Studies

Add a specialty to your Associate degree in Liberal Arts with an option in African American Studies. An option is an area of concentrated study in an associate degree program. The option in African American Studies in the Liberal Arts program will enable the student to develop a deeper understanding of African American Studies through study of the humanities, literature, history/social science and philosophy.

REQUIREMENTS

The option in African American Studies requires the completion of a total of 12 credit hours to be created from the following menu of courses:

Humanities – 3 credits

AFR 1301	Introduction to the Arts of Africa AES CORE [Partially on line]	3
AFR 1311	African American Caribbean Music AES CORE	3

Literature – 3 credits

AFR 2201	Early Black Writers in American Literature LIT CORE	3
AFR 2222	Current Caribbean Literature LIT CORE [Partially on line]	3
AFR 2250	Black Women in Literature LIT CORE	3

History and Social Science – 3 credits

AFR 1460	Early African History SS CORE	3
AFR 1465	Early African American History SS CORE	3
AFR 1462	Blacks in Science, Technology and Business SS CORE	3
AFR 1501	Seminar in Current Community Problems BS CORE	3

REQUIRED COURSE

PHIL	Philosophy	3
AFR 2612	Africana Philosophy and Religion PHIL CORE	3

COURSES:

AFR 1130

Africana Folklore

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

AES Core

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

AFR 1304

African American/Caribbean Art

AES Core

3 cl hrs, 3 cr

A survey course of 18th to 20th century Black Art from the United States, Canada and the Americas. Prerequisite: CUNY proficiency in reading and writing

AFR 1311

African American/Caribbean Music

AES Core

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

AES Core

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
SS Core

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
SS Core

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
SS Core

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
SS Core

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
SS Core

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
SS Core

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
SS Core

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
BS Core

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
BS Core

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
3 cl hrs, 3 cr

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 2201
Early Black Writers in American Literature
LIT Core

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
LIT Core

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

AFR 2211
Early African Literature
LIT Core

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
LIT Core

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
LIT Core

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
LIT Core

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
AES Core

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
SS Core

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

AFR 2612
Africana Philosophy and Religion
PHIL Core

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

Biological Sciences

Professor Walied Samarrai, Chair
 Pearl Building, room P 305
 718.260.5088
 email: wsamarrai@citytech.cuny.edu

Professor Armando Solis, Coordinator, Biomedical Bioinformatics
 Pearl Building, room P 305
 718.260.5088
 email: asolis@citytech.cuny.edu

PROGRAM

Biomedical Informatics/BS

FACULTY:

Professor: Dabydeen
 Associate Professors: Bakewicz, Chakraborty, Karthikeyan, Kolchenko, Samarrai
 Assistant Professors: Alcendor, Barjis, Chowdhury, Flaherty, Haque, Karthikeyan, Li, Montes-Matias, Solis, Seto, Smyth, Tsenova, Voza, Williams, Yehia, Zameer
 Lecturer: Sodeinde

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.

REQUIRED COURSES IN THE MAJOR		Credits
Biological Sciences and Molecular Bioinformatics		
BIO 1101	Biology I	4
BIO 1201	Biology II	4
BIO 2311	Anatomy and Physiology I	4
BIO 2312	Anatomy and Physiology II	4
BIO 3350	Bioinformatics I	4
BIO 3352	Bioinformatics II	4
BIO 3354	Computational Genomics	3
BIO 3356	Molecular Modeling in Biology	3
BIO 3526	Pathophysiology	3
BIO 3620	Molecular and Cell Biology	4
Subtotal		37
Computer and Healthcare Informatics Courses		
MED 2400	Medical Informatics Fundamentals	3
MED 4229	Healthcare Databases	3
HSA 3510	Health Services Management I	3
HSA 4620	Healthcare Information Systems	3
CST 1101	Problem Solving with Computer Programming	3
CST 1201	Programming Fundamentals	
or		
CST 2403	Introductory C++ Programming Language	3
CST 1204	Database Systems Fundamentals	3
Subtotal		21
Internship/Research Course		
MED 3910	Internship/Research in Biomedical Informatics	5
Subtotal		5
ADDITIONAL REQUIRED COURSES		Credits
ENG 1101	English Composition I	3
ENG 1133	Specialized Communication for Tech. Students	3
ENG 3404	The Literature of Illness and Care	3
MAT 1475 ¹	Calculus I	4
MAT 1372	Statistics with Probability	
or		
MAT 2572	Probability and Mathematical Statistics I	3/4
PHIL 2203	Health Care Ethics	3
PSY 1101	Introduction to Psychology	3
BS	Behavioral Science	3
COMM	Speech Communication	3
LAP	Literature/Aesthetics	3
SS	Social Science Core Course	3
Subtotal		34-35
TOTAL REQUIRED COURSES		97-98
<i>1 Students not eligible to take MAT 1475 will be required to take the appropriate mathematics prerequisites: MAT 1175, MAT 1275, and MAT 1375.</i>		
ELECTIVE COURSES		Credits
Choose from the following courses listed below to reach a total of 22-23 elective credits. Students must have at least 15 credits in one of two Elective Areas. The choice of electives, to be made in close consultation with the Program Coordinator or Academic Advisor, should reflect the student's interests, post-baccalaureate study plans, and career goals.		
Science and Health Professions Electives		
BIO 3601	Biochemistry	4
BIO 3524	Nutrition	2
CHEM 1110	General Chemistry I	4
CHEM 1210	General Chemistry II	4
CHEM 2223	Organic Chemistry I	5
CHEM 2323	Organic Chemistry II	5
PHYS 1441	Physics 1.3, PHYS 1441L	5
PHYS 1442	Physics 2.3, PHYS 1442L	5
HSA 3510	Health Services Management II	3
HSA 3560	Legal Aspects of Health Care	3
HSA 3630	Health Care Finance and Accounting Management	3
Computation and Computer Systems Electives		
CST 1215	Operating Systems Fundamentals	3
CST 2307	Networking Fundamentals	3
CST 2309	Web Programming I	3
CST 2406	Introduction to Systems Analysis and Design	3
CST 2409	Web Programming II	3
CST 3503	C++ Programming Part II	3
CST 3504	Design of Microcomputer Databases	3
CST 3510	Computer Security	3
CST 3513	Object Oriented Programming in Java	3
CST 3603	Object Oriented Programming	3
CST 3604	Design of Distributed Databases	3
MST 1204	Database Systems and Programming	3
MST 1205	Microcomputer Systems	3
MST 2307	Local Area Networks	4
MST 2405	Microcomputer Operating Systems	4
MAT 1575	Calculus II	4
MAT 2440	Discrete Structures and Algorithms I	3
MAT 2540	Discrete Structures and Algorithms II	3
MAT 2580	Introduction to Linear Algebra	3
MAT 2675	Calculus III	4
MAT 2680	Differential Equations	3
MAT 3672	Probability and Mathematical Statistics II	4
MAT 3772	Stochastic Models	3
MAT 4872	Probability and Mathematical Statistics III	4
TOTAL ELECTIVE COURSES		22-23
TOTAL CREDITS REQUIRED FOR THE DEGREE		120

COURSES:**BIO 1101
Biology I
SCI Core**

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 1201
Biology II
SCI Core**

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
SCI Core**

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
SCI Core**

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 3302
Microbiology
SCI Core**

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)
SCI Core**

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, 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, 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*

**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*

Chemistry

Professor Peter Spellane, Chair
 Pearl Building, room P 618
 718.260.5850
 email: pspellane@citytech.cuny.edu

PROGRAM:

Chemical Technology/AS

FACULTY:

Professor: Zimmerman
 Associate Professors: Brown, Nicolas, Spellane
 Assistant Professors: Deiner, Martinez, Samaroo, Tewani
 Senior CLTs: DeFaria, 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, organic, and analytical chemistry, as well as physics; calculus; elective courses in science or mathematics; six credits of English composition; six credits in the humanities and social/behavioral sciences and three credits in information literacy.

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. Experience in literature, aesthetics or philosophy and the behavioral or social sciences.

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.

REQUIRED COURSES IN THE MAJOR

Chemistry Courses

		Credits
CHEM 1110	General Chemistry I	4
CHEM 1210	General Chemistry II	4
CHEM 2223	Organic Chemistry I	5
CHEM 2323	Organic Chemistry II	5
CHEM 3312	Analytical Chemistry	5
	or	
CHEM 3412	Instrumental Methods of Analysis	5

Mathematics Course

MAT 1475 ²	Calculus I	4
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Physics Courses

PHYS 1441	Physics 1.3	5
PHYS 1442	Physics 2.3	5

Subtotal **37**

Mathematic or Science 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
or		
CHEM 3412	Instrumental Methods of Analysis	5
MATH 1575	Calculus II	4
MATH 2675	Calculus III	4
PHYS 1117	Astronomy I	4
PHYS 1118	Astronomy II: Stars, Galaxies, Cosmology	4
PHYS 2443	Physics 3.3	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

Subtotal 8**ADDITIONAL REQUIRED COURSES¹**

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
LIB 1201	Research and Documentation in the Information Age	3
LAP ¹	Literature/Aesthetics/Philosophy	3
SS/BS	Social Science/Behavioral Science	3

Subtotal 15**TOTAL CREDITS REQUIRED FOR THE DEGREE** 60¹ See page 35 for a detailed explanation of core-required courses and categories.

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 up to twelve (12).

COURSES:**CHEM 1000****Principles of Chemistry**

3 cl hrs, 3 lab hrs, 4 cr

(For dental hygiene and restorative dentistry students only). Atomic structure, elements, compounds and mixtures, formulas and nomenclature, physical states, bonding, acid-base theory, solutions, gas laws.

Prerequisites: Eligibility for ENG 092R or CUNY proficiency in reading and mathematics

CHEM 1110**General Chemistry I****SCI Core**

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, ENG 092R

CHEM 1210**General Chemistry II****SCI Core**

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

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

ESCI 1110
Environmental Science I

3 cl hrs, lab hours are included in the class hours, 3 cr

An introductory environmental science course. Topics include fundamentals of environmental science; visualization; GIS and mapping; water quality and hydrology; air quality; wetlands.

Prerequisite: CUNY proficiency in reading and writing; Corequisites: MAT 1175 or higher

ESCI 1210
Environmental Science II

3 cl hrs, lab hours are included in the class hours, 3 cr

A continuation of ESCI 1110. Topics include energy; ecosystems; solid and hazardous waste; pressure and temperature; volume, mass and flow; population growth; global warming; environmental management and economics.

Prerequisite: ESCI 1110

English

Professor Nina Bannett, Chair
Namm Hall, room N 512
718.260.5392
email: nbannett@citytech.cuny.edu

FACULTY:

Professors: Feder, Hanley, Huffman, Nilles, Richardson, Rudden, Saddik
Associate Professors: Bannett, Barlow, Ferrell, Guida, Mushabac, Noonan, Williams
Assistant Professors: Belli, But, Devers, Do, Falvey, Ferdinand, Garcia, Gold, Goodison, Grujicic-Alatriste, Hall, Harris, Hellman, Lansiquot, Leston, Rodgers, Rosen, Saberi, Scanlan, Shapiro, Westengard
Lecturers: Bear, Freeman-Marshack, Hirsch

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. 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.

In the associate degree core, students select one course from the literature, aesthetics or philosophy category (LAP). In the baccalaureate core, students select three courses from LAP, with courses from two of the three areas. Students can satisfy the literature core by taking any literature course offered by the English Department, Latin American Studies program or the African American Studies Department (ENG or LAS or AFR).

Similarly, the associate core requires communications. ENG 1121 or a higher series course can be taken to meet this core distribution. Baccalaureate students must take ENG 1121 if not taken at the associate level.

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

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.

Program in ENGLISH AS A SECOND LANGUAGE (ESOL)

Professor Lubie Grujicic-Alatriste, Program Coordinator
Namm Hall, room N 503
718.260.5208
email: esol@citytech.cuny.edu or lalatriste@citytech.cuny.edu

The program in English as a second language 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/ Grammar	ESOL 011W 6 hrs	ESOL 021W 6 hrs	ESOL 031W 3 hrs
Reading	ESOL 012R 3 hrs	ESOL 022R 3 hrs	ESOL 032R 3 hrs

ESOL 1300, Oral Communications Skills for English Language Learners may be taken by any student who is taking any ESOL course, with either reading proficiency or departmental 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
Core***3 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
COMM Core***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
COMM Core***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
COMM Core***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
COMM Core***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
COMM Core***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 1773
Weird Science: Interpreting
and Redefining Humanity
COMM Core***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
LIT Core***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****LIT Core***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****LIT Core***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****LIT Core***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****LIT Core***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****LIT Core***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****LIT Core***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 2200
American Literature I****LIT Core***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
LIT Core

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
LIT Core

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
LIT Core

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
LIT Core

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

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.

Pre- or corequisite: ENG 1101

ENG 3401
Law Through Literature
LIT Core

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
LIT Core

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, PRS)

ENG 3403
One Major Writer
LIT Core

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, PRS)

ENG 3404
The Literature of Illness and Care
LIT Core

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, PRS)

ENG 3771
Advanced Career Writing
COMM Core

3 cl hrs, 3 cr

An advanced 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

ENG 3773
Advanced Technical Writing
COMM Core

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.

Prerequisites: ENG 1121 or ENG 1133 and MST 1101 or equivalent

LANGUAGE AND LINGUISTICS

ENG 1100
Language, Culture and Society

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 AS A SECOND LANGUAGE

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/EL 011. 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 Communication Skills
for English Language
Learners**

2 cl hrs, 2 lab hrs, 3 cr

A course designed specifically to improve the pronunciation and listening skills of non-native speakers of English. Emphasis is on distinguishing and producing the sounds, stress and intonation patterns of American English.

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 SPE 1320 may not obtain degree credit for ESOL 1300

Humanities

Professor Cathy Santore, Chair
Atrium Building, room A 630
718.260.5018
email: csantore@citytech.cuny.edu

FACULTY:

Professors: Fischer, Porter, Santore
Assistant Professors: Cheng, Davis, Delbene, Delilkan, DeZego,
Granados, Lichterman, Scannell-Guida, Smolinsky, Standing,
Swift, Vey
Lecturer: McAuliffe

HUMANITIES

The Humanities focus on those elements of human culture that spring from the rational and artistic creativity of the human spirit. In every society, creativity expresses itself in art, language, music and the performing arts. Both the creation of these forms of expression and the developed ability to comprehend them provide a deeply enriching and ennobling influence on one's life.

Speech, theatre and performing arts courses offered in the department provide students with both the oral communication skills necessary for academic, career and personal advancement and the aesthetic awareness derived from study of the theory and practice of the performing arts.

Most courses offered in the Humanities Department are part of degree-granting programs. Courses are offered in foreign languages, art history, music, performing arts, speech and theatre. These courses may be taken to fulfill core requirements in foreign languages, communications (COMM), aesthetics (AES) or as electives. Courses in Latin American studies are also offered. These courses fulfill the core requirements in behavior science (BS), social sciences (SS) or literature (LIT).

COURSES:

FOREIGN LANGUAGES

ARB 1101 Elementary Arabic I

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

3cl 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

(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

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

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

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**

3 cl hrs, 3 cr
For beginning students of French. Includes basic grammar, pronunciation and development of basic vocabulary. Provides practice in spoken as well as written language.
Prerequisite: Department approval

**FREN 1102
Elementary French II**

3 cl hrs, 3 cr
A continuation of FREN 1101.
Prerequisite: FREN 1101 or department approval

**FREN 2201
Intermediate French I**

3 cl hrs, 3 cr
Intended to increase the student's ability to understand and use French through practice in conversation, writing and reading from French literature and civilization. It includes a systematic review of the essentials of grammar.
Prerequisite: FREN 1102 or department approval

**FREN 2202
Intermediate French II**

3 cl hrs, 3 cr
A continuation of FREN 2201.
Prerequisite: FREN 2201 or department approval

**SPA 1101
Elementary Spanish I**

3 cl hrs, 3 cr
A course for beginning students of Spanish, covering basic grammar, pronunciation, and vocabulary. Students practice both spoken and written language. Language lab assignments are required.
Prerequisite: Department approval

**SPA 1102
Elementary Spanish II**

3 cl hrs, 3 cr
Grammar and pronunciation are studied as well as the correct usage of the preterit and the imperfect tenses. More extensive vocabulary and idiomatic phrases are learned. Language lab assignments are required.
Prerequisite: SPA 1101 or department approval

**SPA 2201
Intermediate Spanish I**

3 cl hrs, 3 cr
Students increase ability to understand and use Spanish through practice in writing, conversation, and by reading excerpts from Spanish literature. A systematic review of the essentials of grammar, focusing on the subjunctive mood and future tense. Aspects of Spanish civilization are considered.
Prerequisite: SPA 1102 or department approval

**SPA 2202
Intermediate Spanish II**

3 cl hrs, 3 cr
The essentials of grammar are reviewed, and advanced grammatical constructions are learned through the reading of excerpts from Spanish literature and conversation, and practiced by essay writing. Conducted largely in Spanish.
Prerequisite: SPA 2201 or department approval

**SPA 3301
Survey of Early Spanish Literature**

(spring only)
3 cl hrs, 3 cr
A survey of Spanish literature from the Middle Ages to the end of the eighteenth century. Students are assessed on readings, discussions and composition, and are expected to develop tools of critical analysis as applied to prose and poetry. Conducted in Spanish.
Prerequisite: SPA 2202 or department approval

**SPA 3302
Survey of Modern Spanish Literature**

(fall only)
3 cl hrs, 3 cr
A survey of Modern Spanish literature, covering the period from the beginning of the nineteenth century to the present. Students are assessed on readings, discussions and composition, and are expected to develop tools of critical analysis as applied to prose and poetry. Conducted in Spanish.
Prerequisite: SPA 3301 or department approval

ART HISTORY

**ARTH 1100
History and Appreciation of Photography**

AES Core
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**

AES Core
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**

AES Core
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**

AES Core
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**

AES Core
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**

AES Core
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**

AES Core
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**

AES Core
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 2321/ARCH 2321
History of Architecture: 1900 to the Present (Writing Intensive)**

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**

AES Core
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

AES Core
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*

MUSIC

MUS 1201 Musical Concepts: A Guide to Listening

AES Core
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

AES Core
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

AES Core
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

AES Core
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 2206 Jazz

AES Core
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. 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

AES Core
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 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 1120 Drama Workshop

1 cl hr, 2 lab hrs, 2 cr

The techniques needed to convey character in various styles of acting are approached through self-exploration and a heightened awareness of senses and emotions. Techniques of analysis: training in the use of objective information that one receives from society and environment to make artistic statements; training the voice and body to make better use of the tools of the theatre. *Prerequisite: None*

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*

SPEECH

Speech placement test: All non-native speakers of English are required to take the department's speech placement test prior to registering for speech courses.

SPE 1320 Voice and Diction

COMM Core
3 cl hrs, 3 cr

Instruction and practice in basic elements of voice and speech production, speech and vocal mechanisms, analysis of American English speech sounds and techniques of controlling pitch, volume and rate of speaking. Standard and non-standard American English dialect patterns examined. *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 SPE 1320*

SPE 1330 Effective Speaking

COMM Core
3 cl hrs, 3 cr

Practice in presenting extemporaneous speeches, textbook readings, preparation of speech outlines and reading of resource material for research in speech. *Prerequisite: CUNY proficiency in reading and writing*

SPE 1335 Group Discussion Methods

COMM Core

3 cl hrs, 3 cr

Instruction and practice in the fundamental concepts of constructive group communication and interaction. Characteristics of groups, types of discussion formats, problem-solving skills and participation and leadership in groups examined. *Prerequisite: CUNY proficiency in reading and writing*

SPE 1340 Oral Interpretation of Literature

COMM Core
3 cl hrs, 3 cr

An advanced course in voice and diction, with focus on the use of vocal variation techniques to project the meaning of written material. Techniques developing poise and confidence are taught. Audio and video tapings are used to reinforce developing skills. *Prerequisite: CUNY proficiency in reading and writing*

SPE 2401 International Communication

COMM Core
3 cl hrs, 3 cr

This course examines international communication from both global and local perspectives. On the global level, it looks at a number of key nation-to-nation concerns: the flow of news and information, power, trade, economics, and ethical issues such as human rights, social justice, and the preservation of peace. On the local level, this course explores the context of the people who are involved in international communication, paying close attention to the social, cultural, and historical factors that guide people's behaviors and shape their associated belief systems. *Prerequisite: ENG 1101*

SPE 2402 Intercultural Communication

3 cl hrs, 3 cr

This course focuses on two critical areas of intercultural communication: intrapersonal communication of the self, and interpersonal communication of cultural groups. Both self and group awareness are essential for understanding and tolerating the perspective of others, in order to build and live in a multicultural community. Films, creative writing, and oral presentations are variously employed as a means of applying

critical thinking skills to the issues of pluralism and diversity.

Prerequisite: ENG 1101

SPE 3401
**Communication for Business,
 Industry and the Professions**
COMM Core

3 cl hrs, 3 cr

Analysis and application of the principles of oral communication in business, industrial and professional settings. Topics include interviewing strategies, professional presentations using contemporary technologies and intercultural communication in the workplace.

Prerequisites: ENG 1121 or higher; or department approval and SPE 1330 or higher

THEATRE

THE 1280
History of the Theatre

AES Core

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: CUNY proficiency in reading and writing

THE 2180
Introduction to the Theatre

AES Core

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 2380
Play Analysis and Aesthetics
AES Core

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

Latin American Studies Program

Atrium Building, room A 642
718.260.5018

The Latin American Studies program (PRS courses) offers students a multidisciplinary curriculum taught by a faculty whose expertise encompasses psychology, anthropology, history, literature, political science and sociology, with specific application to Hispanic culture both in the United States and in Latin America. This approach prepares students for specializing in Puerto Rican and Latin American studies at upper-division colleges and for interacting with Puerto Ricans and other Latin Americans in their chosen careers, particularly if their field involves working with Hispanic/Latino constituents. Those who plan to go into careers in social work, law, teaching, health sciences and government work with community or federal agencies will find a foundation in Puerto Rican and Latin American studies useful. The courses are open to all students at the College.

COURSES:

PRS 1461
Latin American History

SS Core

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

PRS 1462
History of Puerto Rico

SS Core

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

PRS 2202
Latin American Literature

LIT Core

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

PRS 2211
Puerto Rican Literature

LIT Core

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

PRS 2501
The Puerto Rican and Latin American in New York and Urban America

BS Core

3 cl hrs, 3 cr

An overview of Puerto Rican and Latin American culture and society and its significant historical events. Factors in migration to the United States; demographic characteristics; patterns of family life and other secondary institutions; marginality and biculturalism; New York City Puerto Ricans and Latinos as they relate to established institutions (police, schools, hospitals, the economy, etc.); bilingualism; and Puerto Rican and Latino identity, life and direction.

Prerequisite: SOC 1101

Liberal Arts and Sciences Programs

Professor Michael Justin Davis, Interim Director of Liberal Arts (LAA) Advisement

Pearl Building, room P 616

718.260.5082

email: mdavis@citytech.cuny.edu

Professor Urmi Ghosh-Dastidar, Director of Liberal Arts and Sciences (LAS) Advisement

Pearl Building, room P 616

718.260.5014

email: ughosh-dastidar@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 explore several different career options, and the curriculum is designed to serve as preparation 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. An option in African American Studies is available. For details, please refer to the African American Studies Department catalog description.

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 805, at 718.260.5008, and the Director of Liberal Arts Advisement, 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 Prof. Marta Effinger-Crichlow, Director of Liberal Arts Advisement, the Pearl Building, room P 616, at 718.260.5082, 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 that 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 1275, MAT 1375, MAT 1475, MAT 1575 or MAT 2675. MAT 1175, Fundamentals of mathematics may be taken for elective credit.
- Students who choose to fulfill their computer literacy requirement by taking either CST 1100 or MST 1101 will receive credits towards the fulfillment of their liberal arts elective requirement, if they have not already fulfilled the electives graduation requirement. Students may also satisfy this requirement by successfully completing a self-learning module offered in the Atrium Learning Center. While the self-learning module can be applied toward satisfaction of the computer literacy requirement, students will not receive elective credit for this module. It is strongly recommended that students satisfy the computer literacy requirement early in their academic careers, as these skills will be of value in their other classes.

Degree requirements

The College will grant an Associate in Arts degree (AA) upon satisfactory completion of the required 60 credits as indicated:

REQUIRED COURSES		Credits
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
LANGUAGE COURSES		
FL I	Foreign Language	3
FL II	Foreign Language	3
FL III	Foreign Language	3
REQUIRED AREAS OF STUDY IN THE CORE ¹		
CAP	Capstone Course	3
HIS ²	History	6
LIT	Literature	3
MATH	Mathematics	4
PHIL	Philosophy	3
SCI I, II	Science I, II – two semester sequence	8
SPE	Speech	3
BS	Behavioral Science	3
SS	Social Science	3
AES	Aesthetics	3
ELECT	Electives	6
Computer Literacy Requirement		
TOTAL CREDITS REQUIRED FOR THE DEGREE		60

¹ See Degree Requirements on page 35 for a detailed explanation of core-required courses and categories. Two semester sequences are indicated by "I, II". For example, Biology I, II refers to BIO 1101 and BIO 1201. BIO 2311 and BIO 2312, Human Anatomy and Physiology I and II will fulfill the science core requirement.

² Students will take any two history courses. See the Degree Requirements on page 35.

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. An option in Physics is available. For details, please refer to the Physics Department catalog description.

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 Professions Studies, with permission from the Dean of Arts and Sciences, the Namm Building, room N 805, at 718.260.5008, and the Director of Liberal Arts and Sciences Advisement, 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
- Fundamental knowledge of the behavioral and social sciences
- Fundamental knowledge of philosophy
- Fundamental knowledge of literature
- Fundamental, interdisciplinary knowledge of the natural sciences including major concepts, principles and theories
- Quantitative literacy through the study of calculus

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), Computer Engineering and Baruch's Zicklin School of Business after earning the LAS degree, contact Prof. Urmi Ghosh-Dastidar, Director of Liberal Arts and Sciences Advisement, the Pearl Building, room P 616, at 718.260.5014, 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.
- Students who choose to fulfill their computer literacy requirement by taking either CST 1100 or MST 1101 will receive 3 credits towards the fulfillment of their liberal arts elective requirement, if they have not already fulfilled the electives graduation requirement. Students may also satisfy the computer literacy requirement by going to the Atrium Learning Center and successfully completing a self-learning module. While the self-learning module can be applied toward satisfaction of the computer literacy requirement, students will not receive elective credit for this module. It is strongly recommended that students

satisfy the computer literacy requirement early in their academic careers, as these skills will be of value in their other classes.

For information about the articulation with the Physicians Assistant program at SUNY Downstate Medical Center of Health Related Professionals see <http://www.citytech.cuny.edu/academics/deptsites/schoolofartsandsciences/liberalartsandsciences.shtml>

Degree Requirements

The College will grant an Associate in Science degree (AS) upon satisfactory completion of the required 60 credits as indicated.

REQUIRED COURSES		Credits
ENG 1101	English Composition I	3
MAT 1475 ¹	Calculus I and one of the following three choices	4
MAT 1575	Calculus II or	
MAT 1372	Statistics with Probability	
	and	
MAT 1476L	Calculus Laboratory (taken with MAT 1475)	
	or	
MAT 2572	Probability with Statistics I	
REQUIRED AREAS OF STUDY IN THE CORE ²		
CAP	Capstone Course	3
COMM	Communication	3
LIT	Literature	3
PHIL	Philosophy	3
SCI A I, II	Science I, II – Two Semester Sequence	8
SCI B I, II	Science I, II – Two Semester Sequence	8
BS	Behavioral Science	3
SS	Social Science	3
ELECT	Electives	15
	Computer Literacy Requirement	
TOTAL CREDITS REQUIRED FOR THE AS DEGREE		60
¹ Students without the requisite math background to enter MAT 1475 will be required to take MAT 1175 and/or MAT 1275 and/or MAT 1375 in preparation. This will increase the number of required credits for the degree by up to twelve (12).		
² See Degree Requirements on page 35 for a detailed explanation of core-required course and categories. Two semester sequences are indicated by "I, II". For example, Biology I, II refers to BIO 1102 and BIO 1201. BIO 2311 and BIO 2312, Human Anatomy and Physiology I and II will fulfill the science core requirement.		

CURRENTLY AVAILABLE CAPSTONE COURSES (subject to change)		
COURSE NUMBER	COURSE NAME	PREREQUISITE
		Any 2000 level literature course in AFR, ENG, PRS, ENG 1101
AFR 2612	Africana Philosophy and Religion	ENG 1101, Background in Humanities and Social Science and Department approval required
ARTH 2401	Italian Renaissance Art and Architecture	ENG 1101 and one of the following: ARTH 1101, ARTH 1102, ARTH 1103, or ARCH 1121
BIO 3350	Elements of Bioinformatics	MAT 1275, BIO 1101 and CUNY proficiency in reading and writing
BIO 3601	Biochemistry	ENG 1101, MAT 1275 and CHEM 2223
ENG 1773	Weird Science: Interpreting and Redefining Humanity	ENG 1101, CUNY proficiency in mathematics, computer competency necessary for taking an on-line course
CHEM 2223	Organic Chemistry I	CHEM 1210
CHEM 2323	Organic Chemistry II	CHEM 2223
ENG 3401	Law through Literature	ENG 1121
ENG 3402	Topics in Literature	ENG 1121 or any 2000-level literature course (AFR, ENG, PRS)
ENG 3403	One Major Writer	ENG 1121 or any 2000-level literature course (AFR, ENG, PRS)
ENG 3404	Literature of Illness and Care	ENG 1121 or any 2000-level literature course (AFR, ENG, PRS)
ECON 2403	Labor Management Relations	ECON 1101
GOV 2401	Constitutional Law	LAW 1201 or GOV 1101 or GOV 1102
HIS 3208	History of Immigration, Ethnicity and Nativism in America	ENG 1101 and any previous history course
HIS 3209	History of Technology	ENG 1101 and any previous history course
HIS 3402	Global Encounters: Topics in Twentieth Century World History	ENG 1101 and any previous history course
MAT 2580	Introduction to Linear Algebra	MAT 1575
MAT 2680	Differential Equations	MAT 1575

CURRENTLY AVAILABLE CAPSTONE COURSES (cont'd)

COURSE NUMBER	COURSE NAME	PREREQUISITE
PHIL 3209	Philosophy of Religion	One previous Philosophy course
PHIL 3210	Existentialism and Contemporary Life	One previous Philosophy course
PHIL 3211	Philosophy of Law	One previous Philosophy course
PHIL 3400	Environmental Philosophy	One previous Philosophy course
PHYS 2601	Introduction to Research	MAT 1375, ENG 1101 and one semester of a college science course
PHYS 2605	Introduction to Laser Physics and Photonics	PHYS 1434 or PHYS 1442
PSY 2300	Developmental Psychology	PSY 1101
PSY 2301	Child Development	PSY 1101
PSY 2302	Psychology of Adolescence and Adulthood	PSY 1101
PSY 2303	Psychology of Aging	PSY 1101
PSY 2401	Social Psychology	PSY 1101
PSY 2402	Psychology of Personality	PSY 1101
PSY 2403	Abnormal Psychology	PSY 1101
PSY 2404	Personnel and Organizational Psychology	PSY 1101
PSY 3405	Health Psychology	PSY 1101
PSY 3407	Psychology of Visual Perception	ENG 1101, PSY 1101
SOC 2401	Society, Technology and Self	SOC 1101
SOC 2403	Law and Society	SOC 1101 or PSY 1101
SOC 3301	The Emerging Global Society	ENG 1101 and one of the following: any Sociology (SOC) course, ECON 1101 or HIS 1102
SOC 3402	Sociology of Social Problems	SOC 1101, ENG 1101
SPE 3401	Communication for Business, Industry and the Professions	ENG 1121 or higher and CST 1101 or MST 1101 or Department approval and SPE 1330 or higher

Mathematics

Professor Henry Africk, Chair
 Namm Hall, room N 711
 718.260.5380
 email: hafrick@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, Ellner, Hill, Kramer, Liou-Mark, Natov, Rojas, Taraporevala
 Associate Professors: Benakli, Carley, Cermele, Chen, Deraney, Douglas, Ghezzi, Ghosh-Dastidar, Han, Kahrobaei, Katz, Reitz, Rozenblyum, Schoutens, Tradler, Yuce
 Assistant Professors: Bonanome, Calinescu, DeSantis, El-Hitti, Gitman, Greenstein, Halleck, Harrow, Johnstone, Kostadinov, Masuda, Miller, Parker, Smith, Zhou
 Lecturers: Beheshti, Colucci, Niezgodna, Singh

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 ones 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 elementary 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. 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.

REQUIRED COURSES IN THE MAJOR		Credits
MAT 1372	Statistics with Probability	3
	or	
MAT 2572	Probability and Mathematical Statistics I	4
MAT 1475 ¹	Calculus I	4
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
MAT 2580	Introduction to Linear Algebra	3
	Subtotal	21-24
ADDITIONAL REQUIRED COURSES		
CST 2403	Introductory C++ Programming I	3
CST 3503	C++ Programming II	3
PHYS 1441	Physics 1.3	5s
ENG 1101	English Composition I	3
ECON 1101	Macroeconomics	3
COMM ²	Communications	3
LAP ²	Literature/Aesthetics/Philosophy	3
	Subtotal	23

ELECTIVE COURSES

Credits

Select from the following list of electives to complete a total of 60 contributory credits (13-16)

These choices should be made in consultation with an academic advisor.

ADV 2450	Web Design I	2
ADV 3551	Web Design II-Advanced XHTML and CSS	3
ADV 3652	Web Design III-Design Studio	3
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
CST 1204	Database Systems	3
CST 2307	Networking Fundamentals	3
CST 3504	Microcomputer Databases	3
CST 3603	Object Oriented Programming	3
ECON 2301	Money and Banking	3
MAT 2588	Mathematics of Finance	3
MAT 2630	Numerical Methods	3
MAT 2572	Probability and Statistics I	4
MAT 3672	Probability and Statistics II	4
MAT 2675	Calculus III	4
MAT 2680	Differential Equations	3
MAT 2899	Independent Research Project	2
MAT 2900	Internship	2
PHYS 1442	Physics 2.3	5
COMM ²	Communications	3

Subtotal

13-16

TOTAL CREDITS REQUIRED FOR THE DEGREE

60

¹ Students not eligible 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.

² See page 35 for a detailed explanation of core-required courses and categories.

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 graduates will have the skills needed to adapt to a rapidly changing work environment. Upon graduation, students can 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.

COMMON COURSES FOR ALL APPLIED MATHEMATICS MAJORS:

REQUIRED COURSES		Credits
Mathematics Courses		
MAT 1475 ¹	Calculus I	4
MAT 1575	Calculus II	4
MAT 2440	Data Structures and Algorithms I	3
MAT 2572	Probability and Mathematical Statistics I	4
MAT 2580	Introduction to Linear Algebra	3
MAT 2630	Numerical Methods	3
MAT 2675	Calculus III	4
MAT 3770	Mathematical Modeling I-Optimization	3
MAT 4880	Mathematical Modeling II-Dynamic	3
Subtotal		31
Internship		
MAT 4900	Internship I	2
MAT 4901	Internship II	2
Subtotal		4
Computer Science		
CST 2403	Intro C++ Programming Language I	3
CST 3503	C++ Programming Part II	3
Subtotal		6

Applied Mathematics Electives/Requirements**Applied Mathematics Information Science (AIB)**

Select two of the following four courses for 6 credits:

MAT 2540	Discrete Structures and Algorithms II	3
MAT 3777	Applied Mathematics: Applications of the Wave Equations	3
MAT 3787	Applied Mathematics: Finite Fields	3
MAT 3788	Applications of the Heat Equation for Financial Matters	3
MAT 3880	Introduction to Partial Differential Equations Using Mathematical Models in Biology	3
MAT 4672	Computational Statistics	3
Subtotal		6

Applied Mathematics Financial Science (AFB)

Select two of the following four courses for 6 credits:

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	Applied Mathematics: Applications of the Heat Equation	3
MAT 3880	Introduction to Partial Differential Equations using Mathematical Models in Biology	3
Subtotal		6

Applied Mathematics Science (ASB)

Select two of the following courses for 6 credits:

MAT 3880	Introduction to Partial Differential Equations using Mathematical Models in Biology	3
MAT 4672	Computational Statistics	3
Subtotal		6

ADDITIONAL REQUIRED COURSES²

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
ENG 3773	Advanced Technical Writing	
or		
SPE 1330	Effective Speaking (or higher level SPE course)	3
ECON 1101	Macroeconomics	3
ECON 2301	Money and Banking	3
LIT ²	Any 2000-level literature: AFR, ENG or PRS	3
BS ²	Behavioral Science	3
LAP ²	Literature/Aesthetics/Philosophy	6
Subtotal		27

ADDITIONAL REQUIRED COURSES²

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
ENG 3773	Advanced Technical Writing	
or		
SPE 1330	Effective Speaking (or higher level SPE course)	3
ECON 1101	Macroeconomics	3
TOTAL FOR CONCENTRATION		74

CONCENTRATION IN INFORMATION SCIENCE (AIB)**Additional Telecommunications Courses**

TCET 2102	Analog and Digital Telephony	4
TCET 2242	Microcomputer Interfacing	3
TCET 3102	Digital and Data Communication	4
EET 1222	Circuit Analysis II	5
EET 1240	Electronics	4
EET 2140	Communications Electronics	3
EET 2162	Digital Electronics	3
Subtotal		26

Additional Computer Science

CST 2307	Networking Fundamentals	3
CST 3507	Advanced Local Area Networks	3
Subtotal		6

Science

PHYS 1441	Physics 1.3	5
PHYS 1442	Physics 2.3	5
Subtotal		10
ELECT	Free Elective	4

TOTAL FOR CONCENTRATION**46****CONCENTRATION IN FINANCIAL SCIENCE (AFB)****Additional Mathematics**

MAT 1476L ³	Calculus Laboratory	1
MAT 2588	The Mathematics of Finance	3
MAT 2672	Probability and Mathematical Statistics II	4
MAT 2680	Differential Equations	3
MAT 3772	Stochastic Models	3
MAT 4872	Probability and Mathematical Statistics III	4
Subtotal		18

Additional Computer Science

CST 1204	Database Systems Fundamentals	3
CST 3504	Microcomputer Databases	3
CST 3603	Object Oriented Programming	3
CST 3604	Distributed Database	3
Subtotal		15

Additional Computational Science

MAT 4672	Computational Statistics	3
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Science

Select one of the following two sequences below:

PHYS 1441	Physics 1.3 and	5
PHYS 1442	Physics 2.3 or	5
CHEM 1110	General Chemistry I and	4
CHEM 1210	General Chemistry II	4
Subtotal		8-10
ELECT	Elective	3-5

TOTAL FOR CONCENTRATION**46**

CONCENTRATION IN SCIENCE (ASB)		
Additional Mathematics		
MAT 1476L ³	Calculus Laboratory	1
MAT 2672	Probability and Mathematical Statistics II	4
MAT 2680	Differential Equations	3
MAT 3772	Stochastic Models	3
MAT 4872	Probability and Mathematical Statistics III	4
	Subtotal	15
Science		
CHEM 1110	General Chemistry I	4
CHEM 1210	General Chemistry II	4
CHEM 2223	Organic Chemistry I	5
CHEM 2323	Organic Chemistry II	5
BIO 2311	Human Anatomy and Physiology I	4
BIO 2312	Human Anatomy and Physiology II	4
	Subtotal	26
ELECT	Electives	
	TOTAL FOR CONCENTRATION	46
	TOTAL CREDITS REQUIRED FOR THE DEGREE	120
<p><i>1 Students without the necessary background for MAT 1475 will be required to take prerequisite mathematics courses before they will be admitted to the program. They will be required to take up to an additional 12 credits of the mathematics prerequisites, MAT 1175, MAT 1275 and MAT 1375.</i></p> <p><i>2 See page 35 for a detailed explanation of core-required courses and categories.</i></p> <p><i>3 Students who are not eligible to take MAT 1476L will be required to take prerequisite computer systems technology courses of up to 2 additional credits.</i></p>		

- 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 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 mathematics. This may add to the credits required for graduation.

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.

Bachelor of Science in MATHEMATICS EDUCATION

The mathematics education baccalaureate degree program is designed to prepare middle school and high school mathematics teachers. Our program will equip mathematics teachers with a solid pedagogical foundation that is complemented by an extensive mathematical background. Graduates of the program will be very competitive in finding teaching positions in New York State. They will also be 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.

REQUIRED COURSES		Credits
Mathematics Courses		
MAT 1475	Calculus I	4
MAT 1476L	Calculus Laboratory	1
MAT 1575	Calculus II	4
MAT 2070	Introduction to Proofs and Logic	3
MAT 2572	Probability and Mathematical Statistics I	4
MAT 2580	Linear Algebra	3
MAT 2630	Applied Mathematics Technology	3
MAT 2675	Calculus III	4
MAT 3020	Number Theory	3
MAT 3050	Geometry I	3
MAT 3075	Introduction to Real Analysis	4
MAT 3080	Modern Algebra	3
MAT 4030	History of Mathematics	3
MAT 4050	Geometry II	3
	Subtotal	45

Mathematics Education Courses

MEDU 1010	Foundations of Mathematics Education	3
MEDU 1020	Teaching and Learning Strategies for Mathematics Teachers	2
MEDU 2010	Pedagogy of Mathematics Applications and Technology	2
MEDU 2901	Peer Leader Training in Mathematics	1
MEDU 3010	Methods of Teaching Middle School Math.	3
MEDU 3020	Methods of Teaching Secondary School Math.	3
MEDU 3030	Assessment Techniques in Mathematics	2
MEDU 4010	Supervised Student Teaching and Seminar In Middle School Mathematics	4
MEDU 4020	Supervised Student Teaching and Seminar In Secondary School Mathematics	4
EDU 2455	Methods and Materials for Special Needs Students	3
EDU 4600	Professional Development Seminar	2
Subtotal		29

Additional Required Courses

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
SPE 1330	Effective Speaking	3
PSY 1101	Introduction to Psychology	3
PSY 2501	Child and Adolescent Development	3
or		
EDU 2610	Child and Adolescent Development	3
PSY 3502	Human Learning and Instruction	3
or		
EDU 3610	Human Learning and Instruction	3
LIT ¹	Any 2000-level literature: AFR, ENG or PRS	3
LAP ¹	Literature/Aesthetics/Philosophy	6
	Foreign Language ²	0-3
Subtotal		27-30

ELECTIVES**Science Electives**

Select one of the following three sequences:

PHYS 1441	Physics 1.3 and	5
PHYS 1442	Physics 2.3	5
CHEM 1110	Chemistry I and	4
CHEM 1210	Chemistry II or	4
BIO 1101	Biology I and	4
BIO 1201	Biology II	4
Subtotal		8-10

Applications of Mathematics Electives

Select 6-11 credits from among the following courses to make 120 credits.

Courses should be chosen from at least two areas.

ARCH 1111	Foundations I	3
ARCH 1211	Foundation II	2
ARCH 1250	Site Planning	2
CST 1101	Intro Programming	3
CST 2403	C++ Programming I	3
CST 3503	C++ Programming II	3
MAT 2680	Differential Equations	3
MAT 3770	Math Modeling I	3
MAT 4880	Math Modeling II	3
MAT 3672	Probability and Mathematical Statistics II	4
PHYS 2443	Physics 3.3	4
PHYS 2605	Introduction to Laser Physics and Photonics	4
PHYS 1117	Astronomy I	4
EET 1102	Electrical Tech	2
EET 1122	Circuit Analysis I	4
EET 1222	Circuit Analysis II	5
Subtotal		6-11

TOTAL CREDITS REQUIRED FOR THE DEGREE**120**

1. See page 35 for a detailed explanation of core-required courses and categories.
 2. The foreign language requirement may be met in any one of the following ways:
 - i. Successful completion of a 3-credit foreign language course at City Tech or transferred from another college.
 - ii. A score on a foreign language placement test, administered by the Humanities Department at City Tech, which meets or exceeds the score to be placed in the second credit-bearing course in a sequence.
 - iii. Earning a score of 85 or higher on the New York State Regents examination in a foreign language.
 - iv. A score of 4 or better on the advanced placement examination in a foreign language.
 - v. Satisfactory completion of a College Level Examination Program (CLEP) test in a foreign language.
 - vi. Graduation from a higher education institution with a bachelor's degree or its equivalent, in which the language of instruction was other than English.
- If a student satisfies the foreign language requirement by taking a 3-credit course, they will take 3 fewer credits the Application of Mathematics electives section.

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 34 or less on Pre-Algebra part OR from 15 to 21 on Algebra part of the CUNY Assessment Test in Mathematics. 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 34 or less on the Pre-Algebra part OR a score from 22 to 39 on the Algebra part of the CUNY Assessment Test in Mathematics. 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*

MATH Core

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.

MAT 1190

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: CUNY Proficiency in reading and mathematics. *Corequisites:* None

MAT 1215

Technical Mathematics with Applications I

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

MATH Core

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****MATH Core**

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 45 on the Pre-Algebra part and 45 on the Algebra part of the CUNY Assessment Text in Mathematics

MAT 1280**Quantitative Mathematics****MATH Core**

4 cl hrs, 4 cr

Topics include probability, statistics, mathematics of finance, matrices, linear programming and optimization.

Prerequisite: MAT 1180

MAT 1315**Technical Mathematics with
Applications II**

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****MATH Core**

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.

Prerequisite: MAT 1375; Not open to students who have completed MAT 2572

MAT 1375**Precalculus****MATH Core**

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 55 on the Algebra part and 36 on the College Algebra part and 25 on the Trigonometry part of the CUNY Assessment Test in Mathematics

MAT 1475**Calculus I****MATH Core**

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 50 on the College Algebra part and of at least 36 on the Trigonometry part of the CUNY Mathematics Placement 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****MATH Core**

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 arclength.

Prerequisite: MAT 1475

MAT 2070**Introduction to Proofs and
Logic**

3 cl hrs, 0 lab hrs, 3 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

MAT 2440**Discrete Structures and
Algorithms I****MATH Core**

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: CST 2403 and MAT 1375

MAT 2540**Discrete Structures and
Algorithms II**

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; Pre- or corequisite: CST 3503

MAT 2572**Probability and
Mathematical Statistics I**

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****MATH Core**

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****MATH Core**

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****MATH Core**

4 cl hrs, 4 cr

A continuation of MAT 1575. Topics include polar and parametric equations, vectors, solid analytic geometry, partial derivatives, multiple integrals, vector fields, line integrals and Green's Theorem.

Prerequisite: MAT 1575

MAT 2680**Differential Equations****MATH Core**

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: MAT 2540, MAT 2580, CST 3603 and EMT 1250; *Corequisite:* CET 3510

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: MAT 2540, MAT 2580, CST 3603 and EMT 1250; *Corequisite:* CET 3510

MAT 3020
Number Theory

3 cl hrs, 0 lab hrs, 3 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 2070

MAT 3050
Geometry I

3 cl hrs, 0 lab hrs, 3 Credits

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 2070; *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 2070

MAT 3080
Modern Algebra

3 cl hrs, 0 lab hrs, 3 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 3075

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/1 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
using Mathematical Models
in Biology

3 cl hrs, 0 lab hrs, 3 cr

Topics include functions of several variables, Conservation Equation, Convection, Diffusion, and Attraction, Population dispersion models, Steady States and Traveling Waves, Applications of partial differential equations.

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 17- 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 2070, MAT 3020

MAT 4050
Geometry II

3 cl hrs, 0 lab hrs, 3 c

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 2672

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, Erland, 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 hrs, 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 1020
Teaching and Learning Strategies for Mathematics Teachers***1 cl hr, 2 lab hours, 2 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***MEDU 2010
Pedagogy of Mathematics Applications and Technology***1 cl hr, 2 lab hrs, 2 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 1475, MEDU 1020***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 3010
Methods of Teaching Middle School Mathematics***3 cl hrs (= 6 field hours/week),**0 lab hrs, 3 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 high schools.

*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, 3 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 3010***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 3010***MEDU 4010
Supervised Student Teaching and Seminar in Middle School Mathematics***1 cl hr (= 9 field hours/week),**0 lab hrs, 4 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 3010 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, 4 crs*

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.

Physics

Professor Roman Kezerashvili, Chair
Namm Hall, room N 811
718.260.5276
email: rkezerashvili@citytech.cuny.edu

FACULTY:

Professors: Kezerashvili
Associate Professor: Blake, Boyko, Maller
Assistant Professors: Acquaviva, Berman, Ferrogliola, Gelman,
Grigorenko, Kolmakov, Krym, Leng, Mongroo, Ossola,
Vazquez-Poritz

Senior CLT: Grace
CLT: 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.

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.

REQUIRED COURSES IN THE MAJOR		Credits:
PHYS 1441	Calculus-Based University Physics I	5
PHYS 1442	Calculus-Based University Physics II	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

To learn more about City Tech's articulation agreement to the BA in Physics at Hunter College see:
<http://www.citytech.cuny.edu/academics/deptsites/physics/research.aspx>

COURSES:

PHYS 1111 Principles of Science I SCI Core

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

PHYS 1112 Principles of Science II SCI Core

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 SCI Core

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

PHYS 1118 Astronomy II: Stars, Galaxies, Cosmology SCI Core

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 1433 Physics 1.2 SCI Core

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 Physics 2.2 SCI Core

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 Physics 1.3 SCI Core

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

PHYS 1442 Physics 2.3

SCI Core

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 Physics 3.3

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, 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 RAD 2326

PHYS 2605 Introduction to Laser Physics and Photonics

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

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 Jean Kubeck, Chair
Namm Hall, room N 611
718.260.5079
email: jkubec@citytech.cuny.edu

FACULTY:

Professors: Derrington, Gerardi, Kaplan, Nalven
Associate Professors: Brand, Catapano, Cuordileone, McDonald, Pagano, Panayotakis, Parides
Assistant Professors: Capruso, Castillo, Hannum, Her, Kao, Kubeck, MacDonald, Parnes, Pope-Fischer, Rodriguez, Sisco, Zylstra

SOCIAL SCIENCE

The department seeks to provide insight into the various social sciences and to inform the student of the social scientist's view of problems which confront the individual, the community, the nation and the world.

A goal of the department is to give the student a clear understanding of the complexity of modern life and of the many demands it makes on each of us. By gaining insight into the social sciences, the student can step with confidence into the responsibilities of citizenship and enhance personal growth in his/her chosen career.

The realization of these objectives will give the student both an increased knowledge and a heightened awareness and understanding of the nations and peoples around us.

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 core curriculum in philosophy, the behavioral and social sciences. 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 are offered in eight specific disciplines: anthropology, economics, geography, history, philosophy, political science, psychology and sociology. The department encourages students to appreciate the close interrelationships between various disciplines within social science.

Students should note that courses numbered 3000 are upper-level courses. In addition to having more extensive prerequisites, more exacting standards of performance are expected of students enrolled in them.

COURSES:

ANTH 1101 Introductory Anthropology BS Core

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, Meso-America, Australia and Asia are presented.
Prerequisite: CUNY proficiency in reading and writing

requirements by students in the AA and AS programs.

ECON 1101 Macroeconomics SS Core

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

ANTH 1102 Comparative Religions BS Core

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

ECON 1401 Microeconomics SS Core

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

ANTH 1103 Contemporary Women: An Interdisciplinary Approach to the Study of the Female

BS Core
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

ECON 2301 Money and Banking SS Core

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

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

ECON 2403 Labor Management Relations SS Core

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

GEOG 1101
Elements of Physical Geography

SS Core

3 cl hrs, 3 cr

The elements of geography which relate to the human habitat; the physical-biotic systems which constitute the natural surroundings of humans; surface features, climate, the seas and natural resources. All elements are interpreted with reference to humanity and world patterns rather than specific areas.
Prerequisite: CUNY proficiency in reading and writing

GOV 1101
American Government

SS Core

3 cl hrs, 3 cr

This course focuses on national political institutions including the presidency, Congress, the judiciary, bureaucracy and political parties. Attention is also given to the U.S. Constitution, civil rights, the relationship between the national government and state governments and selected issues in governmental policy areas.
Prerequisite: CUNY proficiency in reading and writing

GOV 1102
State and Local Government

SS Core

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
Constitutional Law

SS Core

3 cl hrs, 3 cr

The Constitution, the historical development of its major principles and the efforts by the Supreme Court to redefine these principles. Taught using the technique of analyzing case law briefs. The course is divided into two parts. The first part examines the basic framework of constitutional law and the second half applies

that framework to the study of the constitutional protection of civil rights and liberties.

Prerequisite: GOV 1101 or GOV 1102 or LAW 1201

HIS 1101
History of Western Civilization I

SS Core

3 cl hrs, 3 cr

Beginning with the dawn of history, the elements of the Western heritage are traced to the contributions of the ancient civilizations of Egypt, Mesopotamia, Greece and Rome. Attention is given to the rise of monotheistic religions of Judaism, Christianity and Islam, as well as the achievements of Byzantine society. The focus then shifts to Western Europe in the Middle Ages: the Roman Catholic Church, the Carolingians, Feudalism, the Medieval worldview, the Crusades and the crises of the late middle ages. Finally, the context for the Renaissance and the Reformation are introduced as time permits and at the discretion of the instructor.
Prerequisite: CUNY proficiency in reading and writing

HIS 1102
History of Western Civilization II

SS Core

3 cl hrs, 3 cr

This course begins with developments in the early modern era of the West and the historical implications of the Renaissance and Reformation. Attention is given to the religious wars, the Counter-Reformation and the rise of the nation-state. The Scientific Revolution, European colonization of the New World, the Enlightenment and the political and intellectual climate of the 18th century will be discussed along with the American and French Revolutions. The Industrial Revolution and its economic, political, social and technological impact will also be covered. The course concludes with the political and social changes in the post-Napoleonic era including the revolutions of 1848 and the rise of European imperialism in Africa and Asia.

Prerequisite: CUNY proficiency in reading and writing

HIS 1103
History of Western Civilization III

SS Core

3 cl hrs, 3 cr

This course will cover the primary historical events and movements in Western civilization from the First

World War to the present. Specific topics to be discussed include the First World War, the emergence of mass culture, the rise of modernism, the labor and women's rights movements, the interwar crisis and international Depression, the Second World War and Holocaust, European decolonization, the Cold War and resulting "hot wars" from Korea to Vietnam, the disintegration of the Soviet Union and the post-Cold War rise of international terrorist movements.

Prerequisite: CUNY proficiency in reading and writing

HIS 1110
History of the United States to 1877

SS Core

3 cl hrs, 3 cr

A survey of significant developments in American history from colonization through the Civil War. Topics covered include the collision of cultures in the New World and the founding of English colonies, colonial cultures and politics, the rise of slavery, the causes and consequences of the American Revolution, the Republican ideal and the establishment of the U.S. Constitution, westward expansion and frontier life, sectional conflict and the Civil War.

Prerequisite: CUNY proficiency in reading and writing

HIS 1111
History of the United States Since 1865

SS Core

3 cl hrs, 3 cr

This course explores major developments in American history from Reconstruction through modern times. Topics discussed include reconstruction, industrialization, urbanization and immigration, American expansion abroad, two world wars and the rise of the U.S. as a global power, the New Deal and the increasing role of the federal government, the extension of political and civil rights and the domestic and foreign implications of the Cold War from Korea to Vietnam.

Prerequisite: CUNY proficiency in reading and writing

HIS 1201
Contemporary Civilizations and Cultures of Asia

SS Core

3 cl hrs, 3 cr

Traces the history of major cultures of the east and south Asia in the beginning of the 19th century. Regional and international economics, political and social events are treated comprehensively.

Countries covered are China, Japan, India and those in southeast Asia. Emphasis is placed on the results of the interaction between western and Asian ways.

Prerequisite: CUNY proficiency in reading and writing

HIS 1203
English History Survey

SS Core

3 cl hrs, 3 cr

English history from the earliest time to the present, tracing the development of the English as a people and the origins of representative government. Britain's role in world affairs since Napoleon and its response to the erosion of empire and influence in the 20th century.

Prerequisite: CUNY proficiency in reading and writing

HIS 1205
Economic History of the United States

SS Core

3 cl hrs, 3 cr

American economic history from the period of colonization to the present. The influence and interrelationship of agriculture, trade, commerce, the factory system, the banking system, transportation and communication, technology, immigration, labor unions, wars, recessions, depressions and inflation on the American nation. Institutions and how they affected the lives of Americans in the past and present.
Prerequisite: CUNY proficiency in reading and writing

HIS 2000
Modern World History

SS Core

3 cl hrs, 3 cr

An intermediate-level examination of modern world history (circa 1848 to the present) in a global context. By studying the interconnectedness of the various, political, diplomatic, economic, social, and cultural forces that shaped the formation of the modern world, students will gain an understanding of how historical forces and events have shaped today's highly globalized society. Topics covered range from the 19th century race for empire to contemporary debates about globalization. Students will be introduced to different types of historical methodology.
Prerequisite: ENG 1101

HIS 3208
History of Immigration, Ethnicity and Nativism in the United States

SS Core

3 cl hrs, 3 cr

The history of various groups which make the United States a melting pot, how and why these groups arrived in the United States, how they accepted or rejected assimilation into American society, how they coped with the problems that face immigrants as well as major events in American history such as the Civil War, the Great Depression or World War II. In addition, the development of nativism and other manifestations of discrimination and how they affected each group as it attempted to integrate into American society.

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 PRS 1462)

HIS 3209
History of Technology

SS Core

3 cl hrs, 3 cr

This course will cover the history of major technologies from the beginning of humankind to today's most important technologies. The course will begin with the uses of technology by prehistoric peoples. It will then continue with the study of technology in the ancient civilizations of the Mesopotamians, the Egyptians, the Greeks and the Romans. The course will then consider technological development during the Middle Ages and Renaissance. And it will conclude with the study of the Industrial Revolution and its impact on modern society.

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 PRS 1462)

HIS 3402
Global Encounters: Topics in 20th Century World History 1945-2000

SS Core

3 cl hrs, 3 cr

An exploration of selected topics in world history involving the second half of the 20th century: key geopolitical, economic, intellectual, cultural, scientific and/or technological developments that had an impact on the world and led to global encounters between people and nation-states. Students are required to keep abreast of current trends in various parts of the world and be familiar with popular sources of information. Proceeds in

chronological-thematic fashion and taught in seminar format, with guest speakers when appropriate. Organized around specific themes that may vary according to 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 PRS 1462)

PHIL 2101
Introduction to Philosophy

PHIL Core

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

PHIL Core

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

PHIL Core

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; Note: Student may take PHIL 2103 or PHIL 2203 but not both for credit

PHIL 2104
Ancient Philosophy

PHIL Core

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

PHIL Core

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

PHIL Core

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

PHIL Core

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 2120
Philosophy of Art and Beauty

PHIL Core

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

PHIL Core

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

PHIL Core

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; Note: Students may take PHIL 2103 or PHIL 2203 but not both for credit

PHIL 3208
Political Philosophy

PHIL Core

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

PHIL Core

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

PHIL Core

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

PHIL Core

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

PHIL Core

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
PHIL Core**

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
BS Core**

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
BS Core**

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,

maturity 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
BS Core**

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
BS Core**

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
BS Core**

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
BS Core**

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
BS Core**

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
BS Core**

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
BS Core**

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
BS Core**

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**

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
BS Core**

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
BS Core**

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

**SOC 1101
Elements of Sociology
BS Core**

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

BS Core

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

BS Core

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

BS Core

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

BS Core

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: SOC 1101

SOC 2401
Society, Technology and Self

BS Core

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: SOC 1101

SOC 2403
Law and Society

BS Core

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: SOC 1101 or PSY 1101

SOC 3301
The Emerging Global Society

BS Core

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 3402
The Sociology of Social Problems

BS Core

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: SOC 1101, 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

Barbara Grumet, Dean of the School of Professional Studies
Namm Hall, room N 621
718.260.5345
email: bgrumet@citytech.cuny.edu

Delorise Finerson, Assistant to the Dean
email: dfinerson@citytech.cuny.edu

Liza Linton, Secretary
email: llinton@citytech.cuny.edu

Departments:

Business (Accounting and Marketing)	Career and Technology Teacher Education	Dental Hygiene
Health Services Administration	Hospitality Management	Human Services
Law and Paralegal Studies	Nursing	Radiologic Technology and Medical Imaging
Restorative Dentistry	Vision Care Technology	

Degree Programs:

Bachelor of Science (BS)

Career and Technical Teacher Education	Health Services Administration	Human Services
Legal Assistant Studies	Nursing	Technology Teacher Education

Bachelor of Technology (BTech)

Hospitality Management

Associate in Applied Science (AAS)

Accounting	Dental Hygiene	Dental Laboratory Technology
Fashion Marketing	Hospitality Management	Human Services
Legal Assistant Studies	Marketing Management and Sales	Nursing
Ophthalmic Dispensing	Radiologic Technology and Medical Imaging	

Certificate Programs:

Alcohol and Substance Abuse Counseling
Disability Studies

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 Anne Zissu, Chair
Namm Hall, room N 1012
718.260.5773
email: azissu@citytech.cuny.edu

PROGRAMS:

Accounting/AAS
Fashion Marketing/AAS
Marketing Management and Sales/AAS

FACULTY:

Professors: Carroll
Associate Professor: Dixon, Zissu
Assistant Professors: Bernard, Cheng, Iavarone, Iraggi,
Maklan-Zimberg, Reinig, Singh, Zimmerman
Lecturer: Winston

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.

REQUIRED COURSES IN THE MAJOR

		Credit
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 2335	Microcomputer Accounting Applications	1
ACC 2401	Intermediate Accounting II	3
ACC 2411	Cost accounting II	2
BUS 1122	Business Law	3
BUS 2340	Financial Management	4
BUS 2425	Business Management	3
Subtotal		33

ADDITIONAL REQUIRED COURSES

CST 2206	Introduction to Information Systems and Technologies	4
ENG 1101	English Composition I	3
MAT 1272	Statistics	3
MAT 1375 ²	Precalculus	4
COMM1	Communications	3
Subtotal		17

REMAINING CORE REQUIREMENTS¹

BS/SS	Microeconomics (ECON 1401)	3
LAP	Literature/Aesthetics/Philosophy	3
SCI I	Laboratory Science	4
Subtotal		10

TOTAL CREDITS REQUIRED FOR THE DEGREE 60

¹ See page 35 for a detailed explanation of core-required courses and categories.

² Or higher-level math course. Students without the requisite background for MAT 1375 will be required to take MAT 1275 and/or MAT 1175 in preparation. This will increase the number of credits required for the degree by up to eight (8).

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 business. 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.

REQUIRED COURSES IN THE MAJOR		Credits
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 2414	Sales Management	3
Select one of the following two courses for 3 credits:		3
MKT 2300	Direct Marketing and Interactive Marketing	
MKT 2327	Entrepreneurship	
Select one of the following two courses for 3 credits:		3
MKT 2373	Supply Chain Management	
MKT 2410	Marketing Management	
Subtotal		24
ADDITIONAL REQUIRED COURSES		
Select one of the following two courses for 3 or 4 credits:		
ACC 1162	Elements of Accounting	3
ACC 1101	Principles of Accounting I	4
BUS 1122	Business Law	3
BUS 2340	Financial Management	4
BUS 2425	Business Management	3
ENG 1101	English Composition I	3
MAT 1272	Statistics	3
MAT 1375 ²	Precalculus	4
SCI I ¹	Laboratory Science	4
Subtotal		27/28
REMAINING CORE REQUIREMENTS ¹		
BS/SS	Microeconomics (ECON 1401)	3
COMM	Communications	3
LAP	Literature/Aesthetics/Philosophy	3
Subtotal		9
TOTAL CREDITS REQUIRED FOR THE DEGREE		60/61

¹ See page 35 for a detailed explanation of core-required courses and categories.

² Or higher-level math course. Students without the prerequisite background for MAT 1375 will be required to take MAT 1275 and/or MAT 1175 in preparation. This will increase the number of credits required for the degree by up to eight (8).

Associate in Applied Science in FASHION MARKETING

The Fashion Marketing program is 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. Among the employers of graduates are Saks, Macy's, J.C. Penney, ENYCE, the Gap, Bloomingdale's, Dolce & Gabana, Mary Kay Cosmetics, Victoria's Secret and Models.com. Graduates have a history of success in the industry and many advance to higher executive positions. Many continue their education and receive baccalaureate degrees.

Learning Outcomes in Fashion Marketing

The Fashion Marketing program at City Tech will help students learn:

- Theoretical knowledge and practical skills necessary for career success and professional advancement in fashion marketing.
- How to meet the professional employment needs and obtain a career in fields such as fashion merchandising, merchandise planning and control, textiles, and fashion buying.
- Hands-on experience through field trips to fashion markets, showrooms and trade shows that enhance the overall learning experience.
- How to further your college career by transferring to a senior college to acquire a baccalaureate degree.

REQUIRED COURSES IN THE MAJOR		Credits
MKT 1100	Essentials of Marketing	3
MKT 1102	Principles of Selling	3
MKT 1210	Marketing Research	3
MKT 1214	Advertising	3
MKT 1246	Textiles (Spring only)	3
MKT 1255	Merchandising Planning and Control (Fall only)	3
MKT 2300	Direct Marketing and Interactive Marketing	3
MKT 2327	Entrepreneurship	3
MKT 2335	Fashion Merchandising (Fall only)	3
MKT 2401	Fashion Buying (Spring only)	3
Subtotal		30

ADDITIONAL REQUIRED COURSES		Credits
BUS 1122	Business Law	3
BUS 2340	Financial Management	4
BUS 2425	Business Management	3
ENG 1101	English Composition I	3
MAT 1375 ²	Precalculus	4
SCI I ¹	Laboratory Science	4
Subtotal		21

REMAINING CORE REQUIREMENTS ¹		Credits
BS/SS	Microeconomics (ECON 1401)	3
COMM	Communications	3
LAP	Literature/Aesthetics/Philosophy	3
Subtotal		9

TOTAL CREDITS REQUIRED FOR THE DEGREE	Credits
	60

¹ See page 35 for a detailed explanation of core-required courses and categories.

² Or higher-level math course. Students without the requisite background for MAT 1375 will be required to take MAT 1275 and/or MAT 1175 in preparation. This will increase the number of credits required for the degree by up to eight (8).

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 1123
Business Mathematics***3 cl hrs, 3 cr*

Mathematics of business including such topics as percentages, ratio analysis, retail markups and markdowns, inventory valuations, notes and interest, depreciation, present value and annuities.

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: 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 2335
Microcomputer Accounting Applications***2 lab hrs, 1 cr*

An overview of the impact of the computer on accounting procedures and an identification of some of the major differences between manual and computerized accounting systems. Includes comprehensive general ledger procedures, accounts receivable, accounts payable and financial statement preparation. Transaction input, sample problems, laboratory problems and computer-generated output provide hands-on experience.

Prerequisites: ACC 1201, CST 2206

**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

**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 2340
Financial Management***4 cl hrs, 4 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: Eligibility for MAT 1275 or higher

**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 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, MKT 1102; 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, MKT 1102; 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, MKT 1102; Pre- or corequisite: ENG 1101

**MKT 1246
Textiles***(spring only)**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

**MKT 1255
Merchandising Planning and Control***(fall only)**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

**MKT 2300
Direct Marketing 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, MKT 1214

**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 2335
Fashion Merchandising***(fall only)**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.

Prerequisites: MKT 1210, MKT 1214

**MKT 2352
Principles of Supervision***3 cl hrs, 3 cr*

Foundations of supervision, including the role of supervisors in organizational designs and decision-making theory. The major functions of supervision and behavior of individuals, including relationship concerns such as leadership, communication and conflict along with developing strategies for professional growth and development are discussed.

Prerequisite: Completion of 18 MKT credits or department approval required

**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 2401
Fashion Buying***(spring only)**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

**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 Godfrey Nwoke, Chair
Midway Building, room M 201
718.260.5373
email: gnwoke@citytech.cuny.edu

PROGRAMS:

Career and Technical Teacher Education/BS in Ed
Technology Teacher Education/BS in Ed

FACULTY:

Professor: Nwoke
Assistant Professors: Aneke, Roberts, Wilkin

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 and trade 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 and 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 on pages 8, 34. 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 2.5 is required for transfer.

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 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 occupational competency requirement in order to be eligible for graduation. The occupational competency 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.

Program Completion and Certification

Students must receive a grade of "B" or better in each course taken in the major. They must maintain a minimum cumulative grade point average of 2.5 in order to continue in the program beyond 12 credits and enroll in student teaching. 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) Assessment of Teaching Skills-Written Test (ATS-W Secondary).
- Professional Certificate – the Initial Certificate, 45 additional college credits and passing the NYSTCE Liberal Arts and Science Test (LAST).

(See the department chair for further information concerning certification examinations.)

PEDAGOGICAL CORE		Credits
EDU 2510	Orientation to Career and Technical Education	3
EDU 2520	Occupational Analysis and Curriculum Organization	3
EDU 2353	Laboratory Organization and Management of Instruction	3
EDU 2362	Methods of Teaching in Career and Technology Education I	3
EDU 3630	Assessing Student Learning Outcomes	3
EDU 3640	Computers in Education	3
EDU 3650	Mainstreaming in Education	3
EDU 3680	Internship in Career and Technical Education	3
EDU 4600	Professional Development Seminar	2
EDU 4620	Methods of Teaching in Career and Technology Education II	3
EDU 4870	Supervised/Student Teaching in Career and Technology Education	6
Subtotal		35
CONTENT CORE¹		
EDU 3700	Practicum in Occupational Competency: Performance	15
EDU 3720	Practicum in Occupational Competency: Written	15
Subtotal		30
GENERAL EDUCATION CORE²		Credits
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
SPE 1330	Effective Speaking	3
MATH I	MAT 1180	4
MATH II	MAT 1280	4
SCI I	BIO 1101 or CHEM 1110 (health and non-technology careers only) or PHYS 1111 or PHYS 1433 or PHYS 1441 (industrial trade/technology careers only)	4 or 5
SCI II	BIO 1201 or CHEM 1210 (health and non-technology careers only) or PHYS 1112 or PHYS 1434 or PHYS 1442 (trade/technical careers only)	4 or 5
LAP	PHIL 2106 ARTH 1103 Any ENG LIT Core Course	3 3 3

BS/SS	Any Music (AES Core)	3
	Any course from the following: ARTH 1101, ARTH 1106	
	or AFR 1300 series (AES Core)	
	or AFR 2200 series (LIT Core)	
	or PRS 2202 series (LIT Core)	3
	PSY 1101	3
	PSY 2501	
	or EDU 2610	3
	PSY 3502	
	or EDU 3610	3
	SOC 1101	3
	HIS 1101, HIS 1111 (SS Core)	3
	Any course from the following: SOC 2401	
	or SOC 3301	
or SOC 3402		
or STS 3401	3	
Subtotal	58-60	

TOTAL CREDITS REQUIRED FOR THE DEGREE **125**

1 This requirement may be satisfied by possessing an associate degree in a CTE subject area that meets the NYS learning standards in Career and Occupational Studies (CDOS). The associate degree program must include at least 30 semester hours in the occupational subject to be taught. Competency in the content core may also be verified using the written and performance (experienced worker) examinations of the National Occupational Competency Testing Institute (NOCTI), or by any other approved state or national licensing examination. Prospective students expecting to meet the content requirement through occupational competency testing are advised to check with the department chair prior to admission to confirm that a test is available in their specific CTE subject areas. Credit through examination or occupational license is awarded only upon completion of all other degree requirements.

2 See page 35 for a detailed explanation of core-required courses and categories.

The Career and Technical Teacher Education program at New York City College of Technology is accredited by the National Council for Accreditation of Teacher Education (NCATE)

Bachelor of Science in Education in TECHNOLOGY TEACHER EDUCATION

Technology Teacher 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. In technology teacher education, prospective teachers are prepared to develop the knowledge, skills and dispositions required to teach technology education in kindergarten through 12th grade.

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. The master's degree is required for the New York State professional certificate as a technology teacher. Graduates of the 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 in 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.
- **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 (BS in Ed) degree program as freshmen if they meet the general College criteria for baccalaureate admissions found on pages 8, 34. 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 2.5 is required for transfer into the program.

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.

Students currently enrolled in or graduates of programs in the technologies who are interested in pursuing a teaching career are well suited to progression in technology teacher education. Please consult the department chair for further information.

Program Completion and Certification

Students must receive a grade of "B" or better in each course taken in the major. They must maintain a minimum cumulative grade point average of 2.5 in order to continue in the program beyond 12 credits and to enroll in student teaching. 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 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 New York City licensing requirements. Passing the NYSTCE Liberal Arts and Sciences Test (LAST), the Assessment of Teaching Skills-Written (ATS- W) and the Content Specialty Test (CST) is required for certification and licensing. (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.

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 Education Association-Council on Technology Teacher Education (ITEA-CTTE).

PEDAGOGICAL CORE		Credits
EDU 2600	Internship in Classroom Teaching I	1.5
EDU 3410	Technology Education Foundations and Curriculum Development	3
EDU 3600	Internship in Classroom Teaching II	1.5
EDU 2362	Methods of Teaching in Career and Technology Education I	3
EDU 3630	Assessing Student Learning Outcomes	3
EDU 3640	Computers in Education	3
EDU 3650	Mainstreaming in Education	3
EDU 4600	Professional Development Seminar	2
EDU 4620	Methods of Teaching in Career and Technology Education II	3
EDU 4870	Supervised/Student Teaching in Career and Technology Education	6
Subtotal		29
CONTENT CORE (Required Courses)		
EDU 1400	Design and Drafting I	2
EDU 1420	Construction Systems	3
EDU 2400	Design and Drafting II	2
EDU 2410	Survey of Technological Development	3
EDU 2440	Manufacturing Systems	3
EDU 2460	Communications Systems	4
EDU 3400	Technological Systems I	3
EDU 3420	Electronics Systems	4
EDU 3440	Transportation Systems	3
EDU 4480	Principles of Engineering	3
Subtotal		30

ELECTIVES (Select Option A or B)**OPTION A COMPUTER TECHNOLOGY**

Select at least 6 credits from one specialization area:

Programming

CST 1101	Problem Solving with Computer Programming	3
CST 2403	Intro C++ Programming Language I	3
CST 3503	C++ Programming II	3

Networking

MST 1205	Microcomputer Systems	3
MST 2307	Local Area Networks	4
MST 2405	Microcomputer Operating Systems	4

Databases

CST 1101	Problem Solving with Computer Programming	3
MST 1204	Data Base Systems Programming I	3
MST 2304	Data Base Systems Programming II	3

OPTION B TECHNOLOGY SYSTEMS

Select 6 credits from the following:

EDU 4400	Technological Systems II	3
EDU 4420	Energy Systems	3
EDU 4440	Electronic and Robotic Systems	3

Subtotal **6****GENERAL EDUCATION CORE¹**

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
SPE 1330	Effective Speaking	3
MATH I ²	MAT 1275	4
MATH II	MAT 1375	4
SCI I	PHYS 1111 or PHYS 1433 or PHYS 1441	4 or 5
SCI II	PHYS 1112 or PHYS 1434 or PHYS 1442	4 or 5
PHIL 2106		3
ARTH 1103		3
Any ENG LIT Core Course		3
Any MUS (AES Core)		3
Any course from the following: ARTH 1101, ARTH 1106 or AFR 1300 series (AES Core) or AFR 2200 series (LIT Core) or PRS 2202 series (LIT Core)		3
PSY 1101		3
PSY 2501 or EDU 2610		3
PSY 3502 or EDU 3610		3
SOC 1101		3
Any course from the following: HIS 1110, HIS 1111 (SS Core)		3
Any course from the following: SOC 2401 or SOC 3301 or SOC 3402 or STS 3401		3

Subtotal **58-60****TOTAL CREDITS REQUIRED FOR THE DEGREE** **123-125**¹ See page 35 for a detailed explanation of core-required courses and categories.² Students without the requisite math background for MAT 1275 will be required to take MAT**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 4600	Professional Development Seminar	2
EDU 4870	Supervised/Student Teaching in Career and Technology Education	6

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 CreditsChoose one from the following for 3 credits **3**

EDU 2510	Orientation to Career and Technical Education	
EDU 2353	Laboratory Organization and Management of Instruction	
EDU 2520	Occupational Analysis and Current Organization	
EDU 3410	Technology Education Foundations and Curriculum Development	
EDU 3610	Human Learning and Instruction	
EDU 3630	Assessing Student Learning Outcomes	
EDU 3640	Computers in Education	
EDU 3650	Mainstreaming in Education	
EDU 3680	Internship in Career and Technical Education	

TOTAL CREDITS REQUIRED FOR THE CERTIFICATE **12**

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 2353**Laboratory Organization and Management of Instruction**

3 cl hrs, 3 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)

EDU 2362**Methods of Teaching in Career and Technology Education I**

3 cl hrs, 3 cr

Experience and development of teaching skills utilizing lectures, demonstrations, models, exhibits, mock-ups and other methods of instruction. Lesson-planning, use and construction of instructional devices, selection and sequence of subject matter.

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 2600**Internship in Classroom Teaching I**

1 cl hr, 6 field hrs, 1.5 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

EDU 2610 or PSY 2501**Child and Adolescent Development****BS Core**

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 I**

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 EDU/ED 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 3600**Internship in Classroom Teaching II**

1 cl hr, 6 field hrs, 1.5 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

**EDU 3610 or PSY 3502
Human Learning and Instruction****BS Core***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 Career and Technology Education***3 cl hrs, 0 lab hrs, 3 cr*

This course prepares teacher candidates for literacy instruction in career and technology 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, EDU 2610***EDU 3680
Internship in Career and Technical Education***2 cl hrs, 12 field hrs, 3 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 2353, EDU 2362; Corequisite: EDU 4620 or department approval***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, PHYS 1112 or PHYS 1434***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 3600 or EDU 3680, EDU 2362; Corequisite: EDU 4870***EDU 4870
Supervised/Student Teaching in Career and Technology Education***18 field hrs/lwk, 6 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 2610, EDU 3610, EDU 2362, EDU 3680, EDU 4620 and department approval is required one semester in advance; Corequisite: EDU 4600

Dental Hygiene

Professor Joycelyn Dillon, Chair
 Pearl Building, room P 201
 718.260.5070
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PROGRAM:

Dental Hygiene/AAS

FACULTY:

Professor: Friedman

Associate Professors: Archer, Cohen-Brown, Cortell, Dillon, Dreyer, Lam

Assistant Professors: Bilello, Davide, Grill, Mathews, Nilsen-Kupsch
 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 Acts. 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 as of September 2010 and thereafter

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 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 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 22-credit 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 re-admittance 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.....	\$830
N.Y. State License.....	\$120
Malpractice Insurance.....	\$35
Professional Memberships.....	\$120
Instruments and Supplies.....	\$600
Textbooks.....	\$800
Uniforms.....	\$140
Hygiene Pin.....	\$65

PRE-CLINICAL PREREQUISITES

		Credits
BIO 2311	Human Anatomy and Physiology I	4
BIO 2312	Human Anatomy and Physiology II	4
CHEM 1000	Principles of Chemistry	4
ENG 1101	English Composition I	3
MAT 1180	Mathematical Concepts and Applications	4
SOC 1101	Elements of Sociology	3
Subtotal		22

REQUIRED COURSES IN THE MAJOR

		Credits
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
Subtotal		33

ADDITIONAL REQUIRED COURSES

BIO 3302	Microbiology I	4
BIO 3524	Nutrition	2
PSY 1101	Introduction to Psychology	3
And select one of the following two courses for 3 credits:		3
SPE 1330	Effective Speaking or	
SPE 1320	Voice and Diction	
Subtotal		12

TOTAL CREDITS REQUIRED FOR THE DEGREE

67

Note: BIO 1101, Biology I, is a prerequisite course required only of those students lacking an equivalent high school or college biology/laboratory course which would be acceptable as a prerequisite for BIO 2311/BY 301.1. BIO 1101/BY 101 (or equivalent college level BIO/BY course) will be evaluated as the required prerequisite BIO/BY course for those students who have not taken BIO 2311/BY 301.1. For those students who have taken BIO 2311/BY 301.1 without a prerequisite BIO/BY course, BIO 2311/BY 301.1 will be evaluated as the required prerequisite BIO/BY course. Students can be considered for placement into clinical courses after completing BIO 1101/BY 101. Students who begin with this course will complete a minimum of 71 credits for the degree. This course is not counted as part of the prerequisite courses required by the Dental Hygiene department because it is not needed for all students. Determination of whether a student needs it as a prerequisite for taking Anatomy and Physiology 1 will be made by the Biology department.

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; Corequisites: DEN 1112, DEN 1114, BIO 2311

**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; Corequisites: BIO 2311, DEN 1100, DEN 1114

**DEN 1114
Histology and Embryology***(fall only)**1 cl hr, 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.

Corequisites: DEN 1112, BIO 2311

**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, BIO 2312, BIO 3302

**DEN 1217
Periodontics I***(spring only)**1 cl hr, 1 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, BIO 3302

**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, BIO 2312, BIO 3302

**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; Corequisites: DEN 23111, DEN 2315, DEN 2317, 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 1100, DEN 1112, DEN 1114; Corequisites: DEN 1200, DEN 1217, BIO 2312, BIO 3302

**DEN 2315
Pharmacology***(fall only)**2 cl hrs, 2 cr*

Pharmacological action of drugs on functions of the body. Therapeutics of drugs commonly employed in dental practice.

Prerequisites: BIO 2312, BIO 3302; Corequisites: DEN 2300, DEN 2311

**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 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 2317, DEN 2318; Corequisites: DEN 2413, BIO 3524

**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: MAT 1180; Corequisite: DEN 2400

**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, 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 and Human Services

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PROGRAMS:

Human Services/AAS
Human Services/BS
Health Services Administration/BS
Credentialed Alcohol and Substance Abuse Counseling Certificate (CASAC)

FACULTY:

Professors: Ayala, Negrón
Associate Professors: Bonsignore, Garfinkle, Luk, Pawlukewicz
Assistant Professors: Bohm, Cho, Diaz, Ford, Shepard, Thorpe
Instructor: Powell
Lecturer: Rodriguez

HEALTH AND HUMAN SERVICES

The Department of Health and Human Services offers three degree programs. The Associate of 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.

The Bachelor of Science in Health Services Administration is a separate degree for students who have an Associate's degree plus license in a health profession, or who have an Associate's Degree in another discipline plus work experience in the health care industry. This degree prepares students for management positions or graduate school in fields such as health administration, business, law, or health professional school.

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.

Students who complete an associate degree in human services will be able to demonstrate the following:

- Illustrate the human service field from its origins to current practices.
- Implement human service skills such as assessment, intake, treatment planning for individuals, groups, families and communities.
- Practice professional values, ethics and self-awareness within a multicultural and multidisciplinary setting, while incorporating best practices indicated by the Council of Standards for Human Services.
- Complete a community needs assessment, and specify organizational and mobilization efforts for change.
- Utilization and delivery of human services skills successfully through a minimum of 250 hours in an approved community-based internship site.
- Through the general education/core curriculum students will demonstrate critical thinking, scientific and mathematical literacy, humanistic and social inquiry, communication, research and computer skills.

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

REQUIRED COURSES IN THE MAJOR		Credits
HUS 1101	Introduction to Human Services	3
HUS 1201	Elements of Counseling	3
HUS 1202	Community Mental Health	3
HUS 1206	Group Dynamics	3
HUS 1207	Human Services Seminar	1
HUS 2305	Field Practicum I (see Credit by Examination, below)	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 for three (3) credits:		3
HEA 1102	Community Health	or
HEA 2108	Women's Health Issues	
HEA 2110	Human Sexuality	or
HEA 2400	HIV/AIDS for Health Care and Human Services Workers (Recommended for CASAC candidates)	
Subtotal		28

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.

ADDITIONAL REQUIRED COURSES		Credits
ENG 1101	English Composition	3
MAT 1180	Mathematical Concepts and Application	4
BIO 1101	Biology I	4
PSY 1101	Introduction to Psychology	3
SPE 1330	Effective Speaking	3
PSY 2301	Child Psychology	3
SOC 1101	Elements of Sociology	3
Select one of the following two courses for 3 credits:		3
GOV 1101	American Government	or
GOV 1102	State and Local Government	
HUMAN SERVICES URBAN ISSUES ELECTIVE		
Select one urban issues course from the following for three (3) associate credits or 6 in a foreign language (FL):		3/6
AFR or PRS in a 14XX or 15XX series or ANTH 1100 series, or SOC higher than 1101, or two semester sequence of a foreign language. Students electing courses in a foreign language (ARB, ASL, CHN, FREN, SPA) are required to take a one year sequence. The FL will increase the number of credits required for the degree by three (3). Elective must have a minimum of the CUNY proficiency in reading and writing prerequisite.		
HUMAN SERVICES LITERATURE ELECTIVE		
Select any English Literature Core course for 3 credits:		3
Literature	Any ENG, AFR 2200 series or PRS 2200 series	
Subtotal		32
TOTAL CREDITS REQUIRED FOR THE DEGREE¹		60-63
<i>1 AFR 1331, AFR 1332; PRS 1551 and PER 1120, PER 1128, PER 1130, PER 1131 and PER 1134 are not accepted for this degree.</i>		
<i>Note: In compliance with the College computer literacy requirement, HUS students are required to demonstrate computer literacy by completion of a computer literacy certificate through a self-paced process available at no cost in the Atrium Learning Center. If students choose to satisfy the requirement by completing MST 1101, this will raise the number of credits required for the degree by three (3) to 63. Students should complete this requirement by the end of their second semester. Transfer students should demonstrate computer literacy through coursework or examination by the end of their first semester.</i>		

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.

Students who complete the bachelor's degree in human services will be able to demonstrate the following:

- Illustrate the elements of grant writing and other funding resources for community-based agencies.
- Completion of 20 hours of volunteer work and design a model of a volunteer program for human services.
- Demonstrate knowledge of physical and mental health practices with specific vulnerable populations.
- Identify current research in the field of human services and design a research project.
- Utilization and delivery of advanced human services skills successfully through a minimum of 400 hours in an approved community-based internship site, which includes an assessment of an agency, followed by an implementation of a change project.
- Demonstrate through the General Education/Core Curriculum, critical thinking, scientific and mathematical literacy, humanistic and social inquiry, communication, research and computer skills.

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, volunteerism, grants, funding, volunteerism and research as well as the health and counseling of specific populations including gerontology, disabilities, addictions, 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. See page 35 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.

REQUIRED COURSES IN THE MAJOR		Credits
AAS Degree		60
UPPER-DIVISION COURSES IN THE MAJOR		Credits
HUS 3501	Counseling Methods	3
HUS 3503	Case Management	3
HUS 3504	Group Work Practice	3
Select one of the following HUS/HEA 35XX courses for 3 credits:		
HEA 3502	Drugs and Personal Health	3
or		
HEA 3505	Health Issues of Children and Adolescents	3
or		
HEA 3508	Health and Mental Health Issues with Vulnerable Populations Across the Life Span	3
or		
HUS 3510	Social Welfare Policy and Program	3
Select one of the following HUS/HEA 36XX courses for 3 credits: (These courses are a corequisite with HUS 4701 Internship I)		
HUS 3602	Alcohol and Substance Abuse Treatment	3
or		
HUS 3605	Child Welfare and Family Services	3
or		
HUS 3620	Supervision in Human Services	3
or		
HUS 3608	Human Services Practice with Vulnerable Populations Across the Life Span	3
or		
HUS 3609	Human Services and the Criminal Justice System	3
HUS 3610	Research Methods in Human Services	3
HUS 4701	Professional Internship I	4
HUS 4801	Professional Internship II	4
Subtotal		26

Select one of the following Sequences: Sequences can not be altered

A. General Sequence

HUS 4802	Volunteerism	2
HUS 4803	Resource Development in Human Services	3
HUS 4804	Management Concepts in Human Services	3
Subtotal		8

B. Administration Sequence

HUS 4803	Resource Development in Human Services	3
HUS 4804	Management Concepts in Human Services	3
HUS 4810	Strategic Planning and Reformation within the Human Services Organization	3
Subtotal		9

C. Substance Abuse Sequence

HUS 3606	Assessment, Evaluation and Treatment for Alcohol and Substance Abusing Clients	3
HUS 3607	Strategies and Interventions with Alcohol and Substance Abusing Populations	3
HUS 3611	Ethical and Professional Responsibilities for Human Services Workers	3
Subtotal		9

ADDITIONAL REQUIRED COURSES

MAT 1272	Statistics	3
SCI II	BIO 1201	4
SCI III	BIO 2312	4
ENG 1121	English Composition	
AES	Any ARTH, MUS, THE, AFR 1300 series	3
PHIL	PHIL 2101 or PHIL 2103 or PHIL 2203	3
PSY ¹	PSY 2302, PSY 2303, PSY 2401, PSY 2402, PSY 2403	3
AFR/PRS	in a 14XX or 15XX series	3
Subtotal		26

TOTAL CREDITS REQUIRED FOR THE DEGREE¹ 120-121

¹ AFR 1331, AFR 1332; PRS 1551 and PER 1120, PER 1128, PER 1130, PER 1131 and PER 1134 are not accepted for this degree.

Note: See catalogue page 35 for a detailed explanation of core-required courses and categories.

Bachelor of Science in HEALTH SERVICES ADMINISTRATION

The Bachelor of Science (BS) in Health Services Administration 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 Health Services Administration program offers an upper-level interdisciplinary 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", which 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:

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.

Prerequisites for entering the program are an appropriate associate degree and licensure or certification in a clinical health science discipline, with a minimum grade point average of 2.5.

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 2.5 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.

REQUIRED COURSES IN THE MAJOR		Credits
Associate-level Courses in Discipline and Upper-level Professional Electives ¹		42
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 Management Accounting	3
HSA 4620	Health Care Info Systems	3
HSA 4740	Health Research Methods	3
Subtotal		60
ADDITIONAL REQUIRED COURSES		
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
SCI I and II ²	Science	8
MATH I and II ²	Mathematics	7/8
PHIL 2203	Health Care Ethics	3
PSY 1101	Introduction to Psychology	3
SPE ³	Speech	3
LAP ³	Literature/Aesthetics/Philosophy	3
LIT ³	Literature	3
PSY 2404	Personnel and Organizational Psychology	3
ECON 1101	Macroeconomics	3
ECON 2403	Labor Management Relations	3
Electives and Required Associate Degree Courses in Arts and Science ²		15
Subtotal		60/61
TOTAL CREDITS REQUIRED FOR THE DEGREE		120/121

¹ 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.

² With approval of program coordinator.

³ See page 35 for a detailed explanation of core-required courses and categories.

CASAC STUDIES PROGRAM**(Certified Alcohol and Substance Abuse Counselor NY State Education Hours)****CASAC-NYS Certified Alcohol and Substance Abuse Counselor**

The NY State Office of Alcoholism and Substance Abuse Services (OASAS) governs and administers the CASAC written and oral exams. In order to take CASAC tests, the student must have a minimum of 350 education hours in specific areas and in 3 years full-time employment as a substance abuse counselor in an approved OASAS agency. If the candidate obtains a bachelor's degree in human services, then the employment requirement is reduced to two years. New York City College of Technology is a certified OASAS training provider. It is recommended that students review the OASAS CASAC and CASAC In-Training requirements at <http://www.oasas.state.ny.us/sqa/credentialing/CASACreq.cfm#education> prior to applying to the College.

OPTIONS TO OBTAIN CASAC EDUCATIONAL HOURS:**1. Candidates Employed as Substance Abuse Counselors:**

The CASAC program at City Tech is intended for those who are working or have worked in the substance abuse field as counselors for 6000 hours, have the equivalent of 3 years of full-time employment, and have not earned a degree in human services and are not students of the Human Services Department. The 27-credit course of study meets the OASAS educational requirements. Courses are completed on Saturdays over a period of approximately 18 months. The credits can then be applied to the baccalaureate degree in human services with formal application to NYCCT Admissions Office. CASAC enrollment requires proficiency in reading and writing on the CUNY skill assessment test and the TABE. Scholarships may be available. Contact the Continuing Education Department at 718.552.1157 for a CASAC Credit-Bearing Application. Also, workers may be eligible for the CASAC In-Training Certification by reviewing the NY State OASAS website.

2. Non-Substance Abuse Counselors

For those who are not working as practitioners in the field of substance abuse, it is recommended that they formally apply to the human services degree program at City Tech through the Admissions Office, the Namm Building, room N/G 15 at 718.260.5250. Students can then opt to take courses towards their degree and a portion of the required CASAC educational hours simultaneously. Human services-related courses, as well as a documented 4000 hours of work history, can be applied to OASAS for CASAC test application approval or CASAC in-training status.

3. CASAC In-Training Certificate/All Certificate and HUS Majors:

Students may also be eligible for a CASAC In-Training Certificate from OASAS prior to completing a certificate or degree. CASAC potential applicants will be approved by OASAS for the CASAC

In-Training Certificate if they have completed:

- a) 350 hours of required education hours or
- b) a minimum of 4000 hours (2 yr f/t) work experience as a substance abuse counselor AND 85 hours of specific training.

This certificate is valid for only 5 years since it is expected that the candidate will complete the remaining CASAC requirements within that time period. Contact OASAS for more information.

4. Non-Credit Bearing Workshops

Candidates who have a human services-related degree, a CASAC, or need general Non-Credit Bearing CASAC Hours can apply to City Tech's Continuing Education Department. These courses can also be used towards the 2 yr/40 hr OASAS re-credentiaing requirement. Call Continuing Education Department at 718.552.1157 and request a brochure on the non-credit bearing CASAC Workshops.

REQUIRED COURSES FOR THE CERTIFICATE		Credits
	Bridge Seminar (Introduction to College Writing Skills)	0
HUS 1201	Elements of Counseling	3
HUS 1206	Group Dynamics	3
HEA 2400	HIV/AIDS for Health Care and Human Services	3
HEA 3502	Drugs and Personal Health	3
HUS 3503	Case Management	3
HUS 3602	Alcohol and Substance Abuse Treatment	3
HUS 3606	Assessment, Evaluation and Treatment Planning for Alcohol and Substance Abusing Populations	3
HUS 3607	Strategies and Interventions with Alcohol and Substance Abusing Populations	3
HUS 3611	Ethical and Professional Responsibilities for Human Service Workers and Chemical Dependency Professionals	3
TOTAL CREDITS REQUIRED		27

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 2108 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: ENG 1101

HEA 2110 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: ENG 1101

HEA 2400 HIV/AIDS for Health Care and Human Services Workers

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: ENG 1101

HEA 3502 Drugs and Personal Health: Their Use and Abuse

3 cl hrs, 3 cr

(for human services students only) 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

Prerequisite: 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.

Prerequisite: HUS 2405

HEA 3508 Health and Mental Health Issues With Vulnerable Populations Across the Life Span

3cl 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.

Prerequisite: 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.

Prerequisite: 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.

Prerequisites: HUS 1101, PSY 1101, ENG 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.

Prerequisites: HUS 1101, ENG 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.

Prerequisites: HUS 1101, PSY 1101, ENG 1101

**HUS 1207
 Human Services Seminar**

2 cl hrs, 1 cr

Integration of professional ethics, values and skills into practice including specific human services career-related skills, populations, resume and HUS employment options.

Prerequisites: HUS 1101, ENG 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 for HUS 1101, HUS 1201, HUS 1202, HUS 1206, HUS 1207, SOC 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

**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.

Prerequisites: HUS 2405 and 6 credits in psychology

**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.

Prerequisite: 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.

Prerequisite: 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.

Prerequisite: HUS 2405; Corequisite HEA 3502

**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.

Prerequisite: HUS 2405; Corequisite: HEA 3505

**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.
Prerequisite: HUS 2405; Corequisite: HEA 3508

**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.

Prerequisites: HUS 3501, HUS 3503, HUS 3504; *Pre- or corequisites:* Any HEA 3500 course

**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 4701
Professional Internship I**

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 4701. Policies and procedures are stated in the Professional Internship Performance Standard Manual. *Prerequisites:* GPA of 2.0 or better, HUS 3501, HUS 3503, HUS 3504 and one HUS concentration course: HUS 3602 or HUS 3603 or HUS 3604 or HUS 3605 and the corresponding health course: HEA 3502 or HEA 3503 or HEA 3504 or HEA 3505

**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 better, HUS 4701

**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.

Prerequisites: HUS 2405, HUS 3501, HUS 3504

**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.

Prerequisites: HUS 3501, HUS 3503, HUS 3504, ENG 1121

**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 4701

**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

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, MAT 1175 or MAT 1180

**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.

Prerequisites: HSA 3510, computer literacy or MST 1101

**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.

Prerequisite: HSA 3602

**HSA 4900
Health Services Internship**

1 cl 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 3620 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

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:

Professor: Hoffman, Jordan
Associate Professors: Claude, Schaible
Assistant Professors: Akana, Dias, Goodlad, Hellermann, O'Halloran,
Mehrotra, Phillip, Reid, Stewart, Van Loon
Lecturers: Harris, Lewin-Jacus, Lifrieri-Lowry, Merrill

Senior CLT: Pernick
CLTs: Couture, 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:

- Demonstrate basic technical and managerial skills through a comprehensive applied management curriculum offerings of hotel management, culinary and pastry arts and food and beverage management while integrating elements of liberal arts.
- Demonstrate proficiency in the basic vocabulary, concepts and tools of the hospitality industry.
- Develop the necessary communication and critical thinking skills for successful careers.
- Acquire an understanding of social responsibility through involvement in community service.

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 a tremendous 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 enriching opportunities include:

The Anna Nurse Culinary Workshop Series

Each semester, students have a unique opportunity to participate in a series of culinary demonstrations. Current industry professionals, many of whom are alumni, share their expertise with hospitality management students, so that trends are explored and highlighted.

Hospitality Management Lecture Series

Each semester, students have a unique opportunity to participate in a series highlighting current trends in the industry. Renowned industry professionals, collaborate with student leaders to produce relevant topic-driven seminars.

The Food and Wine Club

Each semester, students participate in a series of tastings, lectures and professional workshops.

The American Culinary Federation, Big Apple Junior Chapter (ACF)

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 such as Cooks in the Market and holiday meal preparation for community-based organizations.

Spoons Across America Club

Student members volunteer in NYC public elementary schools and greenmarkets to support experiential food and nutrition initiatives.

'A Day In The Life' Alumni Initiative

Hospitality management alumni offer hospitality management students the opportunity to spend a day working with them. At the job site, students use the first-hand exposure to gain knowledge and an understanding of the necessary skills. Students interview alumni who share the process of successfully navigating their chosen career path.

The Thomas Ahrens International Programs

The department offers two popular international programs; students in both degree programs are encouraged to apply. Participating students must have valid passports and, in some cases, visas.

• 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. All requirements are detailed in a required meeting each February.

• 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. With the generous support of the NYCCT Foundation and industry associations including Société Culinaire Philanthropique de New York, Inc., Paris Gourmet and US Chef's Ski Club, students receive a stipend.

The Walt Disney World College Program

The department is a designated recruitment site for the internationally respected work/study program presented by Disney. 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 any 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	\$1,200
Supplies	\$200
Duplicating Expenses	\$75
Professional Memberships	\$100
Periodicals	\$50
Trade Show Admission	\$50
Hotel/Restaurant Visits (including meals)	\$100

Students are required to purchase professional uniforms and tools, as specified by the department.

REQUIRED COURSES IN THE MAJOR		Credits
HMGT 1101	Perspectives in Hospitality Management	3
HMGT 1102	Introduction to Food and Beverage Management	3
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 2306	Professional Alliances	1
HMGT 2402	Wines and Beverage Management	3
HMGT 2405	Hospitality Marketing	3
Subtotal		37

ADDITIONAL REQUIRED COURSES

ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
ECON 1101	Macroeconomics	3
MAT 1180	Mathematics	4
SCI I ¹	Laboratory Science	4
LAP ¹	Literature/Aesthetics/Philosophy	3
SPE 1330	Effective Speaking	3
Subtotal		23

TOTAL CREDITS REQUIRED FOR THE DEGREE 60

1 See page 35 for a detailed explanation of core-required courses and categories.

Bachelor of Technology in HOSPITALITY MANAGEMENT

Baccalaureate-level coursework builds on the AAS foundation and offers the tools for professional advancement. Electives allow students to choose an area of focus and explore the multi-faceted world of hospitality management. The BTech degree in hospitality management is an accredited program of the Accreditation Commission for Programs in Hospitality Administration (ACPHA). Students completing the baccalaureate degree will:

- Demonstrate enhanced technical and managerial skills within the diverse curriculum offerings of
 - Hotel and Resort Management
 - Culinary Arts, Pastry Arts
 - Travel and Tourism
 - Food and Beverage Management
 - Career and Technology Teacher Education
- Develop an expertise within the hospitality management curriculum that will be further enhanced by courses in the College's diverse liberal arts.
- Research, analyze and evaluate industry changes and trends incorporating local, national and global perspectives.
- Evaluate various service enterprises and the relationship between human resources management and the achievement of organizational objectives within the hospitality and services industries.
- Synthesize knowledge, teamwork, interpersonal skills and an appreciation of both classroom and workplace diversity – crucial to managing and succeeding in today's global marketplace.

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 and general managers. 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).

REQUIRED COURSES IN THE MAJOR		Credits
AAS Degree in Hospitality Management		60
UPPER-LEVEL REQUIRED COURSES IN THE MAJOR		Credits
HMGT 3501	Hospitality Workforce Management in a Global Marketplace	3
HMGT 3502	Hospitality Management Research Seminar	3
HMGT 3601	Hospitality Legal Environment	3
HMGT 3602	Hospitality Management Accounting and Finance	3
HMGT 4702	Hospitality Services Marketing and Management	3
HMGT 4802	Hospitality Internship	3
Subtotal		18
ELECTIVE COURSES		
Select 12 credits from one or a combination of the following:		
Area of Focus		
HMGT 4950 series	Hotel and Resort Management	
HMGT 4960/4970 series	Culinary Arts and Pastry Arts	
HMGT 4980 series	Travel and Tourism	
HMGT 4990 series	Food and Beverage Management	
EDU series ²	Career and Technical Teacher Education	
Subtotal		12
OTHER ELECTIVE COURSES		
Area of interest or EDU series ²		11-14
ADDITIONAL REQUIRED COURSES		
MAT 1272	Statistics	3
SCI II ¹	Laboratory Science (one year sequence)	4
LIT ¹	Literature	3
LAP ¹	Literature/Aesthetics/Philosophy	3
BS/SS ¹	Behavioral Science/Social Science	3
BS/SS ¹	Behavioral Science/Social Science (advanced)	3
Subtotal		19
TOTAL CREDITS REQUIRED FOR THE DEGREE²		120-126

¹ For those entering the program with other credentials, please consult with the department about both transferable credit and degree requirements.

² EDU series is 26 CTE credits from the Area of Focus and other Elective Courses: 126 credits for HMGT BTECH.

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 0605*

HMGT 1102 Introduction to Food and Beverage Management

3 cl hrs, 3 cr

A three-part foundation for food and beverage management, focusing on sanitation, culinary math and procurement methods. A systems approach to sanitation management principles of serving safe, provides students with the opportunity to obtain nationally recognized ServSafe® certification. 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 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 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 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

**HMGT 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: HMGT 1202, HMGT 1204

**HMGT 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: HMGT 1105, HMGT 1202

**HMGT 2306
Professional Alliances***1 cl hr, 1 cr*

The essential role of networking in the hospitality industry is explored. Membership participation in a professional organization is required. Recognition and development of professional relationships in relation to individual career development and goals.

Prerequisites: HMGT 1105, HMGT 1202

**HMGT 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: HMGT 2302, HMGT 2303, HMGT 2304

**HMGT 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: HMGT 2302, HMGT 2303, HMGT 2304

**HMGT 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: HMGT 2302, HMGT 2303, HMGT 2304, HMGT 2305 or AAS degree in Travel and Tourism or Hospitality Management

**HMGT 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 data bases. 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: HMGT 2302, HMGT 2303, HMGT 2304, HMGT 2305 or AAS degree in Travel and Tourism or Hospitality Management

**HMGT 3601
Hospitality Management Legal Environment***3 cl 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: HMGT 2302, HMGT 2303, HMGT 2304, HMGT 2305

**HMGT 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: HMGT 2302

**HMGT 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: HMGT 3501, HMGT 3502, HMGT 3602

**HMGT 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: HMGT 3501, HMGT 3502, HMGT 3602

HOTEL AND RESORT MANAGEMENT**HMGT 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

**HMGT 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: HMGT 3501, HMGT 3502, HMGT 3602; *Pre- or corequisite:* HMGT 4702

HMGT 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*

HMGT 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*

HMGT 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*

HMGT 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

HMGT 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: HMGT 2303

HMGT 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: HMGT 2303

HMGT 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: HMGT 2303

HMGT 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: HMGT 4961 or HMGT 4965

HMGT 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: HMGT 2304

HMGT 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: HMGT 2304

HMGT 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: HMGT 2304

HMGT 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: HMGT 2304

HMGT 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: HMGT 2304

HMGT 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: HMGT 2304

TRAVEL AND TOURISM

HMGT 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*

HMGT 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 4985 Conference, Meetings and Business Travel Planning

3 cl hrs, 3 cr

This course examines the planning, operations and management of conferences, meetings and business travel, referred to as the meetings industry. The role of the planner/manager including setting objectives, program design, budgeting, evaluating Requests for Proposals, the site selection, negotiations, contracts, logistics, transportation, security, legal and other issues will be discussed. The uses of technology in budgeting, content and security will also be examined.

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

HMG 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

HMG 4991 Restaurant Management

2 cl hrs, 2 cr

History, current and future direction of restaurant management. Operations, marketing and personnel management as they affect community and marketplace trends.

Prerequisite: AAS degree in Travel and Tourism or Hospitality Management

HMG 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: HMG 2303

HMG 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: HMG 2303

HMG 4994 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.

Prerequisite: AAS degree in Travel and Tourism or Hospitality Management

HMG 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: HMG 2402

HMG 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: HMG 2402

HMG 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: HMG 2402

HMG 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

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-Sanchez

Distinguished Lecturer: Schechter

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 an understanding of substantive and procedural law and the practical skills 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 have the approval of 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 premier 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:

- Identify the roles and responsibilities of paralegals in the legal system
- Define and use common legal terminology
- Explain the basic principles of the American common law system including the structures and jurisdiction of the federal and New York court systems
- Explain the ethical responsibilities of attorneys and paralegals
- Draft basic legal documents
- Conduct basic legal research in a law library and online
- Communicate effectively in writing and orally
- Use a computer as required in law offices
- Perform the duties of a paralegal in five substantive areas of law

REQUIRED COURSES IN THE MAJOR

		Credits
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 2304	Legal Research II	3
LAW 2403	Legal Document Preparation	3
LAW 2409	Legal Internship and Seminar I	4
Select one of the following three courses for 3 credits:		3
LAW 2302	Business Organization and Commercial Law	
LAW 2405	Torts and Insurance Law	
LAW 2406	Criminal Law	

Subtotal

31

ADDITIONAL REQUIRED COURSES		Credits
ACC 1162	Elements of Accounting	3
ENG 1101 ³	English Composition I	3
ENG 1121	English Composition II	3
ENG 3771	Advanced Career Writing	3
MATH I ¹	Mathematics	4
PHIL 2101	Introduction to Philosophy	3
PSY 1101	Introduction to Psychology	3
SCI I ²	Laboratory Science	4
SPE 1330	Effective Speaking	3
Subtotal		29
TOTAL CREDITS REQUIRED FOR THE DEGREE		60

1 Students may satisfy the math requirement with either MAT 1180 or MAT 1275. A student who chooses the latter and lacks the requisite background for the course may need to complete MAT 1175, adding four (4) credits to the number required to complete the degree.

2 See page 35 for a detailed explanation of core-required courses and categories.

3 Associate in Arts degree students must complete ENG 1101 with a C or better to graduate.

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, with 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 on pages 8, 34. 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. 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)

Program Goals: Graduates with a baccalaureate degree in paralegal studies should be able to:

- Perform the duties of a paralegal in at least ten substantive areas of law
- Think critically to analyze situations, evaluate information, solve problems and make decisions
- Organize complex data
- Conduct advanced legal research in a law library and online
- Communicate clearly and concisely in writing and orally using appropriate disciplinary conventions
- Identify, evaluate and effectively respond to ethical issues that commonly occur in the law
- Be lifelong learners with the ability to adapt and prosper through constant change and professional evolution
- Respect cultural diversity and possess the social skills necessary to thrive in a multicultural environment

ASSOCIATE DEGREE PREPARATION		Credits
Professional Courses		31
Other Required Courses for AAS Degree		29
Subtotal		60
REQUIRED COURSES IN THE MAJOR		Credits
LAW 4704	Legal Technology	3
*LAW 3500 series	Legal Modules (one set of three)	3
Select one of the following two courses for 3 credits:		3
LAW 4800	Advanced Legal Research	
or		
LAW 4801	Internship and Seminar II	
LAW 4900	Senior Legal Seminar	3
Select five of the following nine courses for 15 credits:		15
LAW 3601	Taxation	
LAW 3602	Trial Preparation	
LAW 3604	Employment and Labor Law	
LAW 3805	Forensic Science and the Legal Process	
LAW 4701	Law Office Management	
LAW 4702	Bankruptcy	
LAW 4703	Immigration	
LAW 4705	Administrative Law	
LAW 4802	Trademark, Copyright, Patent	
*LAW 3500 series	Legal Modules (one set of three)	3
<i>* A set of modules in addition to the required set may be applied toward the five Law electives.</i>		
Subtotal		27

ADDITIONAL REQUIRED COURSES

ENG 1161	Language and Thinking or LIT	3
ENG 3401	Law Through Literature	3
GOV 2401	Constitutional Law or	
SOC 2403	Law and Society	3
MAT 1272	Statistics I or	
MAT 1372	Statistics with Probability	3
PHIL 3211	Philosophy of Law	3
SPE 1340	Oral Interpretation of Literature	3
PSY/PS ¹	Psychology: Any 2000 series or higher	3
SCI III ¹	Laboratory Science II (one year sequence)	4

ELECTIVES

HIS ELECT	Any HIS or AFR 1461, 1465, 1466, 1467, PRS 1462 series	3
FREE ELECTIVES	Areas of Interest (in any subject area including Law)	5

Subtotal **33**

TOTAL CREDITS REQUIRED FOR THE DEGREE **120**

¹ See page 35 for a detailed explanation of core-required courses and categories

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 2304
Legal Research II**

3 cl hrs, 3 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 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 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 Paralegalism, LAW 1103 Civil Law and Procedure, LAW 1201 and LAW 1304 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 2304

**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 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 singleparent 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 profitsharing 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 US 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 US 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 departmental 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 Carmel Dato, Chair
 Pearl Building, room P 505
 718.260.5660
 email: cdato@citytech.cuny.edu

Professor Margaret Rafferty, Coordinator, BS Program
 Pearl Building, room P 510B
 718.260.5620
 email: mrafferty@citytech.cuny.edu

PROGRAMS:

Nursing/AAS
 Nursing/BS

FACULTY:

Associate Professors: Cholewka, Dato, McGirr, Okumakpeyi, Rafferty
Assistant Professors: Curran, Dopwell, Egues, Falk, Gellar, Keane, Kontzamanis, Leinung, Maley, McGibbon, McManus, Rivera, Santisteban, Shockness, Thomas, Waddy
Lecturer: Forbes

Senior CLT: Li
CLT: Mantych

Accreditation

The Associate in Applied Science and the Bachelor of Science programs are accredited by the National League for Nursing Accrediting Commission and registered with the New York State Education Department.

National League for Nursing Accrediting Commission (NLNAC),
 3343 Peachtree Road NE, Suit 500
 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 CityTech, 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 Student Support Services office (SSS), 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 longterm 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).

Introductory Term Requirements

Prior to clinical nursing coursework, all students must complete the 14-credit introductory sequence, with a minimum cumulative index (grade point average) of 2.5 in the following courses:

BIO 2311	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 1275 or higher	Introduction to Mathematical Analysis	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 Kaplan Nursing Admissions 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 Kaplan exam within (5) five years of their application to the clinical phase of the Nursing program. They must submit written applications that include the Kaplan Nursing Admissions Examination results directly to the Department of Nursing.

Prior to the first clinical laboratory experience, at a date specified by the program, students must present proof of professional liability insurance coverage, 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.

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.

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.

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.

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*	Dependent on coverage
Hepatitis B Vaccine is recommended.....	Provided at no cost by CUNY
CPR Certification with AED.....	\$65
Uniform with emblem, scrubs, shoes, scissors, watch, stethoscope.....	\$250
Professional Liability Insurance (annual).....	\$30
Nursing Textbooks.....	\$1100
PDA with e-books.....	\$475
Licensure Fee (NCLEX-RN).....	\$343
Standardized Exams.....	\$450

* The College's Student Health Services Center (SHSC) may be able to provide the physical examination based upon availability of appointments. (Pearl Building, room 104, 718.260.5910)

NURSING DEPARTMENT REQUIREMENTS

The College will grant an Associate in Applied Science (AAS) degree with a major in nursing upon satisfactory completion of the required 67 credits listed below.

REQUIRED COURSES IN THE MAJOR		Credits
NUR 1010 ¹	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
Subtotal		36

ADDITIONAL REQUIRED COURSES

BIO 2311 ¹	Anatomy and Physiology I	4
BIO 2312	Anatomy and Physiology II	4
BIO 3302	Microbiology	4
ENG 1101	English Composition	3
ENG 1121	English Composition II	3
MAT 1275 ² or higher	College Algebra and Trigonometry	4
PSY 1101	Introduction to Psychology	3
PSY 2301	Child Psychology	3
SOC 1101	Elements of Sociology	3
Subtotal		31

TOTAL CREDITS REQUIRED FOR THE DEGREE 67

¹ Students without the requisite science background for BIO 2311 will be required to take BIO 1101 in preparation. This will increase the total number of credits required for the degree by four (4).

² Students without the requisite math background for MAT 1275 will be required to take MAT 1175 in preparation. This will increase the number of credits required for the degree by four (4).

CURRICULUM PLAN**Credits****FIRST YEAR****First Semester or Introductory Term¹**

BIO 2311	Anatomy and Physiology I	4
ENG 1101	English Composition I	3
PSY 1101	Introduction to Psychology	3
MAT 1275 or higher	College Algebra and Trigonometry	4
Subtotal		14

Second Semester or Term

NUR 1010	Medication Calculations in Nursing	1
NUR 1030	Foundations of Caring (WI ²)	6
BIO 2312	Anatomy and Physiology II	4
PSY 2301	Child Psychology	3
Subtotal		14

SECOND YEAR**First Semester or Term**

NUR 1110	Caring for Clients with Common Alterations in Functional Needs	5
NUR 1130	Caring for Clients with Common Alterations in Survival Needs	5
BIO 3302	Microbiology	4
Subtotal		14

Second Semester or Term

NUR 2110	Caring for Clients with Complex Alterations in Survival and Functional Needs (WI2)	5
NUR 2130	Caring for Clients with Alterations in Integrative Needs	4
ENG 1121	English Composition II ³	3
Subtotal		12

THIRD YEAR**First Semester or Term**

NUR 2210	Caring for Clients with Chronic Alterations in Human Needs	5
NUR 2230	Caring for Clients and Families with Growth Seeking Needs	5
SOC 1101	Elements of Sociology	3
Subtotal		13

TOTAL CREDITS REQUIRED FOR THE DEGREE 67

¹ These courses must be completed successfully before taking any nursing courses. Computer literacy is required for graduation. A self-paced process of certification is available through the College Learning Center at no cost to the student or MST 1101 (3 credit course can be taken), in addition to the 67 credits for the AAS in Nursing.

² WI=Writing Intensive

³ See page 35 for a detailed explanation of core-required courses and categories.

Note: NUR courses require permission of the department for registration.

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, within a single day of the week, 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 (ACE) 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, on-line, 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

Applicants for a Bachelor of Science degree with a major in nursing must be graduates of a degree-granting college or a diploma-granting nursing school that prepares students for licensure as Registered Professional Nurses.

Graduates from degree-granting associate degree programs who are candidates for admission to the baccalaureate program in nursing at New York City College of Technology must have:

- Met the admission requirements for the College.
- Graduated from an Associate Degree Nursing program accredited by the National League for Nursing Accrediting Commission.
- A current license in New York State as a Registered Professional Nurse or eligibility to sit for the NCLEX-RN Exam. Students must be licensed prior to registration in a nursing course with a clinical component.
- A 2.5 cumulative grade point average (GPA) on a 4-point scale.

Students applying to the program will be admitted based on space availability.

In addition to the above admission criteria, candidates for admission to the program who hold a diploma or an associate degree in nursing that is not from an institution granting college credit may be admitted to the program by meeting the following requirements:

- Successful completion of the Nursing Acceleration Challenge Exams (ACE) II RN to BS (NLN NACE II Examinations formerly called the NLN Mobility Profile Exams that were used for Nursing Progression). These tests designed for RN/BS programs are \$55 each. The examinations are:
 1. NACE II – Care of the Adult Client (219 items).
 2. NACE II – Care of the Client During Childbearing and Care of the Child (203 items, two exams in one).
 3. NACE II – Care of the Client with a Mental Disorder (132 items).
- Successful completion of all pre-major requirements in the nursing program, either by examination or by completion of the appropriate courses.

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).

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:

- Proof of professional liability insurance coverage.
- CPR Certification with AED.
- A physical examination utilizing the Nursing Department form, which must be updated annually to meet health care facility and Nursing Department requirements.
- A current license in New York State as a Registered Professional Nurse.

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.
- All students entering the BS program from schools other than NYC College of Technology must show proof of completion of a college-level computer course OR must complete the College Learning Center's Self-Paced Computer Literacy program by the end of the first semester in the BS program. A copy of the Certificate of Completion, granted by the Learning Center, must be submitted by the student to the program secretary for inclusion in the student's file.

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.

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.

Part-time students are expected to complete the requirements for the degree in five years.

DEGREE REQUIREMENTS

A minimum of 120 credits is required for the BS degree. 60 credits must be in liberal arts and science courses.

REQUIRED COURSES IN THE MAJOR

AAS Degree **Credits**
60

UPPER LEVEL REQUIRED COURSES IN THE MAJOR

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	3

Subtotal **30**

ADDITIONAL REQUIRED COURSES

SPE 1330/1335*	Effective Speaking	3
BIO 3524	Nutrition	2
MAT 1272	Statistics	3
BIO 3526	Pathophysiology	3
PSY 2404	Personnel and Organizational Psychology	3

Subtotal **14**

* SPE 1335 Group Discussion or ENG 1121 English Composition II may be substituted for SPE 1330 Effective Speaking. Students who took one of these courses as part of the 60 credits for the AAS will still need to take another one of these 3-credit courses to meet the upper-division Communication Core requirements.

SELECT ELECTIVE COURSES

One approved elective course must be taken in each category of the 5 listed below. Three elective courses must be taken before beginning the fourth semester curriculum plan that includes NUR 4110 and NUR 4130. The following are recommended, but not required, choices for elective courses.

Science Electives

CHEM 1110*	General Chemistry I	4
CHEM 1210	General Chemistry II	4
PHYS 1433	Physics 1.2	4
	or	
PHYS 1441	Physics 1.3	5
BIO 3350	Elements of Bioinformatics	4

* Students without sufficient chemistry background must take CHEM 1110, a prerequisite for Pathophysiology (BIO 3526). If CHEM 1110 was taken and was included in the 60 lower-level transfer credits, then a 4-credit science elective must be taken.

Philosophy Electives

PHIL 2103	Ethics	3
PHIL 2106	Philosophy of Technology	3
PHIL 3400	Environmental Philosophy	3

Sociology Electives*

SOC 1102	Urban Sociology	3
SOC 1103	The Family	3
SOC 2201	Sociology of Aging	3

* Courses in Anthropology, History and Economics will be considered for substitution.

Humanities Electives*

ARTH 1102	History of Art: Renaissance to Modern	3
ARTH 1104	Art of the United States	3
MUS 1201	Musical Concepts: A Guide to Listening	3
MUS 1211	Music of Latin America	3

* For the Humanities electives, select a course from the Aesthetics CORE.

Literature Electives

ENG 2000	Perspectives in Literature	3
ENG 3401	Law Through Literature	3
ENG 3404	The Literature of Illness and Care	3

Subtotal 16-17

TOTAL CREDITS FOR THE DEGREE 120-121

FULL-TIME CURRICULUM PLAN**Credits****THIRD YEAR****First Semester or Term**

SCI	Science Elective-Upper division	4-5
SPE 1330	Effective Speaking	3
NUR 3010	Physical Assessment	3
BIO 3524	Nutrition	2
MAT 1272	Statistics	3

Subtotal 15-16

Second Semester or Term

PHIL	Philosophy Elective	3
NUR 3110	Leadership in the Management of Client Care	5
NUR 3130	Nursing Research	3
PSY 2404	Personnel and Organizational Psychology	3
BIO 3526	Pathophysiology	3

Subtotal 17

FOURTH YEAR**First Semester or Term**

SOC	Sociology Elective	3
NUR 4010	Community Health Nursing	5
NUR 4030	Nursing Case Management: Role and Process	3
NUR	Nursing Elective	3

Subtotal 14

Second Semester or Term

ARTH/MUS	Humanities Elective	3
ENG	Literature: 2000 or 3400 series Elective	3
NUR 4110	Comprehensive Client Care for Urban Health Issues	5
NUR 4130	Professional Nursing Practice	3

Subtotal 14

UPPER DIVISION CREDITS**60****TOTAL CREDITS REQUIRED FOR THE DEGREE****120-121**

PART-TIME CURRICULUM PLAN		Credits	FAST TRACK CURRICULUM PLAN		Credits
THIRD YEAR			For students entering the program who have taken the following courses:		
First Semester or Term			MAT 1272	Statistics	3
SCI	Science Elective-Upper Division	4	SCI	Science Elective-Upper Division	4
NUR 3010	Physical Assessment	3	BIO 3526	Pathophysiology	3
MAT 1272	Statistics	3		Subtotal	10
	Subtotal	10	THIRD YEAR		
Second Semester or Term			First Semester or Term		
SPE 1330	Effective Speaking	3	NUR 3110	Leadership in the Management of Client Care	5
NUR 3130	Nursing Research	3	NUR 3010	Physical Assessment	3
PSY 2404	Personnel and Organizational Psychology	3	NUR 3130	Nursing Research	3
	Subtotal	9	BIO 3524	Nutrition	2
FOURTH YEAR			SPE 1330	Effective Speaking	3
First Semester or Term				Subtotal	16
BIO 3524	Nutrition	2	Second Semester or Term		
NUR 3110	Leadership in the Management of Client Care	5	PSY 2404	Personnel and Organizational Psychology	3
BIO 3526	Pathophysiology	3	NUR4010	Community Health Nursing	5
	Subtotal	10	NUR 4030	Nursing Case Management: Role and Process	3
Second Semester or Term			ARTH/MUS	Humanities Elective	3
NUR	Nursing Elective	3	PHIL	Philosophy Elective	3
PHIL	Philosophy Elective	3		Subtotal	17
SOC	Sociology Elective	3	FOURTH YEAR		
	Subtotal	9	First Semester or Term		
FIFTH YEAR			ENG	Literature: 2000 or 3400 Series Elective	3
First Semester or Term			SOC	Sociology Elective	3
NUR 4010	Community Health Nursing	5	NUR 4110	Comprehensive Client Care for Urban Health Issues	5
NUR 4030	Nursing Case Management: Role and Process	3	NUR 4130	Professional Nursing Practice	3
ENG	Literature: 2000 or 3400 Series Elective	3	NUR	Nursing Elective	3
	Subtotal	11		Subtotal	17
Second Semester or Term			UPPER DIVISION CREDITS		
ARTH/MUS	Humanities Elective	3	60		
NUR 4110	Comprehensive Client Care for Urban Health Issues	5	TOTAL CREDITS FOR THE BS DEGREE		
NUR 4130	Professional Nursing Practice	3	120		
	Subtotal	11			
UPPER DIVISION CREDITS					
60					
TOTAL CREDITS FOR THE BS DEGREE					
120					

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 2010*.

Prerequisite: AAS degree with major in Nursing or approval of BS program coordinator

**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***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, 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 2010*.
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 résumé, a portfolio and template for a project proposal for enhancement of professional development.
Prerequisites: NUR 3110, NUR 3130

Radiologic Technology and Medical Imaging

Professor Mary Alice Browne, Chair
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PROGRAMS:

Radiologic Technology and Medical Imaging/AAS
Radiological Science/BS

FACULTY:

Associate Professor: Bonsignore, Browne
Assistant Professors: DeVito, Ingrassia, Lespinasse, Lobel, Tsenova,
Vinokur

CLT: Gay

RADIOLOGIC TECHNOLOGY AND MEDICAL IMAGING

Welcome to the Department of Radiologic Technology & Medical Imaging website. We offer an AAS degree in Radiologic Technology (65 credits) and a Bachelor of Science degree in Radiological Science (BS in RS) (55 credits - total 120 credits). We aspire to help students fulfill both their educational and professional needs. The AAS degree program requires a full time commitment for two years. Upon completion of this degree, graduates will sit for their board exam for certification and licensure. These credentials will help them take their first step in the job market.

Program structure is 2+2 and is especially designed to accommodate working professionals who desire to pursue an advanced degree in their related fields. The BS in RS degree incorporates a curriculum that recognizes the rapidly changing technology in medical imaging and the growing need for multiskilled medical imagers. Highlights include opportunities for professional and personal development that encourages learning and produces excellence through advanced study in a collegiate and yet comfortable environment. The BS in RS degree is now open for enrollment.

Associate in Applied Science in RADIOLOGIC TECHNOLOGY AND MEDICAL IMAGING

Accreditation

The Radiologic Technology and Medical Imaging program in diagnostic radiography is accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT) and certified by the American Registry of Radiologic Technologists (ARRT).

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 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.

Program Goals

- Students/Graduates will be skilled in the academic and clinical components of radiologic technology.
- Students will communicate effectively with patients while providing appropriate care and radiation protection.
- Students/Graduates will formulate technique factors and demonstrate skills in critical thinking and problem-solving as required of a radiologic technologist.
- Students/Graduates will enter the field of radiologic technology and practice with high ethics and professionalism as illustrated by both graduates and employer satisfaction.

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. Among the employers of the graduates of this program are Brookdale University Hospital & Medical Center, Brooklyn Hospital, Hospital for Special Surgery, Lutheran Medical Center, Maimonides Medical Center, New York Presbyterian Hospital: New York Weill Cornell Center, New York Presbyterian Hospital: Columbia Presbyterian Center, St. Lukes-Roosevelt Hospital Center (St. Lukes Division) and St. Lukes-Roosevelt Hospital Center (Roosevelt Division) and Woodhull Medical and Mental Health Center.

Admission Requirements

- A high school diploma or its equivalent (GED)
- CUNY proficiency in reading, writing and mathematics
- Pre-requisites for BIO 2311: BIO 1101 and BIO 1101Lab, a collegelevel 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. Students lacking the high school course requirement will be required to take BIO 1101. This course must be taken before BIO 2311 and completed with a minimum grade of "C."

Progression to Clinical Courses

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.

If the number of students meeting the stated criteria exceeds the available spaces, seats will be allocated on the basis of the student's academic record and GPA. An index of 2.7 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.

The clinical phase of the program starts only in the fall of each year. The class for the clinical phase is selected during the previous spring semester; therefore, a student must be registered at NYCCT and all eligibility requirements must be completed by the end of the fall semester. Students will be required to complete the twoyear clinical phase of the program within four years.

Performance Standards

An important standard required for progression in and graduation from the Radiologic Technology and Medical Imaging program is 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. 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. Anatomy and Physiology I and II (BIO 2311 and BIO 2312) must be taken prior to the second semester with a minimum grade of "C".

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 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.

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.

Any absence beyond the department policy could result in a failing grade in the class.

Clinical Testing

Students assigned to clinical education sites may be subjected to background checks and drug testing by the clinical affiliates. Each clinical affiliate will set the criteria for background checks and drug screening.

If the student is found in violation of the clinical affiliate's policy, the student will be removed from the clinical education site. This may result in the student being unable to continue in the program because of space availability at other clinical education sites.

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

A graduate of the program should be able to:

- Demonstrate strong cognitive skills in radiologic technology;
- Apply for the National certification and State Licensure exam;
- Position patients for radiographic examinations;
- Communicate clearly and effectively in a diverse environment;
- Illustrate appropriate patient care while working with patients;
- Illustrate radiation protection while working with patients;
- Evaluate radiographic images and determine proper course of action;
- Effectively plan, prepare for, and carry out procedure requirements according to patient's needs;
- Enter the field of radiologic technology;
- Demonstrate proper ethics and professionalism while working with patients.

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 \$1,000,000 each for professional and personal liability.....	\$15 per year paid at the beginning of the second and fourth semesters
Materials fee.....	\$30 paid at the beginning of the first, second, third and fourth semesters.
Estimated textbook fees of \$1,000 over a two-year period	
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
The American Registry of Radiologic Technologists (ARRT) application fee	\$200
New York State Department of Health (NYSDOH) license application fee	\$120

Students in the program are also required to present documented evidence of a complete physical examination demonstrating good health. The examination form will be provided by the Radiologic Technology and Medical Imaging Department. The program complies with New York State immunization requirements and Hepatitis B vaccine is recommended. Additionally, students must submit documented evidence of a negative tuberculin skin test (ppd) annually.

Any student entering the Radiologic Technology and Medical Imaging program who has a felony record should notify New York State Department of Health (www.health.state.ny.us, or call 518.402.7570, and the American Registry of Radiologic Technologists (www.arrt.org or call 651.687.0048) agencies for clarification of his or her eligibility for licensing/certification.

REQUIRED COURSES IN THE MAJOR

		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

Subtotal**41****ADDITIONAL REQUIRED COURSES**

ENG 1101	English Composition I	3
MAT 1275 ¹	College Algebra and Trigonometry	4
BIO 2311 ²	Human Anatomy and Physiology I	4
BIO 2312	Human Anatomy and Physiology II	4
PHIL 2203	Health Care Ethics	3
PSY 1101	Introduction to Psychology	3
SPE 1330	Effective Speaking	3

Subtotal**24****TOTAL CREDITS REQUIRED FOR THE DEGREE****65**

¹ Students without the requisite math background for MAT 1275 will be required to take MAT 1175 in preparation. This will increase the number of credits required for the degree by four (4).

² 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 four (4). Notes:

• Computer literacy is required for graduation. MST 1101 (3 credit course can be taken) or by passing a self-paced qualifying exam available through the College Learning Center can fulfill this requirement.

• See page 35 of the college catalog for additional information.

REQUIRED COURSES IN THE MAJOR		Credits
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
Subtotal		41
ADDITIONAL REQUIRED COURSES		
ENG 1101	English Composition I	3
MAT 1275 ¹	College Algebra and Trigonometry	4
BIO 2311 ²	Human Anatomy and Physiology I	4
BIO 2312	Human Anatomy and Physiology II	4
PHIL 2203	Health Care Ethics	3
PSY 1101	Introduction to Psychology	3
SPE 1330	Effective Speaking	3
Subtotal		24
TOTAL CREDITS REQUIRED FOR THE DEGREE		65
<p>¹ Students without the requisite math background for MAT 1275 will be required to take MAT 1175 in preparation. This will increase the number of credits required for the degree by four (4).</p> <p>² 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 four (4).</p> <p>Notes:</p> <ul style="list-style-type: none"> • Computer literacy is required for graduation. MST 1101 (3 credit course can be taken) or by passing a self-paced qualifying exam available through the College Learning Center can fulfill this requirement. • See page 35 of the college catalog for additional information. 		

Bachelor of Science in RADIOLOGICAL SCIENCE

The Bachelor of Science (BS) in Radiological Science (RS) 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 credentially prepared 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

- Students/graduates will demonstrate versatility in patient assessment.
- Students/graduates will demonstrate effective oral and writing communication techniques
- Students/graduates will demonstrate knowledge in advanced imaging technology academically and in the health care environment.
- Students/graduates will identify the appropriate imaging modality when clinically indicated.
- Students/graduates will apply critical thinking and problem solving skills in making independent and professional decisions.
- Students/graduates will 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.
- A current American Registry of Radiologic Technologist (ARRT) certification.
- 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.
- Students must show proof of a college-level computer course OR must complete the College Learning Center's Self-Paced Computer Literacy program by the end of the first semester in the BS program.

CUNY Articulation Policy

Currently 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 of 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 two years.
- Part-time students are expected to complete the requirements for the degree in five years.

REQUIRED COURSES IN THE MAJOR		Credits
Associate-level Courses in Discipline		41
Arts and Science Electives		24
Subtotal		65
UPPER LEVEL REQUIRED COURSES IN THE MAJOR		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
Subtotal		19
ADDITIONAL REQUIRED COURSES		
MAT 1272	Statistics	3
ENG 1121	English Comp II	3
PSY 3405	Health Psychology	3
ECON 1101	Macroeconomics	3
PHYS 2603	Physical Principles of Medical Imaging (pending State Ed approval)	3
LIT	ENG 2000, 3400 SERIES, AFR, PRS 2200 SERIES	3
LAP	LIT or AES	3
LIB 1201	Research and Documentation in the Information Age	3
Electives	Allowed Free Electives Credits	12
Subtotal		36
Total Bachelor of Science Credits		55
TOTAL CREDITS REQUIRED FOR THE DEGREE		120

1. Transfer credit to be reviewed with the program coordinator. Where fewer than 41 professional credits are applicable to the degree, students will supplement with additional professional and elective courses approved by the program.

2. With approval of program coordinator.

3. See page 35 for a detailed explanation of core-required courses.

FULL-TIME CURRICULUM PLAN		Credits
THIRD YEAR		
First Semester or Term		
RAD 3527	Advanced Patient Assessment/Pharmacology	3
ENG 1121	English Comp II	3
MATH 1272	Statistics	3
Arts and Sciences	Elective	3
Subtotal		12
Second Semester or Term		
RAD 3627	Advanced Sectional Anatomy	2
RAD 3628	Pathophysiology for Medical Imaging	2
PSY 3405	Health Psychology	3
PHYS 2603	Physical Principles of Medical Imaging (pending State Ed approval)	3
Arts and Sciences	Elective	3
Subtotal		13
FOURTH YEAR		
First Semester or Term		
RAD 4726	Advanced Medical Imaging I	3
LIB 1201	Research and Documentation in the Information Age	3
ECON 1101	Macroeconomics	3
LAP	Elective	3
Arts and Sciences	Elective	3
Subtotal		15
Second Semester or Term		
RAD 4826	Advanced Medical Imaging II	3
RAD 4828	Medical Informatics HIS/RIS/QM	3
Arts and Sciences	Elective	3
LIT	Elective	3
RAD 4830	Capstone Leadership Roles in Medical Imaging	3
Subtotal		15
Upper Division Credits		55
TOTAL CREDITS REQUIRED FOR THE DEGREE		120

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

**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; 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)*

13 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 2327
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)*

13 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 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 Anthony Sena, Chair
 Pearl Building, room P 409
 718.260.5137
 eDmail: asena@citytech.cuny.edu

PROGRAM:

Dental Laboratory Technology/AAS

FACULTY:

Professor: Manos
 Associate Professor: Smith
 Assistant Professors: Alter, 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 National Institute of Business Management identified dental technology as the third-fastest-growing profession in the United States; a Newsday survey placed it second in New York State; and the United States Occupational Handbook listed it as growing much faster than the national average.

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 98%. 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
Tools and Supplies	\$330
Books	\$150

Second Semester

Tools and Supplies	\$200
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Third Semester

Tools and Supplies	\$50
Books	\$50

Fourth Semester

Tools and Supplies ¹	\$75
R.G. Examination ²	\$190

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 will be given a non-binding manual dexterity test in RESD 1110L in order to determine their entry-level hand/eye coordination. The results will assist the student in developing these skills.

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 be 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.

REQUIRED COURSES IN THE MAJOR		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 1214	Introduction to Restorative Ceramics	3
RESD 1216	Removable Partial Dentures I	3
RESD 2307	Science of Dental Metallurgy	1
RESD 2310	Principles of Occlusion	2
RESD 2311	Complete Dentures III	2
RESD 2313	Removable Partial Dentures II	3
RESD 2314	Restorative Dental Ceramics II	3
RESD 2409	Laboratory Operation, Ethics and Jurisprudence	2
RESD 2412	Fixed Prosthodontics Practicum	3
RESD 2415	Orthodontics	2
Subtotal		41
Select one of the following two courses for 3 credits:		3
RESD 2411	Complete Dentures/Maxillofacial Concepts	
RESD 2414	Restorative Dental Ceramics Practicum	
Subtotal		3
ADDITIONAL REQUIRED COURSES¹		
CHEM 1000	Principles of Chemistry	4
ENG 1101	English Composition I	3
MAT 1180	Mathematical Concepts and Applications	4
or		
MAT 1275 ²	College Algebra and Trigonometry	4
LAP	Literature/Aesthetics/Philosophy	3
SS/BS	Social Science/Behavioral Science	3
COMM ¹	Communications	3
Subtotal		20
TOTAL CREDITS REQUIRED FOR THE DEGREE		64

¹ See page 35 for a detailed explanation of core-required courses and categories.

² Students who select MAT 1275 instead of MAT 1180 may be required to take MAT 1175 as a prerequisite. In this case the number of credits required for the degree will increase by four.

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. *Prerequisites: 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 1214
Introduction to Restorative
Dental Ceramics***(spring only)*

1 cl hr, 6 lab hrs, 3 cr (prior to Fall 2012)

1 cl hr, 6 lab hrs, 24 hrs externship, 4 cr (effective Fall 2012)

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: Completion of all second-level courses*

**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: Completion of all second-level courses or approval of chair*

**RESD 2313
Removable Partial
Dentures II***(fall only)*

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: Completion of all second-level courses or approval of chair*

**RESD 2314
Restorative Dental
Ceramics II***(fall only)*

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: Completion of all second-level courses or approval of chair*

**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: Completion of all third-level courses or approval of chair*

**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: Completion of all third-level courses*

**RESD 2412
Fixed Prosthodontics
Practicum**

(spring only)

1 cl hr, 6 lab hrs, 3 cr (prior to Fall 2012)

1 cl hr, 3 lab hrs, 2 cr (effective Fall 2012)

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: Completion of all third-level courses

**RESD 2414
Restorative Dental Ceramics
Practicum**

(spring only)

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: Completion of all third-level courses

**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: Completion of all third-level courses

Vision Care Technology

Professor Robert J. Russo, Chair
 Pearl Building, room P 312
 718.260.5298
 email: rrusso@citytech.cuny.edu

PROGRAM:

Ophthalmic Dispensing/AAS

FACULTY:

Professor: Russo
 Assistant Professor: Pasner, Strickler

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 fee	\$600
National licensure fee (ABO).....	\$125
National licensure fee (NCLE).....	\$125
Optical tool kit.....	\$220
All required textbooks (purchased over four semesters).....	\$500
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 eyecare professional/ophthalmic dispenser (optician)
2. Function well in a variety of eyecare 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 eyecare 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.

REQUIRED COURSES IN THE MAJOR		Credits
VCT 1101	Ophthalmic Materials and Laboratory I	3
VCT 1105	Principles of Optics	3
VCT 1201	Ophthalmic Materials and Laboratory II	3
VCT 1212	Anatomy and Physiology of the Eye	4
VCT 1237	Contact Lenses I	3
VCT 2311	Ophthalmic Materials and Laboratory III	2
VCT 2313	Ophthalmic Dispensing I	5
VCT 2316	Ophthalmic Dispensing Clinic I	1
VCT 2327	Contact Lenses II	5
VCT 2413	Ophthalmic Dispensing II	5
VCT 2415	Introduction to the Principles of Refraction	3
VCT 2416	Ophthalmic Dispensing Clinic II	1
VCT 2427	Contact Lenses III	4
Subtotal		42
ADDITIONAL REQUIRED COURSES ²		
BIO 1101	Biology I	4
ENG 1101	English Composition I	3
MATH I ¹	Mathematics	4
COMM	Communications	3
LAP	Literature/Aesthetics/Philosophy	3
BS/SS	Behavioral Science/Social Science	3
Subtotal		20
TOTAL CREDITS REQUIRED FOR THE DEGREE		62

¹ Students without the requisite math background for MAT 1275 will be required to take MAT 1175. This will raise the number of credits required for the degree by four (4).

² See page 35 for a detailed explanation of core-required courses and categories.

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 and mathematics; Corequisite: MAT 1180, or equivalent * 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; Corequisite: MAT 1180, or equivalent * 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 1212
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: CUNY proficiency in reading and writing

**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 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 rioscope, 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 2313, VCT 2316, VCT 2315, VCT 2327

VCT 2313 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 1212, VCT 1213, VCT 1237;
Corequisites: VCT 2311, VCT 2315, VCT 2316, VCT 2327

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 1212, VCT 1213, VCT 1237; *Corequisites:* VCT 2311, VCT 2313, VCT 2316, VCT 2327

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 1201, VCT 1105, VCT 1212; *Corequisite:* VCT 2313, VCT 2311, VCT 2327

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 1212, VCT 12131, VCT 1237, BIO 1101;
Corequisites: VCT 2313, VCT 2315, VCT 2316

VCT 2413 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 2313, VCT 2315, VCT 2316, VCT 2327;
Corequisites: VCT 2416, VCT 2427

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 2313, VCT 2315, VCT 2316, VCT 2327;
Corequisites: VCT 2413, VCT 2427

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.
Corequisite: VCT 2413, VCT 2416

SCHOOL OF TECHNOLOGY AND DESIGN

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Departments:

Advertising Design and Graphic Arts
Computer Systems Technology
Electrical and Telecommunications Engineering Technology
Environmental Control Technology

Architectural Technology
Construction Management and Civil Engineering Technology
Entertainment Technology
Mechanical Engineering Technology

Computer Engineering Technology

Degree Programs:

Bachelor of Technology (BTech)

Architectural Technology
Computer Systems
Facilities Management
Telecommunication Engineering Technology

Communication Design
Emerging Media Technologies
Graphic Arts Production Management

Computer Engineering Technology
Entertainment Technology
Mechanical Engineering Technology

Associate in Applied Science (AAS)

Architectural Technology
Computer Information Systems
Electromechanical Engineering Technology
Graphic Arts Advertising Production Management
Microcomputer Business Systems

Art and Advertising Design
Construction Management Technology
Environmental Control Technology
Mechanical Engineering Technology
Telecommunication Engineering Technology

Civil Engineering Technology
Electrical Engineering Technology
Industrial Design Technology

Certificate Programs:

Air Conditioning Equipment Technician
Desktop Publishing
Scenery Construction
Sustainable Technology

Building and Housing Superintendent Technology
Heating Equipment Technician
Show Control

Construction Management
Lighting Systems
Sound Systems

Mission

The School of Technology and Design helps to build 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.

Certificate in SUSTAINABLE TECHNOLOGY

This multidisciplinary curriculum of Sustainable Technologies within facilities design and operation provides the specifics of life-cycle cost analyses of new high-tech materials, alternative energy systems, and new construction methodologies in the preliminary design phase. The curriculum is intended to meet the growing demands of companies engaged in the field of environmentally friendly systems.

This certificate will satisfy the new consciousness that requires a facility to minimize its adverse environmental impact throughout its lifetime, from concept to construction, during operation, and through to its ultimate salvage. The course of study will provide a firm understanding of sustainability issues, and serve as a career ladder for those working in architectural and engineering design firms, or as consultants, contractors or manufacturers' representatives in companies who will need to fill these specialist positions.

Sustainability Certificate Learning Outcomes

Holders of this certificate will have the combined expertise in mechanical systems, architecture, construction management and civil engineering technology that will enable them to understand and successfully apply and integrate alternative energy systems into a complex building environment.

ADMISSION REQUIREMENTS

Admission to the Sustainability Certificate program requires admission to the College and meeting CUNY proficiency requirements in reading, writing and mathematics, plus one of the following:

45 credits toward an AAS degree in architectural technology, construction management technology, civil engineering technology or environmental control technology; OR

Designation as an Industry Professional. Industry Professionals are individuals who are New York State Registered Architects, New York State Licensed Professional Engineers, or can provide verifiable evidence of eight years experience in one of the following fields: architectural design, construction management; building maintenance and operations; alternative energy system design and installation. These individuals will be required to sign an acknowledgement that they have been informed of the mathematics and English requirements of the courses they will be taking.

CERTIFICATE STRUCTURE

The program consists of both required fundamentals courses and electives

I. Fundamentals

There are two groups of fundamental courses:

- Group A** - For environmental control technology students and all Industry Professionals: architectural and construction management courses to provide a base of knowledge in these disciplines.
- Group B** - For architectural technology and construction management technology students and all Industry Professionals: environmental control technology courses to provide a base of knowledge along with some laboratory experience in the field of environmental control technology.

Group A (for EC and industry professionals)

ARCH 1130	Building Technology ¹	2
CMCE 1104	Statistics and Strength of Materials I ¹	2
ARCH 1250	Site Planning ¹	2

Group B (for AR, CM/CV and industry professionals)

ENVC 1110	Principles of Air Conditioning I	3
ENVC 1220	Hydronic Systems Design ¹	3
ENVC 2321	Air Conditioning Systems Lab II ¹	1

II - Electives

There are three groups of electives. Students will be required to take one course from each group thereby achieving a broad understanding of sustainability in other disciplines with their major serving as their specialty. Students who have already taken one of the certificate electives as part of their regular coursework can have it counted toward the certificate without being required to take an additional class in that elective/discipline group.

Electives (one course from each of the following groups)

ARCH Group

ARCH 3550	Building Performance Workshop ¹	3
ARCH 3510	Architectural Design V ¹	3
ARCH 3561	Architectural Office Management ¹	3

CMCE Group

CMCE 1220	Construction Management I ¹	2
CMCE 2412	Construction Estimating ¹	2

ENVC Group

ENVC 2421	Air Conditioning Systems Lab III ¹	3
ENVC 2452	Principles of Facilities Energy Management ¹	3

¹ Prerequisites are as listed in the catalog for each course; OR an AAS in architectural technology, construction management technology, civil engineering technology, or environmental control technology; OR, designation as an Industry Professional in accordance with the parameters described within admission requirements. In addition, Industry Professionals will be required to sign an acknowledgement that they are aware of the mathematics and English requirements of the courses they will be taking and will need the approval of the program director.

CREDIT SUMMARY

Architectural Technology, Civil Engineering Technology and Construction Management Technology degree holders and Industry Professionals:

Group B Courses	7
Elective Courses	min. 8
Total	min. 15

Environmental Control Technology degree holders:

Group A Courses	6
Elective Courses	min. 8
Total	min. 14

Industry Professionals:

Group A Courses	6
Group B Courses	7
Elective Courses	min. 8
Total	min. 21

Advertising Design and Graphic Arts

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Graphic Arts Program
Pearl Building, room P 100 (Atrium)
718.260.5823

PROGRAMS:

Art and Advertising Design/AAS
Communication Design/BTech
Graphic Arts Advertising Production Management/AAS
Graphic Arts Production Management/BTech
Desktop Publishing/Cert

FACULTY

Professors: Aptekar, Holden, Mason
Associate Professors: Biehl, Carr, Giuliani, McVicker, Michals,
Rothwell, Spevack
Assistant Professors: Adae, Cai, Clark, Davis, Durham, Giraldo,
Goetz, Hitchings, Larson, Neugeboren, Petrillo, Wong
Lecturers: Brodeur, Manigault
Chief CLTs: Caputo, Sherman
Senior CLTs: Miñon, Vazquez
CLT: Saada

Associate in Applied Science in ART AND ADVERTISING DESIGN

The advertising design industry is one of the most creative and dynamic in the United States. Advertising agencies, graphic design firms, corporate communications departments, publishing companies, television studios and other design-related operations offer many challenging and rewarding careers as advertising art directors, graphic designers, computer graphics and website designers, illustrators, comic book artists and packaging designers.

New York City, the leading center of advertising 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.

Founded in 1946, the department has an outstanding 60+ year record of preparing men and women for creative careers in advertising, graphic design and communications media. It offers two degree programs in advertising design: a two-year lower-division program leading to the Associate in Applied Science (AAS) in art and advertising design and a four-year program leading to the Bachelor of Technology (BTech) degree in communication design. The department also offers a certificate program in desktop advertising design industry or elsewhere, the department offers courses during day and evening hours on either a full- or part-time basis.

The AAS degree program in art and advertising design provides students with a solid foundation in theory and current practices of the advertising design industry and a core of liberal arts and science courses. Students are offered a broad range of foundation courses – from figure drawing, design and color, typography, photography and design studio procedures to advanced courses including digital media, video, animation, graphic design, advertising, illustration, web design, packaging design and an advertising design internship. The program prepares students for successful entry into the advertising design profession with broad knowledge of the industry, a solid foundation in liberal arts and sciences and a well-rounded portfolio.

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. Some graduates have opened their own agencies, while others 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 advertising design and graphic arts course 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 Advertising Design and Graphic Arts Department.

Program Outcomes

Graduates of the Art and Advertising Design AAS degree program are prepared to obtain entry-level employment as assistant graphic designers or assistant advertising art directors. They will have proficiency in a range of software applications such as Quark, InDesign, Photoshop and Illustrator for desktop publishing, digital imaging, vector art and web design. They will be able to solve creative problems involving photography, typography, advertising, graphic design and illustration, while applying design and studio skills to assist advertising design art directors, graphic designers and web designers. They will also be qualified to enter a baccalaureate degree program in advertising design, graphic design, web design, broadcast design/motion graphics, or animation/illustration/game design graphics.

Approximate Additional Costs other than Tuition and College-wide Fees

Textbooks.....	\$400
Professional Tools.....	\$500
Materials Fees.....	\$40
Supplies.....	\$600
Portfolio Preparation.....	\$150

REQUIRED COURSES IN THE MAJOR		Credits
ADV 1100	Graphic Design Principles I	3
ADV 1103	Foundation Drawing	2
ADV 1161	Publications Media	3
ADV 1162	Raster and Vector Graphics	3
ADV 1200	Graphic Design Principles I	3
ADV 1227	Typographic Design I	2
ADV 1231	Figure Drawing	2
ADV 2300	Communication Design I	3
ADV 2327	Typographic Design II	2
ADV 2400	Communication Design II	3
ADV 2427	Typographic Design III	2
ADV 2450	Web Design I	2
GRA 1111	Graphic Communications Workshop	2
GRA 2330	Digital Photography I	2
Subtotal		34
Elective Courses in the Major (choose any two courses)		
ADV 2313	Illustration I	3
ADV 2340	Digital Photography II	3
ADV 2320	Intro to Film and Video Design Production	3
ADV 2412	Packaging Design	3
ADV 2413	Illustration II	3
GRA 2316	Digital Imaging Production	3
GRA 3532	Print Production for Designers	3
Subtotal		6
ADDITIONAL REQUIRED COURSES		
ENG 1101	English Composition I	3
COMM	ENG 1121/English Composition II	3
LAP	ARTH 3311/The History of Graphic Design	3
BS	PSY 1101/Introduction to Psychology	3
MATH I	MAT 1180	4
SCI I ¹	Laboratory Science	4
Subtotal		20
TOTAL CREDITS REQUIRED FOR THE DEGREE		60

¹ See page 35 for a detailed explanation of core-required courses and categories.

Bachelor of Technology in COMMUNICATION DESIGN

Today, advertising and communication design is dominated by digital technology: from large creative departments to small companies that outsource work to specialists; from traditional print and broadcast design to multimedia and interactive design. Although entry-level jobs are a first step for either AAS or BTech graduates, employees with a baccalaureate degree are considered more prepared for promotion in the industry. The upper-division courses in communication design are based on those in the AAS degree program. AAS foundation courses integrate design theory and practice. Baccalaureate-level coursework builds on that foundation and offers additional tools for professional advancement. In the bachelor's program, a choice of career tracks allows students to specialize in either advertising design, graphic design, web design broadcast design/motion graphics or animation/illustration/game design graphics and explore the multi-faceted world of communication design. Advanced electives available to students in all five tracks will encourage them to investigate topics in advertising, graphic design, packaging design and typography. Students may further develop their design and communication skills by taking electives including desktop publication design, broadcast design, video, 2-D and 3-D animation, illustration, photography, speech, business management and advertising production management. A core of advanced design courses will prepare students to meet the challenges of the profession: senior project, portfolio, the design team and an internship. The department also continually modifies its curriculum to reflect current practices in the profession by offering new and experimental courses in the latest technical advances including web design and animation. For more information about these courses, contact the department chairperson.

BTech graduates should expect rapid progress from entry-level positions to managerial positions in such job classifications as assistant art director to art director, assistant creative director to creative director, junior designer to senior designer and design studio assistant to design manager, to name a few progressions.

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, see page 8, 34. Students who do not meet these guidelines may be admitted into the AAS degree program in art and advertising 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 Borough of Manhattan, Bronx and Kingsborough

Community Colleges. Students from these colleges who complete all their 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 advertising 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 Advertising Design and Graphic Arts Department.

Program Outcomes

Graduates of the Communication Design Bachelor of Technology (BTech) degree program are prepared to obtain more advanced employment as associate graphic designers, associate art directors, associate web designers, associate broadcast designers, associate animators and game design graphics designers. They will have proficiency in a range of advanced software applications such as AfterEffects, Final Cut Pro, Flash, XHTML, CSS and Maya. They will be able to demonstrate advanced design skills in advertising design, graphic design, web design, broadcast design/motion graphics or animation/ illustration/game design graphics with a portfolio of professional quality samples, while applying advanced design and studio skills to assist advertising design art directors, graphic designers, web designers, broadcast designers, animators and game designers. They will also be qualified to earn an appropriate master's degree in advertising design, graphic design, web design, broadcast design/motion graphics, animation/ illustration/game design graphics, or art/design education.

Approximate Additional Costs other than Tuition and College-wide Fees for the Baccalaureate Degree Program

Textbooks.....	\$750
Materials and supplies.....	\$1500

REQUIRED COURSES IN THE MAJOR

Credits

Select one module from the following for 18 credits:

Advertising Design

ADV 3500	Campaign Development I	3
ADV 3523	Storyboard Concepts	3
ADV 3662	Interactive Animation	3
ADV 3600	Campaign Development II	3
ADV 3610	Interactive Art Director for Advertising	3
GRA 3532	Print Production for Designers	3

Graphic Design

ADV 3501	Corporate Identity Design	3
ADV 3503	Topics in Graphic Design	3
ADV 3527	Advanced Typography	3
ADV 3601	Information Design	3
ADV 3611	Desktop Publication Design I	3
GRA 3532	Print Production for Designers	3

Web Design

ADV 3551	Web Design II (CSS & XHTML)	3
ADV 3560	Web Site Architecture	3
ADV 3561	Web Analytics, SEO & SEM	3
ADV 3652	Web Design III/Design Studio	3
ADV 3662	Interaction Animation	3
ADV 3663	Dynamic Web I: Web 2.0	3

Broadcast Design/Motion Graphics

ADV 3620	Broadcast Design I	3
ADV 3521	Motion Graphics I	3
ADV 3523	Storyboard Concepts	3
ADV 3621	Motion Graphics II	3
ADV 3630	Broadcast Design II	3
ENT 3390	Sound for Multimedia	3

Animation/Illustration/Game Design Graphics

(Choose Option A or Option B)

Option A

ADV 3523	Storyboard Concepts	3
ADV 3540	2-D Animation I	3
ADV 3642	Topics in Animation & Motion Graphics	3
ADV 3508	Introduction to Game Design Concepts	3
ADV 3640	3-D Animation and Modeling I	3
ADV 3641	2-D Animation II	3

Option B

ADV 3513	Advanced Illustration I	3
ADV 3523	Storyboard Concepts	3
ADV 3642	Animation and Motion Graphics Seminar	3
ADV 3508	Introduction to Game Design Concepts	3
ADV 3613	Advanced Illustration II	3
ADV 3640	3-D Animation and Modeling I	3

AD UPPER ELECTIVE COURSES

Select two courses from the following for 6 credits

ADV 3502	Topics in Advertising	3
ADV 3530	Advanced Photo Studio	3
ADV 3627	Time-Based Topography	3
ADV 3712	Topics in Packaging Design	3
ADV 4711	Desktop Publishing Design II	3
ADV 4713	Advanced Illustration III	3
ADV 4740	3-D Animation and Modeling II	3
ADV 4741	2-D Animation II	3
ADV 4762	Interactive Interface Design	3
ADV 4763	Dynamic Web II	3
ADV 4764	Design for Mobile Devices	3
ADV 4843	Career Strategies for Animators	3
ADV 4860	Streaming Media	3
GRA 2412	Desktop Presentations	3
GRA 3508	Desktop Publishing Production II	3
GRA 3607	Digital Asset Management	3
GRA 3611	Vector Art Editing	3
ENG 3773	Advanced Technical Writing	3
ENT 3390	Sound for Media ++	3
LIB 1201	Research and Documentation in the Information Age	3
MKT 2450	Marketing Management +	3
ARTH	Art History	3
CST	Web Module Courses +++	3

+ Requires Business Department approval

++ Requires Entertainment Technology Department approval

+++ Requires Computer Systems Technology Department approval

Students may also choose courses required in any other modules as electives

REQUIRED COURSES IN THE MAJOR**Credits****AAS Degree in Advertising Design****60**

ADV 4700	The Design Team	2
ADV 4800	The Portfolio	2
ADV 4830	Senior Project	3
ADV 4900	Internship in Advertising/Graphic/Web/ Broadcast Design/Animation/Illustration/ Game Design Graphics	3
Subtotal		10

REMAINING BACCALAUREATE CORE DISTRIBUTION

COMM	SPE 1300 series (Speech)	3
COMM	ENG 3771/Advanced Career Writing	3
LIT ¹	ENG 2000 series or higher	3
MATH II	MAT 1280	4
Advanced BS	PSY 3407/Psychology of Visual Perception	3
LAP ¹	ARTH 1100/Art History	3

SCI II ¹	Laboratory Science	4
SS ¹	Social Science	3
Subtotal		26
TOTAL CREDITS REQUIRED FOR THE DEGREE		120

¹ See page 35 for a detailed explanation of core-required courses and categories.

Associate in Applied Science in GRAPHIC ARTS ADVERTISING PRODUCTION MANAGEMENT

This program is designed for students seeking a career in the New York area's multi-billion dollar graphic arts industry which includes advertising, printing, publishing, corporate communications, packaging, labeling and new media. Students learn theory followed by laboratory work using current industry specifications and standards. A knowledge base and skill sets are developed through courses in office systems, estimating, imaging, page assembly, prepress, presswork, binding and finishing, quality control and customer service. Students also learn about current industry developments through lectures, field trips, guest speakers and participation in industry events.

Students may obtain the AAS degree and then continue their studies in the BTech in graphic arts production management program. It is not necessary to complete the AAS degree to transfer to the baccalaureate program. This may be done after completing 24 credits and achieving CUNY proficiency in reading, writing and mathematics. The AAS degree will be earned upon completion of the required 60 credits.

Graduates of the AAS program qualify for such positions as assistant production managers, customer service representatives, sales people, estimators, desktop publishing operators, imaging and scanning operators, quality control specialists, prepress technicians and magazine/book makeup coordinators.

Employers of graduates include Newsweek magazine, RR Donnelley, Rolling Press, AOL-Time-Warner, Condé Nast Publications, Young & Rubicam Advertising Agency, The New York Times, Arlington Press, Quad Graphics and Quebecor World.

Program Outcomes

Graduates of the Graphic Arts Advertising Production Management AAS degree program are prepared to obtain entry-level employment in the graphic communications industry as assistant production managers, customer service representatives, assistant desktop publishing operators, graphic arts sales persons, imaging and scanning operators and assistant prepress technicians. They will have proficiency in desktop publishing, digital imaging and vector art using graphic arts prepress production software applications such as Quark, InDesign, Photoshop and Illustrator. As production staff members they will use their knowledge base and

skill-sets to help develop production solutions to problems in estimating, quality assurance and fundamentals of production management. They will also be qualified to enter a baccalaureate degree program in the graphic communications field.

REQUIRED COURSES IN THE MAJOR		Credits
GRA 1111	Graphic Communications Workshop	2
GRA 1150	Graphic Arts Management Office Systems	3
GRA 1209	Impositions, Plates and Proofs	3
GRA 1213	Black and White Press Work	2
GRA 2300	Color Reproduction Theory	2
GRA 2301	Ink and Color Analysis	2
GRA 2303	Desktop Publishing Production I	3
GRA 2317	Graphic Arts Estimating I	3
GRA 2320	Digital Photography	2
GRA 2406	Production Management Systems I	3
GRA 2419	Quality Control Management Systems	3
ADV 1161	Publications Media	3
ADV 1162	Raster and Vector Graphics	3
Select two of the following courses for 6 credits:		
GRA 2313	Color Presswork	3
GRA 2316	Digital Imaging Production	3
GRA 2412	Desktop Presentations	3
GRA 2417	Graphic Arts Estimating II	3
GRA 2900	Graphic Arts Internship	3
MKT 1102	Principles of Selling	3
MKT 1214	Advertising	3
Subtotal		40
ADDITIONAL REQUIRED COURSES ¹		Credits
ENG 1101	English Composition I	3
COMM	ENG 1101 /English Composition I	3
COMM	ENG 1121/English Composition II	3
MATH I	MAT 1180	4
SCI I	Laboratory Science I	4
LAP	Literature/Aesthetics/Philosophy	3
BS/SS	Behavioral Science or Social Science	3
Subtotal		20
TOTAL CREDITS REQUIRED FOR THE DEGREE		60
<p>The College will grant an Associate in Applied Science (AAS) degree with a major in Graphic Arts Advertising Production Management upon satisfactory completion of the required 60 credits listed.</p> <p>¹ See page 35 for a detailed explanation of core-required courses and categories.</p>		

Bachelor of Technology in GRAPHIC ARTS PRODUCTION MANAGEMENT

The Bachelor of Technology (BTech) degree is for students who are motivated towards a career in the managerial and supervisory activities within the graphic arts fields: advertising, printing, publishing, graphic communications and new media.

The curriculum in the baccalaureate program provides students with managerial expertise and builds upon the skills learned in the AAS program. It offers production management with practical applications and enables the student to have the flexibility of making career changes among the major areas of the graphic arts. Emphasis is placed on the use of state-of-the-art equipment and technology with major use of computers and related systems. Students acquire proficiency in executive, sales, managerial, technical and supervisory activities. They also gain the knowledge and skills necessary to function as graphic arts production managers, responsible for monitoring, controlling and processing all print media and capable of interpreting graphic and visual information. As part of their program of study, students attend lectures, work in laboratories and go on field trips to leading advertising agencies, service bureaus, publishing houses, corporations and printing plants.

There are many ways a student can enter the Bachelor of Technology program in graphic arts production management. Students may enter as freshmen if they meet the general College criteria on page 8, 34. These students will follow the graphic arts AAS curriculum for the first 60 credits and may earn the AAS along the way. Students may transfer in from the City Tech AAS program in graphic arts or art and advertising design 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. It is not necessary to have earned an associate degree in graphic arts, 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 BTech degree. Please consult the admissions office or the department for further information.

Job titles for which graduates qualify may include production or traffic manager, quality control manager, prepress supervisor, color imaging manager, sales manager, purchasing agent, print buyer, book makeup coordinator, plant manager and manufacturing supervisor. Among the employers of BTech graduates are Newsweek magazine, RR Donnelley, Rolling Press, AOL-Time-Warner, Condé Nast Publications, Young & Rubicam Advertising Agency, The New York Times, Arlington Press, Quad Graphics and Quebecor World.

Program Outcomes

Graduates of the Graphic Arts Production Management Bachelor of Technology (BTech) degree program are prepared to obtain employment as production or traffic managers, quality control managers, purchasing agents, prepress supervisors, color imaging managers, sales managers, print buyers and manufacturing supervisors. They will have advanced proficiency in applications for desktop publishing, management information systems and vector art

and apply advanced production skills using applications such as Quark, InDesign, Photoshop, Illustrator, Estimator, MS Project, Markware Preflight, CIE-LAB mapping software, calibration software, raster image processing software and digital asset management software. They will also be able to demonstrate advanced production management skills in workflow, binding/finishing, preflight, digital assets, print-on-demand and digital presswork. Graduates will also be qualified to enter an appropriate master's degree in publication management, communication management, business management or graphic communication education.

REQUIRED COURSES IN THE MAJOR		Credits
Required Major Courses for Graphic Arts AAS Degree		40
Remaining Core Distribution for the AAS Degree		20
Subtotal of AAS Courses		60
REQUIRED COURSES IN THE MAJOR		Credits
GRA 3508	Desktop Publishing Production II	3
GRA 3515	Production Management Systems II	2
GRA 3516	Binding and Finishing Operations	2
GRA 3600	Topics in Graphic Arts Management	2
GRA 3607	Digital Data Asset Management	3
GRA 3612	Print-On-Demand Management	3
GRA 4712	Portable Document Formats	2
GRA 4715	Project Management and Workflow Analysis	2
GRA 4732	Advanced Digital PreFLyt	3
GRA 4800	The Graphic Arts Production Team	3
GRA 4900	Graphic Arts Internship	3
Select three of the following courses for 9 credits:		
GRA 3513	Digital Color Presswork	3
GRA 3611	Vector Art Editing	3
GRA 4817	Estimating and Cost Control Systems	3
GRA 4830	Senior Project	3
ADV 3620	Broadcast Design	3
Subtotal		37
ADDITIONAL REQUIRED COURSES¹		
COMM	ENG 3771/Advanced Career Writing	3
COMM ¹	SPE 1300 series (Speech)	3
SOC	ECON 1101/Macroeconomics	3
HIS ¹	History	3
MAT	MAT 1280/Quantitative Mathematics	4
LAP ¹	Literature	3
SCI II ¹	Laboratory Science II	4
Subtotal		23
TOTAL CREDITS REQUIRED FOR THE DEGREE		120

¹ See page 35 for a detailed explanation of core-required courses and categories.

Certificate in DESKTOP PUBLISHING

This 30-credit certificate program enables individuals currently working in the graphic arts industry to update their knowledge and gain new skills. Desktop publishing is used to produce newsletters, brochures, direct mail and a wide range of other materials including new media.

Desktop publishing has had a major impact on the graphic communications industry. There is a strong demand for a trained workforce with specialized technical knowledge and skills. This program provides the training in a variety of areas including office systems, imaging, vector art graphics, page assembly, quality control management and applied color theory. Two essential courses focus on impositions, plates and proofs and black and white presswork.

Successful completion of the certificate program requires 30 credits, 24 in the major and 6 in liberal arts. Credits earned in the program are also transferable to the Associate in Applied Science (AAS) degree in graphic arts advertising production management and to the Bachelor of Technology (BTech) degree in graphic arts production management.

Graduates may be promoted from their current positions to jobs working as desktop publishing operators, customer service representatives, printing specialists, vector art editors and magazine production coordinators.

Program Outcomes

Graduates of the Certificate program are prepared to increase employment opportunities in the graphic communications industry as entry-level assistant production artists. They will have basic proficiency in desktop publishing, digital imaging and vector art using graphic arts prepress production software applications such as Quark, InDesign, Photoshop and Illustrator. They will also assist in developing production solutions to basic problems in estimating, quality assurance and fundamentals of production management. Upon completing the program they will be qualified to enter an associate or bachelor's degree program in the graphic communications field.

REQUIRED COURSES IN THE MAJOR Credits

GRA 1111	Graphic Communications Workshop	2
GRA 1209	Impositions, Plates and Proofs	3
GRA 1213	Black and White Presswork	2
GRA 2300	Color Theory and Practice	2
GRA 2419	Quality Control Management Systems	3
ADV 1161	Publications Media	3
ADV 1162	Raster and Vector Graphics	3
Subtotal		18

Select two of the following six courses for 6 credits:

GRA 1150	Graphic Arts Management Office Systems	3
GRA 2303	Desktop Publishing Production I	3
GRA 2313	Color Presswork	3

GRA 2317	Graphic Arts Estimating I	3
GRA 3513	Digital Color Presswork	3
Subtotal		6
ADDITIONAL REQUIRED COURSES		
COMM	ENG 1101/English Composition I	3
COMM	SPE 1300 series (Speech)	3
Subtotal		6
TOTAL CREDITS REQUIRED FOR CERTIFICATE		30

COURSES:**ADV 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 Corequisites: ENG 092R (ESOL 032R), ENG 092W (ESOL 031W), as required

**ADV 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 Corequisite: ENG 092R (ESOL 032R) and/or ENG 092W (ESOL 031W), as required.

**ADV 1161
Publications Media***2 cl hrs, 2 lab hrs, 3 cr*

Students learn basic typography and page assembly techniques

including elements, measurements, fonts, settings and configurations, proofreading mark-ups and corrections, altered file naming conventions and storage organizations. The course also emphasizes the proper use of keyboard controls and the relationship of type to page assembly. Students learn to use industry standard software such as InDesign on the Macintosh operating system. In addition there will be an emphasis on student mastery of industry terminology.
Prerequisite: CUNY proficiency in reading, writing and mathematics OR Corequisite: ENG 092R (ESOL 032R) and/or ENG 092W (ESOL 031W), as required.

**ADV 1162
Raster & Vector Graphics***2 cl hrs, 2 lab hrs, 3 cr*

Students will learn concepts and applied theories of digital media and the two fundamental graphic forms: raster and vector digital images and will define and describe similar and contrasting factors in each kind of image. The comparison will also recommend the best practice, specification or standard for using a specific form in a specific application. Basic digital imaging terminology, and techniques including size, resolution, color space and file elements, measurements and file formats. Students are introduced to digital imaging concepts through software such as Adobe Photoshop and Illustrator on the Macintosh operating system. Scanning and digital photography are integrated into lesson plans.
Prerequisite: CUNY proficiency in reading, writing and mathematics OR Corequisite: ENG 092R (ESOL 032R) and/or ENG 092W (ESOL 031W), as required.

**ADV 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: ADV 1100

**ADV 1212
Three-Dimensional Design
ADV Elective***1 cl hr, 2 lab hrs, 2 cr*

Principles of three-dimensional 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.
Prerequisites: ADV 1100, ADV 1103

**ADV 1213
Structural Analysis
ADV 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: ADV 1100, ADV 1103

**ADV 1215
Printmaking
ADV 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: ADV 1100, ADV 1103

**ADV 1220
Painting and Composition
ADV Elective***1 cl hr, 2 lab hrs, 2 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: ADV 1100, ADV 1231

**ADV 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: ADV 1161, ADV 1162

**ADV 1231
Figure Drawing***1 cl 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: ADV 1103

**ADV 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: ADV 1162, ADV 1200, ADV 2327, GRA 2330

**ADV 2313
Illustration I***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: ADV 1231, CUNY proficiency in reading, writing and mathematics

**ADV 2320/ENT 1190
Introduction to Film and
Video Production Design**

4 cl 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: GRA 1111 or ADV 1200 (for Advertising Design and Graphic Arts Students)

**ADV 2327
Typographic Design II**

1 cl hr, 2 lab hrs, 2 cr

Creative solutions to typographical problems. Principles of typeface selection and use of typographical grids. Variety of basic layouts and formats are introduced. The computer is used to achieve these concepts using software applications such as QuarkXpress and InDesign. This course emphasizes the appropriate use of type with current technology.

Prerequisite: ADV 1227

**ADV 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: GRA 2330

**ADV 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: ADV 1162, ADV 2300; Corequisite: ADV 2427

**ADV 2412
Packaging Design
ADV 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.

Prerequisites: ADV 1161, ADV 1162, ADV 2300, ADV 2427

**ADV 2413
Illustration II
ADV 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: ADV 2313

**ADV 2427
Typographic Design III**

1 cl hr, 2 lab hrs, 2 cr

This course addresses higher level creative and comprehensive study of typographic design principles. Type considerations and variations when creating multiple columns and multiple page applications. Exercises include intensive use of body copy for magazines, newspapers, tables, and books. Font management and file preparation are also discussed.

Prerequisites: ADV 2327

**ADV 2450
Web Design I**

1 cl hr, 2 lab hrs, 2 cr

A required course for all Advertising Design and Graphic Arts students. Topics include creative user interface design and best workflow practice. Students will design a website using an XHTML template, and will develop design, typography and web programming skills. XHTML and CSS will be taught.

Prerequisite: ADV 2300 or department approval

**ADV 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: ADV 2400-level courses or equivalent or department approval

**ADV 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: ADV 2400-level courses or equivalent or department approval

**ADV 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: ADV 2400-level courses or equivalent

**ADV 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: ADV 2400-level courses or equivalent

**ADV 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: ADV 3640 or department permission Pre- or corequisite: ADV 3523*

**ADV 3513
Advanced Illustration I***3 cl 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: ADV 2400 level course or equivalent

**ADV 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: ADV 3527 or department approval; Pre- or corequisite: ENT 3317

**ADV 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: ADV 2400 level courses or equivalent or department approval

**ADV 3527
Advanced Problems in
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: ADV 2427; Corequisite: ADV 1162

**ADV 3530
Advanced Photography
Studio***3 cl hrs, 3 cr*

Exploration of advanced studio and darkroom techniques. Topics include color theory, films, color print materials and processing, tone control techniques, lighting. Creative assignments using the large camera format.

Prerequisite: ADV 2400-level courses or equivalent

**ADV 3540
Two-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: ADV 2400 or department approval

**ADV 3551
Web Design II—
Advanced XHTML and CSS***2 cl hrs, 2 lab hrs, 3 cr*

After taking the introductory ADV 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: ADV 2450

**ADV 3560
Web Site Architecture***2 cl hrs, 2 lab hrs, 3 cr*

Building on skills learned in ADV 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.

Corequisite: ADV 3551

**ADV 3561
Web Analytics: SEO, SEM***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: ADV 2450; Corequisite: ADV 3560 or a computer-related degree or department approval

**ADV 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: ADV 3500

**ADV 3601
Information Design I***3 cl hrs, 3 cr*

Continuation of the development of skills learned in ADV 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: ADV 3501

**ADV 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: ADV 2400, ADV 4750

**ADV 3611
Desktop Publication Design I***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: ADV 3500 or ADV 3501

**ADV 3613
Advanced Illustration II***3 cl hrs, 3 cr*

A continuation of ADV 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: ADV 3513

**ADV 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: ADV 3500 or ADV 3501 or ADV 3530 or department approval

ADV 3621 Motion Graphics II

2 cl hrs, 2 lab hrs, 3 cr
A continuation of ADV 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: ADV 3521 or department approval

ADV 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: ADV 3620 and ADV 3630 or department approval; Pre- or corequisite: ENT 3390

ADV 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: ADV 3620 or department approval

ADV 3640 3-Dimensional Animation and Modeling

2 cl hrs, 2 lab hrs, 3 cr
An introduction to computer 3-D modeling, rendering and animation using software such as Cinema 4D XL. Students learn the tools and techniques for building models and scenes, rendering them with various surfaces for use in screen presentations (CD ROM, websites, video and film), and creating graphics for print media. While exploring 3-D design aesthetics, the course emphasizes the practical and technical features of the software. Students gain familiarity with advanced modeling techniques and the hierarchical structure of complex models.
Prerequisite: ADV 3540 or department approval

ADV 3641 2D Animation II

2 cl hrs, 2 lab hrs, 3 cr
This course continues to develop animation skills learned in ADV 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: ADV 3540

ADV 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: ADV 3500 level courses

ADV 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: ADV 3551 or department approval

ADV 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: ADV 1161, ADV 2427, ADV 2450

ADV 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: ADV 3560

ADV 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: ADV 2412

ADV 4700 The Design Team

1 cl hr, 2 lab hrs, 2 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 GRA 4800, The Graphic Arts Production Team.
Prerequisite: ADV 3551 or ADV 3600 or ADV 3601 or ADV 3613 or ADV 3630 or ADV 3641

ADV 4711 Desktop Publication Design II

2 cl hrs, 2 lab hrs, 3 cr
A continuation of ADV 3611. 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: ADV 3600 or ADV 3601, ADV 3611

ADV 4713 Advanced Illustration III

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: ADV 3613

ADV 4720 Multimedia Design I

2 cl hrs, 2 lab hrs, 3 cr
This course is an introduction to the principles and practice of multimedia design. It explores ways of communicating concepts or information interactively. Students are expected to become skilled in

manipulating data from a variety of sources including audio, video, still images, animation, physical objects and text using appropriate interactive techniques. Creative assignments leading to the design and production of an interactive presentation either for CD-ROM, Web or kiosk using software such as Macromedia Director.

Prerequisite: ADV 3600 or ADV 3601

ADV 4740 3-D Animation and Modeling II

2 cl hrs, 2 lab hrs, 3 cr

This is an advanced course in computer 3-D modeling, rendering and animation using software such as Cinema 4D XL. Students will learn advanced techniques for building models and scenes, animating characters, real-time content creation, programming with C.O.F.F.E.E., and rendering with complex surfaces for use in screen presentations (CD-ROM, websites, video and film), and creating graphics for print media. While exploring 3-D design aesthetics, the course will emphasize the practical and technical features of the software. Student will gain familiarity with advanced modeling techniques, complex surfaces, character animation, modeling for games and programming. *Prerequisite: ADV 3640 or department approval*

ADV 4741 2D 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: ADV 3641*

ADV 4762 Interactive Interface Design

2 cl hrs, 2 lab hrs, 3 cr

Continuation of the development of skills learned in ADV 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 Actionscript. Students will learn to execute rich media content for the web. *Prerequisite: ADV 3662*

ADV 4763 Dynamic Web II

2 cl hrs, 2 lab hrs, 3 cr

Building on dynamic web interface tools learned in ADV 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: ADV 3663

ADV 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: ADV 3652

ADV 4800 The Portfolio

2 cl hrs, 2 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: ADV 4700; Corequisite: ADV 4830

ADV 4820 Multimedia Design II

2 cl hrs, 2 lab hrs, 3 cr

This course is designed to provide an advanced knowledge of multimedia production using software such as Macromedia Director. The lectures are based on exploration of scripting, interactivity, template usage for Game Design and creation of advanced environments for enhanced CD-ROM and Web delivery. The goal is to study programming for the design process, and the production and presentation of advanced interactive environments.

Prerequisite: ADV 4720

ADV 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: ADV 4700; Corequisite: ADV 4800

ADV 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: ADV 3642

ADV 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: ADV 3652 or department approval*

ADV 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: ADV 2300, ADV 2427*

ADV 4900 Internship in Advertising/ Graphic 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: ADV 4700

GRA 1111 Graphic Communications Workshop

1 cl hr, 2 lab hrs, 2 cr

This course introduces students to core concepts in the graphic communications field. Lectures will provide historical perspective as well as examining current practice and future media trends. Students will examine and work with digital technologies for print and the web such as Portable Document Formats (PDF) and Extensible Hypertext Markup Language (XHTML). Examination of the role of typography, paper, color theory and image capture in the design and production process. Students will also develop and maintain an e-Portfolio following an orientation in the College e-Portfolio lab. Two field trips will be an integral part of the course

Prerequisite: CUNY proficiency in reading, writing and mathematics OR Corequisite: ENG 092R (ESOL 032R) and/or ENG 092W (ESOL 031W), as required

GRA 1150 Graphic Arts Management Office Systems

2 cl hrs, 2 lab hrs, 3 cr

Orientation and operating procedures as practiced in the graphic arts industry by managers on a computer operating system. Proper operating system terminology and definitions for working knowledge of desktop organization, necessary applications and equipment for production management and customer service. Basic theory and

use of office computers for word processing, spreadsheet, database and presentation applications. Practice of proper start-up, file operations and maintenance procedures.

Corequisites: ENG 092R, ENG 092W, or CUNY proficiency in reading, writing and mathematics

**GRA 1209
Impositions, Plates and Proofs**

2 cl hr, 2 lab hrs, 3 cr
This course introduces fundamentals of imposition, color proofing and plate making, and places equal emphasis on techniques and quality assurance. Students learn correct procedures and gain practical, hands-on experience with a variety of specifications and industry-standard equipment. The electronic prepress workflow is described, from desktop workstation to output devices, for both conventional and digital printing. Discussions will address key technical issues, evaluation methods, printing associations, new technologies and important industry trends.

Prerequisites: GRA 1111, GRA 1150, GRA 2330, ADV 1161; Note: students pursuing a certificate are not required to take GRA 1150 or GRA 2330 which are listed as prerequisites for this class. For those students only, department approval will be sufficient

**GRA 1213
Black and White Presswork**

1 cl hr, 3 lab hrs, 2 cr
Operational principles of single color printing press production. Emphasis on learning the basic terminology, concepts and functions of the printing press in relationship to other factors in prepress and postpress operations. Lab work focuses on the functions of roller-groups, fountain solutions, feeding, delivery and safety controls. Students study and evaluate the characteristics and relationships among chemicals, plates, inks and stocks.

Pre- or corequisite: GRA 1111

**GRA 2300
Color Theory and Practice**

1 cl hr, 2 lab hrs, 2 cr
Fundamentals and theoretical aspects of color as used in graphic arts. Study of nomenclature, measurements, gamuts, models, separations, controls and production procedures in conventional and digital media. Practical production work by students includes calibrations for equipment to understand color management and

device profiles. Emphasis on: SNAP, GRACoL, SWOP and FIRST guidelines; ink on press sequences; separation screen angles; monitor variations; current industry trends such as device profiling to ICC lookup tables; calibration measurements, using densitometers, spectrodensitometers and spectrophotometers.

Prerequisites: GRA 1209, GRA 1213

**GRA 2301
Ink and Color Analysis**

1 cl hr, 2 lab hrs, 2 cr
The study of color inks in graphic arts production. Students practice proper ink mixing for color matches and measurements using densitometers, spectrodensitometers, spectrophotometers and other instruments specific to the investigation and understanding of ink technology. Discussions cover manufacturing; shelf life and storage considerations; handling and appropriate press usage; ink formulations of colorant, vehicle and additives. Color analysis includes ink and paper plus paper stock categories, specifications, usage, absorption and reflection qualities that affect color. Ink relationships to SNAP, GRACoL, SWOP and FIRST guidelines are identified.

Prerequisites: GRA 1209 GRA 1213; Corequisite: GRA 2300

**GRA 2303
Desktop Publishing Production I**

2 cl hrs, 2 lab hrs, 3 cr
Continued development of the skills and concepts from courses in typography and digital imaging, giving students the opportunity to plan and execute basic techniques for page assembly. The students plan, develop and execute pages ready for a variety of media with a focus on matching specifications to SNAP, GRACoL, SWOP and FIRST guidelines. This course focuses on creating integrity for output and guidelines for previewing final layouts (PreFlyt). Emphasis is directed to the proper use of keyboard controls. Software such as QuarkXpress, continuous tone pictures and vector art logo files on the Macintosh operating system are used.

Prerequisites: GRA 1150, GRA 1209, ADV 1161

**GRA 2313
Color Presswork**

2 cl hrs, 2 lab hrs, 3 cr
This course continues the development of printing skills and concepts. Students plan and execute process color printing projects and rotate through complete press

preparations on equipment such as a Heidelberg GTO press. Emphasis on make-ready, full-color images, registration, print coverage, trapping and quality.

Prerequisite: GRA 1213

**GRA 2316
Digital Imaging Production**

2 cl hrs, 2 lab hrs, 3 cr
An advanced course that continues to develop the ability to capture, color correct, adjust tonal levels and curves and retouch bitmapped images. Students learn how digital cameras and high-end scanners capture images and how to provide optimized 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 on the Macintosh operating system. The course is a priority for students planning to continue for the BTech degree.

Prerequisite: ADV 1260; Corequisite: GRA 2300

**GRA 2317
Graphic Arts Estimating I**

2 cl hrs, 2 lab hrs, 3 cr
A balance of basic estimating theory and practice tailored to the special needs of the graphic arts industries. The study of all phases of estimating from transactional analysis to the estimator's spreadsheet and the presentation of final estimates. This course introduces fundamental concepts of cost-based accounting and functions related to management information systems.

Prerequisites: GRA 1150, GRA 1209, GRA 1213

**GRA 2330
Digital Photography**

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: ADV 1162 or MTEC 1001 or IMT 1100; Corequisites: ENG 092R (ESOL 032R) and/or ENG 092W (ESOL 031W), as required.

**GRA 2406
Production Management Systems I**

2 cl hrs, 2 lab hrs, 3 cr
An overview of print production management and the problems facing modern graphic arts decision-makers in advertising, commercial printing, the internet and intranets, hardcover and softcover publishing, on-demand and variable data printing, wide format and portable document format production. Relationships are discussed between production and other factors such as deadlines, distribution, human resources, equipment and materials on-hand; development of scheduling plans and control procedures to maximize efficiency, manufacturing, quality controls and profits for organizations. Case studies and problem-solving exercises simulate competitive and internal environments.

Prerequisites: GRA 2303, GRA 2317

**GRA 2412
Desktop Presentations**

2 cl hrs, 2 lab hrs, 3 cr
Introduction to the principles and practice of desktop presentations. Integration of text, graphics and simple animation through the use of software such as Microsoft Powerpoint. Students complete business presentations based on graphic arts-related research.

Prerequisites: GRA 2303, ADV 1162

**GRA 2417
Graphic Arts Estimating II**

2 cl hrs, 2 lab hrs, 3 cr
Advanced study of estimating and its relationship to costs, measurements and profits. Application of estimating principles to purchasing, storage, preparation and sales of graphic arts goods and services. Review of the yearly, monthly and weekly cost determination. Inventory turnover, cost centers, forecasting and control methods as well as comparison of actual and estimated costs. An emphasis is placed on real-world policies, procedures and applications used in current industry cost-based accounting for management information systems. This course is a priority for students planning to continue for the BTech degree.

Prerequisite: GRA 2317

**GRA 2419
Quality Control Management Systems**

2 cl hrs, 2 lab hrs, 3 cr
An introduction to total quality management guidelines and concepts including both analog and digital operations. An emphasis is

focused on quality control programs; statistical process controls; setting standards, tolerances and their random variations; SNAP, GRACoL, SWOP and FIRST guidelines; material testing; ANSI standards; light variables; copy variables; metamerism, densitometry, colorimetry and spectrophotometry, color proofing processes; role of Preflyting; pressroom variables; evaluating color bar ink traps, dot gain and print contrast; quality management, customer service and scheduling.

Prerequisites: GRA 2300, GRA 2301

GRA 2900
Graphic Arts Internship
AAS degree

2 cl hrs, 120 field hrs/semester, 3 cr

Assignment to fieldwork/study situations of approximately eight hours per week at a graphic arts-related internship site approved by the department internship director. Sites may be in areas such as advertising, printing, corporate communications or publishing. Students keep a log/journal to be shared in group seminars.

Supervision by faculty and by the supervisor at the internship site.

Prerequisite: GRA 2317 or department approval required

GRA 3508
Desktop Publishing
Production II

2 cl hrs, 2 lab hrs, 3 cr

An advanced course that continues to develop page assembly for a variety of media. Students learn how to master preferences, paragraph formats, tabs, style sheets, step and repeats, box shapes and color traps. Students are exposed to professional techniques for making corrections and altering final layouts to match a client's instructions. Software such as QuarkXpress and files representing bitmapped digital images and vector art logos are used on the Macintosh operating system.

Prerequisite: GRA 2303

GRA 3513
Digital Color Presswork

2 cl hrs, 2 lab hrs, 3 cr

Continues the development of digital printing skills and concepts, giving students the opportunity to plan and produce full-color digital printing projects. Students use a digital printer such as the Xerox DocuColor 2060 to learn how to merge marketing data into layouts to produce variable data materials in color. An emphasis is placed on safety, maintenance and calibration for digital color presswork systems.

Prerequisite: GRA 2313

GRA 3515
Production Management
Systems II

1 cl hr, 2 lab hrs, 2 cr

Interaction between design and production to meet industry requirements is studied to help prepare students for advertising, printing or publishing. Discussions and exercises covering conditions, deadlines, standards, materials, personnel, asset management and equipment, development of skills necessary for scheduling and preparation of job "tickets" and "bags." Also covers a survey of print production organization charts, traffic procedures in advertising, printing and publishing and comparisons of their differences and similarities.

Prerequisites: GRA 2406, GRA 2419

GRA 3516
Binding and Finishing
Operations

1 cl hr, 2 lab hrs, 2 cr

An introduction to the operation and management of bindery services such as adhesive, coil, comb, loop stitch, notch, perfect, receipt-book, saddle stitch, sewn, spiral and wire-o binding and padding. Also included are finishing services such as counting, numbering, collating, spot gluing/tipping, cutting, indexing, stamping/embossing, drilling, scoring and folding, coating, laminating, die-cutting, eyeletting, imprinting, polybagging, inserting, labeling, stringing and tubing. An emphasis is placed on specifications for material preparation, deadlines and schedules, production decisions and purchasing requirements.

Prerequisite: GRA 1209

GRA 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: ADV 3500 or ADV 3501 or department approval

GRA 3607
Digital Data Asset
Management

2 cl hrs, 2 lab hrs, 3 cr

Students study the characteristics of various data forms and how they can be managed by sort fields or tags to work with situations such as archiving, repurposing of information, direct mail, electronic commerce, variable data publishing, etc. A focus is on organizing and maintaining assets, configuration and updating strategies, data distribution, reports, etc. An orientation to flat-file database systems using applications such as Microsoft Access, and migration of data to relational database systems. By the end of the course, students should be able to identify various data asset needs, match appropriate systems to the needs, develop and maintain a digital data asset database.

Prerequisites: GRA 3508, GRA 3515

GRA 3611
Vector Art Editing

2 cl hrs, 2 lab hrs, 3 cr

An advanced course that continues to teach how to create, correct and modify logos and logotype vector linework. Students learn how to simplify path points and specify the flatness value for printer pixels to provide optimized files. Students are exposed to professional techniques and tools for making corrections and altering art to match a client's instructions using software such as Adobe Illustration on the Macintosh operating system.

Prerequisite: ADV 1162

GRA 3612
Print-On-Demand
Management

2 cl hrs, 2 lab hrs, 3 cr

Digital publishing taught as an alternative to conventional offset printing. A study of print-on-demand (POD) terminology and techniques includes distributed POD networks and satellite operations versus reprographic centers, remote proofing, personalization and customization applications, controller software, optical-character-recognition (OCR), storage, image processing, in-line finishing, accounting and on-line customer service capabilities. Demonstration of POD hardware, software and workflows. Consideration of format, design and finish as factors in POD output versus conventional offset printing.

Prerequisite: GRA 3515

GRA 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: GRA 3515

GRA 4712
Portable Document Formats

1 cl hr, 2 lab hrs, 2 cr

Development of final pages into a portable document format (PDF) for preview, document distribution, output for printing and cross-platform publishing. Students learn how to simplify PostScript files, determine and set preferences, build hot links for multiple-page documents, verify a file's quality, and modify an existing PDF. Students are exposed to professional techniques to match a client's instructions.

Software such as Adobe Acrobat and Enfocus Instant PDF are used on the Macintosh operating system.

Prerequisite: GRA 3508

GRA 4715
Project Management and
Workflow Analysis

1 cl hr, 2 lab hrs, 2 cr

A study of management rationale in graphic arts production using project planning management applications and PERT or GANNT charts. Problems or costly situations are identified using strategic methods such as abstract summary, measurable objectives, financial considerations, inventory of resources, observations and recommendations. Students focus on making project plans, then evaluate workflow maps using five markers: review, decision, process, transfer and action. This course changes theoretical concepts into realistic production systems, getting graphic arts jobs done by using predictable, reliable and profitable processes. Focus is on cost, profit centers and sustainability in graphic arts operations.

Prerequisites: GRA 3515, GRA 3612

GRA 4732**Digital PreFlyt***2 cl hrs, 2 lab hrs, 3 cr*

A practical problem-solving approach to various situations occurring in previewing final layouts for production. A variety of quality-assurance methods are used, such as ripping to proofs for visual analysis and reading file codes or tags. Students work with realistic problem files to identify and fix errors such as missing or incorrect fonts, incorrectly defined colors, missing or incorrect color traps, scans supplied in the wrong file format and/or incorrect resolution, graphics not linked or missing, incorrect page settings and/or page set up and/or poorly defined or undefined safety/trim/bleed, inaccurate or missing proofs, inability to output and poorly defined or undefined submission materials. Students use software and hardware to gain real-world experience.

*Prerequisite: GRA 3508***GRA 4800****The Graphic Arts Production Team***2 cl hrs, 2 lab hrs, 3 cr*

An advanced course demonstrating the principles of professional teamwork and networking. Graphic arts degree candidates work with design students to produce communications materials such as posters, publication pages, brochures, book covers, etc. GA students consult with design instructors and students, abstract relevant articles from industry and trade publications, and develop professional contacts in industry associations.

*Prerequisites: GRA 4715, GRA 4732 or department approval***GRA 4817****Estimating and Cost Control Systems Management***3 cl hrs, 3 cr*

A study of graphic arts information technologies that help provide estimating, production and accounting data that are evaluated to make management decisions. Students develop management strategies after calculating realistic financial, personnel and environmental factors. The results of the course should help students identify sustainability strategies in graphic communications.

*Prerequisites: GRA 2417, GRA 3515, GRA 4715 or department approval***GRA 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: GRA 4800; Corequisite: GRA 4715***GRA 4900****Graphic Arts Internship****BTech degree***2 cl hrs, 120 field hrs/semester, 3 cr*

Assignment to fieldwork/study situations of approximately eight hours per week at a graphic arts-related internship site approved by the department internship director. Sites may be in areas such as advertising, printing, or publishing. Students keep a log/journal to be shared in group seminars. Supervision by faculty and the supervisor at the internship site.

Prerequisites: GRA 4715, GRA 4732 or department approval

Architectural Technology

Professor Shelley E. Smith, Chair
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 718.260.5262
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PROGRAMS:

Architectural Technology/AAS
 Architectural Technology/BTech
 Sustainable Technology/Certificate

FACULTY:

Professors: Berensmann, Maldonado
 Associate Professors: Azaroff, Bouratoglou, Edwards, Smith,
 Zagaroli
 Assistant Professors: Aptekar, Beita, Conzelmann,
 Dikigoropoulou, Duddy, King, Leonhardt, Mishara, Montgomery,
 Vaidya

CLTs: Baez, Velasco

Associate in Applied Science in ARCHITECTURAL TECHNOLOGY

The Architectural Technology program, the only one 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 pre-professional program familiarizes students with up-to-date architectural office practices and procedures including computer-aided design and drafting. Studio work gives the students the opportunity to develop their talents by participating in various architectural projects from inception to final drawings and models.

There is a four-year Bachelor of Technology (BTech) degree program and a two-year associate degree (AAS) program. The BTech degree has an emphasis on restoration and renovation of existing New York City buildings. Students enrolled in the AAS degree may transfer directly into the Bachelor of Technology degree program at any time upon meeting the requirements or upon completion of the AAS degree program at City Tech. Graduates of the AAS degree program who want a strong emphasis in design may transfer to a five-year architectural college. Interested students should consult a departmental advisor before completing their second semester.

A partial listing of positions that graduates of this program will qualify for includes architectural technician, CAD drafter, architectural renderer, architectural model maker, manufacturer's representative, 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 competent for entry-level employment in the architectural field, having a breath 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.

Additional Costs other than Tuition and College-wide Fees (Approximate):

Textbooks.....	\$400
Professional Tools.....	\$300
Project Materials and Supplies.....	\$200
Portfolio Preparation.....	\$100

REQUIRED COURSES IN THE MAJOR		Credits
ARCH 1110	Architectural Design I: Foundations	3
ARCH 1121	History of Architectural Technology	2
ARCH 1130	Building Technology I	3
ARCH 1191	Visual Studies I	2
ARCH 1210	Architectural Design II: Foundations	3
ARCH 1230	Building Technology II	3
ARCH 1250	Site Planning	2
ARCH 1291	Visual Studies II	2
ARCH 2310	Architectural Design II	4
ARCH 2330	Building Technology III	4
ARCH 2370	Building Systems	3
ARCH 2410	Architectural Design IV	4
ARCH 2430	Building Technology IV	3
ARCH 2480	Principles of Stability in Structures	3
AAS Capstone		
If total credits in the major are less than 44, choose one of the following upper level courses		
ARCH 3550	Building Performance Workshop	3
ARCH 3590	Parametric Computation, Materials and Fabrication	3
ARCH 3662	Government Regulations and Approvals	3
Subtotal		44
ASSOCIATE DEGREE CORE		
ENG 1101	English Composition I	3
MAT 1275 ²	College Algebra and Trigonometry	4
PHYS 1433	Physics 1.2	4
or		
PHYS 1441	Physics 1.3	5
PHYS 1433L	Physics 1.2 Lab	0
or		
PHYS 1441L	Physics 1.3 Lab	0
LAP ¹	Arch 2321 History of Architecture 1900 to the Present	3
BS/SS ¹	Introductory Behavioral Science or Social Science	3
COMM ¹	Writing or Speech	3
Subtotal		20-21
TOTAL CREDITS REQUIRED FOR THE DEGREE		min. 64
<i>1 See page 35 for a detailed explanation of core-required courses and categories.</i>		
<i>2 Students without the requisite math background to enter MAT 1275 may be required to take MAT 1175 in preparation. This will increase the number of required credits for the degree by four (4).</i>		

Curriculum by Semester

For students earning an Associate in Applied Science (AAS) degree with a major in architectural technology.

FIRST SEMESTER		Credits
ARCH 1110	Architectural Design I: Foundations	3
ARCH 1130	Building Technology I	3
ARCH 1191	Visual Studies I	2
ENG 1101	English Composition I	3
MAT 1275 ²	College Algebra and Trigonometry	4
Subtotal		15
SECOND SEMESTER		
ARCH 1121	History of Architectural Technology	2
ARCH 1210	Architectural Design II: Foundations	3
ARCH 1230	Building Technology II	3
ARCH 1250	Site Planning	2
ARCH 1291	Visual Studies II	2
PHYS 1433	Physics 1.2	
or		
PHYS 1441	Physics 1.3	4-5
PHYS 1433L	Physics 1.2L	0
or		
PHYS 1441L	Physics 1.3L	0
Subtotal		16
THIRD SEMESTER		
ARCH 2310	Architectural Design III	4
ARCH 2330	Building Technology III	4
ARCH 2370	Building Systems	3
LAP ¹	Arch 2321 History of Architecture 1900 to the Present	3
COMM ¹	Communications	3
Subtotal		17
FOURTH SEMESTER		
ARCH 2410	Architectural Design IV	4
ARCH 2430	Building Technology IV	3
ARCH 2480	Principles of Stability in Structures	3
BS/SS ¹	Behavioral Science or Social Science	3
CAPSTONE	AAS Capstone (choose one)	3
Subtotal		16
TOTAL CREDITS REQUIRED FOR THE DEGREE		64
<i>1 See page 35 for a detailed explanation of core-required courses and categories.</i>		
<i>2 Or higher-level Mathematics course.</i>		
AAS Capstone Credits		
If total credits in the major are less than 44, choose one of the following upper level courses		
ARCH 3550	Building Performance Workshop	3
ARCH 3590	Parametric Computation, Materials, and Fabrication	3
ARCH 3662	Governmental Regulations and Approvals	3

Bachelor of Technology in ARCHITECTURAL TECHNOLOGY

City Tech's bachelor's degree program in architectural technology is the only program of its kind in New York State. It prepares the student to be proficient in 21st century technologies that are required to manage all phases of professional practice in an architectural office.

The pre-professional bachelor's degree focuses on the latest technologies currently being used in the renovation, restoration and preservation of existing buildings. The program provides a basic understanding and the practical skills needed to function in an architectural office.

Our program thoroughly familiarizes the student with up-to-date architectural office terminology, practices and procedures including computer-aided drafting and design (CAD) techniques. Studio work gives students an opportunity to develop their own ideas and creative talents through participation in architectural projects from inception to final presentation drawings and the construction of models. As graduates, the students are well equipped to be a part of an architectural design team in a broad range of planning and construction coordination roles.

Graduates from our bachelor's degree program will be qualified to work as project managers or job captains in architectural offices. They are provided with immediately marketable skills and a solid foundation for career advancement. Graduates of this program are qualified to go on to apply for a master's degree in architecture (MArch).

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.
- 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.

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

REQUIRED COURSES IN THE MAJOR		Credits
AAS Degree in Architectural Technology		64
ARCH 3510	Architectural Design V	4
ARCH 3561	Architectural Office Management	3
ARCH 3610	Architectural Design VI	
	or	
ARCH 3630	Advanced Detailing Studio	5
ARCH 4710	Architectural Design VII: Urban Design	5
ARCH 4740	Detail and Construction Technologies for Existing Buildings (The course is not required for students who take ARCH 3630)	3
ARCH 4810	Architectural Design VIII: Special Topics	
	or	
ARCH 4830	Construction Technology: Special Topics	5
ARCH 4880	Survey of Structural Systems and Building Infrastructure	3
	Subtotal	24-27
BTech ELECTIVES/REQUIREMENTS		Credits
Select two to four of the following courses for a total of 77 credits in the major (AAS and BTech courses in the major combined)		
ARCH 3522	History of New York City Architecture	3
ARCH 3550	Building Performance	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	Advance 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 4709	Advanced 3D Modeling and Rendering	3
ARCH 4740	Detail and Construction Technologies for Existing 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
	Subtotal	12

GENERAL EDUCATION COMMON CORE DISTRIBUTION

MAT 1375 ²	Precalculus	4
PHYS 1434	Physics 2.2 or	
PHYS 1442	Physics 2.3	4
PHYS 1434L	Physics 2.2 Lab or	
PHYS 1442L	Physics 2.3 Lab	0
COMM	Writing or Speech	3
LIT ¹	Literature Course	3
LAP ¹	Literature or Aesthetics or Philosophy	3
BS/SS ¹	Introductory Behavioral Science or Social Science	3
	Advanced Behavioral Science or Social Science	3
	Subtotal	23-24

TOTAL CREDITS REQUIRED FOR THE BTech DEGREE 120

*1 See page 35 for a detailed explanation of core-required courses and categories.
2 Or higher-level Mathematics course.*

BS/SS ¹	Behavioral Science or Social Science	3
	Subtotal	15-16

EIGHTH SEMESTER

ARCH 3561	Architectural Office Management	3
ARCH 4810	Architectural Design VIII: Special Topics or	5
ARCH 4830	Construction Technology: Special Topics	5
ELECTIVE	BTech Elective	3
LIT ¹	Literature Course	3
	Subtotal	14

TOTAL CREDITS REQUIRED FOR THE DEGREE min. 120

*1 See page 35 for a detailed explanation of core-required courses and categories.
2 Or higher-level Mathematics course.*

Curriculum by Semester

For students earning a Bachelor of Technology (BTech) degree in architectural technology.

Certificate in SUSTAINABLE TECHNOLOGY

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FIFTH SEMESTER		Credits
ARCH 3510	Architectural Design V	4
ARCH 3522	A History of New York City Architecture	3
ARCH 4880	Survey of Structural Systems and Building Infrastructure	3
COMM ¹	Communications (Writing or Speech)	3
LAP ¹	Literature or Aesthetics or Philosophy	3
	Subtotal	16

SIXTH SEMESTER

ARCH 3610	Architectural Design VI or	
ARCH 3630	Advanced Detailing Studio	5
MAT 1375 ²	Precalculus	4
ELECTIVE	BTech Elective	3
BS/SS ¹	Behavioral Science or Social Science	3
	Subtotal	15

SEVENTH SEMESTER

ARCH 4710	Architectural Design VII: Urban Design	5
ARCH 4740	Detail and Construction Technologies for Existing Buildings or (for students who have taken ARCH 3630), any	
ELECTIVE	BTech Elective	3
PHYS 1434	Physics 2.2 or	
PHYS 1442	Physics 2.3	4-5

COURSES:**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.

*Co-requisite: ARCH 1191***ARCH 1121
History of Architectural
Technology
(Writing Intensive)***2 cl hrs, 2 cr*

The study of architectural technology from prehistoric times to the present stressing the development of structural systems and the exploration of materials. This course will explore the interaction of building design and historic socio-economic determinants.

Prerequisites: CUNY proficiency in Reading and Writing; OR CUNY proficiency in Reading with co-requisite of ENG 092W if part of a learning community; 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, 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 a high school recommendation.

**ARCH 1130
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 from foundation to roof as well as the study of material properties and applications with an emphasis on wood and masonry and shallow foundation systems.

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.

**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.

*Co-requisite: ARCH 1110***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; Co-requisite: ARCH 1291

**ARCH 1230
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 building information modeling (BIM) techniques, and professional level construction drawing.

Prerequisite: ARCH 1130 with a grade of C or higher

**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 1130 with a grade of C or higher; Pre- or corequisites: MAT 1275 or higher, ARCH 1210 with a grade of C or higher if it is a prerequisite

**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; Co-requisite: ARCH 1210

**ARCH 2310
Architectural Design III***1 cl hr, 6 lab hrs, 4 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 1210 and ARCH 1291, both with a grade of C or higher; Pre- or co-requisite: ARCH 1250

**ARCH 2321/ARTH 2321
History of Architecture:
1900 to the Present****AES Core
(Writing Intensive)***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 2330
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.

Prerequisite: ARCH 1230 with a grade of C or higher

**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 2410
Architectural Design IV***1 cl hr, 6 lab hrs, 4 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 2310 with a grade of C or higher; Pre- or Co-requisite: ARCH 2321

**ARCH 2430
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 on steel framed structures and creates a set of working drawings. Emphasis is on communication and collaboration skills necessary in the professional office.

Prerequisite: ARCH 2330 with a grade of C or higher

**ARCH 2480
Principles of Stability in Structures**

3 cl hrs, 3 cr
The analysis of architectural structures and their materials. A study of wood and steel structures using basic physical laws, the behavior of architectural materials in stress and intuitive reasoning related to the mathematical treatment of equilibrium in static structures.

Prerequisites: MAT 1275 or higher, ENG 1101; Pre- or corequisite: 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 2410 with a grade of C or higher or an AAS degree in an architecturally-related field.

**ARCH 3522
A History of New York City Architecture
(Writing Intensive)**

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 3550
Building Performance Workshop**

3 cl 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 3561
Architectural Office Management**

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 24300 with a grade of C or higher

**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, ARCH 1291, 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

**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

**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 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 3510 with a grade of C or higher, ARCH 2430, ARCH 2480

**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; Pre- or co-requisite: ARCH 2430*

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, ARCH 2430); or AAS degree in Architecture or equivalent; Co-requisites: 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 4709 Advanced 3D Modeling and Rendering

3 cl hrs, 3 cr

This elective course focuses on 3-dimensional 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. *Prerequisites: ARCH 3591 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, either with a grade 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*

ARCH 4780 Case Studies in Structural Engineering

1 cl hr, 4 lab/studio hrs, 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 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. *Prerequisite: ARCH 4710 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 fieldtrips 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; Co-requisite: ARCH 3510 or ARCH 3610 or ARCH 3630 or ARCH 4710 or ARCH 4810 or ARCH 4830*

**ARCH 4880
Survey of Structural Systems
and Building Infrastructure**

3 cl hrs, 3 cr

Emphasis is placed on the theoretical and practical application of structural design principles for new and existing steel and concrete structures. The behavior of these various materials under stress, and the proper selection of each, will be discussed. Conditions encountered during renovations and their solutions will be included. The appropriate integration of the mechanical systems (HVAC, plumbing and electrical) for each of these structural applications will be examined.

Prerequisites: ARCH 2480, MAT 1375 or higher, PHYS 1434 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 3690

**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 and approval of internship director

Computer Engineering Technology

Professor Aparicio Carranza, Chair
 Voorhees Hall, room V 633
 718.260.5885
 email: acarranza@citytech.cuny.edu

PROGRAMS:

Electromechanical Engineering Technology/AAS
 Computer Engineering Technology/BTech

FACULTY:

Professors: Razukas, Woytowich
 Associate Professors: Blank, Carranza
 Assistant Professors: Heng, Kwon, Li, Mendoza, Morton, Philipp,
 Reyes-Alamo, Wang, Zia
 Lecturer: Armstrong

CLTs: Carrington, 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 titles: field engineer, computer-repair technician, business machines technician, data processing equipment specialist, electromechanical technician, laboratory technician, production assembly technician, biomedical instruments service technician and robotics service technician.

Manufacturers and users of computers and electromechanical equipment are potential employers of graduates. Among the employers of the graduates of this program are IBM, Verizon, ConEdison, Canon, Eastman Kodak, the Metropolitan Transportation Authority, Xerox Corp and the elevator industry.

Accreditation

The electromechanical engineering technology curriculum is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET), 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: 410.347.7700.

Program Outcomes

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.

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.

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.

Effective Spring 2008

REQUIRED COURSES IN THE MAJOR		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	Digital Control	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	3
Subtotal		36
ADDITIONAL REQUIRED COURSES ¹		
ENG 1101	English Composition I	3
MAT 13752	Precalculus	4
MAT 1475	Calculus I	4
PHYS 1433	Physics 1.2	4
	or	
PHYS 1441	Physics 1.3	5
PHYS 1434	Physics 2.2	4
	or	
PHYS 1442	Physics 2.3	5
Subtotal		19-21

REMAINING CORE DISTRIBUTION

COMM ¹	Communications ENG 1121 or ENG 1133	3
LAP ¹	Literature/Aesthetics/Philosophy	3
BS/SS ¹	Behavioral Science/Social Science	3
Subtotal		9

TOTAL CREDITS REQUIRED FOR THE DEGREE 64-66

¹ See page 35 for a detailed explanation of core-required courses and categories.

² 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).

³ Choose from CST 2403 Intro C++ Programming Language I or CET 3910 Mechanicals of Materials.

FOURTH SEMESTER

EMT 2455	Data Communications	2
EMT 2461	Electromechanical Systems: Software Interface	2
EMT 2480L	Electromechanical Systems Lab	1
PHYS 1434 ¹	Physics 2.2	4
or		
PHYS 1442	Physics 2.3	5
BS/SS ¹	Behavioral Science/Social Science	3
	Technical Elective ³	3

Subtotal 15-16**TOTAL CREDITS REQUIRED FOR THE DEGREE 64-66**

¹ See page 35 for a detailed explanation of core-required courses and categories.

² 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).

³ Choose from CST 2403 Intro C++ Programming Language I or CET 3910 Mechanicals of Materials

Curriculum by Semester

For students earning an Associate in Applied Science (AAS) degree.

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 ²	Precalculus	4
ENG 1101	English Composition I	3
Subtotal		15

SECOND SEMESTER

EMT 1220	Mechanisms	4
EMT 1250	Digital Control	4
EMT 1255	Electronics	4
PHYS 1433	Physics 1.2	4
or		
PHYS 1441	Physics 1.3	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
COMM ¹	Communications ENG 1121 or ENG 1133	3
LAP ¹	Literature/Aesthetics/Philosophy	3
Subtotal		18

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. This program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET).

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.

Program Outcomes

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

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.

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 where they are part of.

Statement of requirements for the Bachelor of Technology (BTech) in computer engineering technology (Effective Spring 2008)

REQUIRED COURSES IN THE MAJOR		Credits
AAS Degree (in either EMT, EET/TCET or MECH) or an Acceptable Equivalent		64
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 for students with AAS in EET/TCET)	4
CET 4773	Microcomputer Interfacing	4
CET 4805	Component and Subsystem Design II	2
CET 4811	Computer Controlled System Design II	2

CET 4864	Feedback Controlled Systems	4
	Technical Elective ³	4
	(Required only for students with AAS in EMT or EET/TCET)	
	Technical Elective ⁴	3
	(or Internship or CST 2403)	
Subtotal		39

ADDITIONAL REQUIRED COURSES

ENG 1121	English Composition II (or higher) ⁵	
MAT 1575	Calculus II	4
MAT 2580	Introduction to Linear Algebra	3
MAT 2680	Differential Equations	3
Subtotal		10

REMAINING CORE DISTRIBUTION¹

COMM ²	SPE 1330/TS 300 Series (Speech)	3
BS/SS ^{1 and 6}	Behavioral Science/Social Science	6
AES/PHIL	Aesthetics/Philosophy	3
LIT	Literature	3
Subtotal		15

TOTAL UPPER DIVISION CREDITS REQUIRED FOR THE DEGREE 64

TOTAL CREDITS REQUIRED FOR THE DEGREE 128

¹ See page 35 for a detailed explanation of the baccalaureate core courses and categories.

² Students who have not successfully completed ENG 1121 or higher must do so. This may add an additional 3 credits to the number of credits required for graduation

³ Select from CET 3910, CET 4900 series, CST 3500 or higher, or TCET 3100 or higher, with departmental permission

⁴ Students who did not receive associate degree credit for CST 2403 (or an approved equivalent) must take CST 2403. Otherwise, select from CET 3910, CET 4900 series, CST 3500 or higher, or TCET 3100 or higher, with departmental permission.

⁵ Taken as part of the AAS program. Other transfer students who have not taken this course (or an approved equivalent) at the AAS level must do so on a non-contributory basis.

⁶ A one-year sequence in either behavioral science or social science is required. See page 35 for a detailed explanation of the baccalaureate core and categories.

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, 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.

Curriculum by Semester

FIFTH SEMESTER		Credits
CST 2403	Intro C++ Programming Language I	3
MAT 1575	Calculus II	4
CET 3510	Microcomputer Systems Technology	4
COMM ¹	Communications Elective	3
BS/SS ¹	Behavioral Science/Social Science	3
Subtotal		17
SIXTH SEMESTER		
MAT 2580	Intro 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
LAP ¹	Literature/Aesthetics/Philosophy	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	Microcomputer Interfacing	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	
BS/SS ¹	Behavioral Science/Social Science (Advanced) 3	
LIT ¹	Literature: any ENG 2000 series, AFR, PRS 2200 series	3
Subtotal 14		
TOTAL CREDITS		64

¹ See page 35 for a detailed explanation of core-required courses and categories.

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
CST 2403	Intro C++ Programming Language I	3
MAT 1575	Calculus II	4
CET 3525	Electrical Networks	4
CET 3550	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
COMM ¹	Communications Elective	3
BS/SS ¹	Behavioral Science/Social Science	3
Subtotal		18
SEVENTH SEMESTER		
MAT 2580	Intro 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	Microcomputer Interfacing	4
LAP ¹	Literature/Aesthetics/Philosophy	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
BS/SS ¹	Behavioral Science/Social Science (Advanced)	3
LIT ¹	Literature Elective	3
Subtotal		14
TOTAL CREDITS		64

¹ See page 35 for a detailed explanation of core-required courses and categories.

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
COMM ¹	Communications Elective	3
Subtotal		15
SIXTH SEMESTER		
MAT 2580	Intro 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
BS/SS ¹	Behavioral Science/Social Science	3
Subtotal		17
SEVENTH SEMESTER		
CET 4705	Component and Subsystem Design I	2
CET 4711	Computer-Controlled Systems Design I	2
CET 4773	Microcomputer Interfacing	4
CET	Technical Elective	4
BS/SS ¹	Behavioral Science/Social Science (Advanced)	3
LAP ¹	Literature/Aesthetics/Philosophy	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
LIT ¹	Literature: any ENG 2000 series, AFR, PRS 2200 series	3
Subtotal		14
TOTAL CREDITS		64

Note: This schedule assumes that CST 2403 was completed as part of the AAS program.

¹ See page 35 for a detailed explanation of core-required courses and categories.

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

EMT 1250 Digital Control

3 cl hrs, 3 lab hrs, 4 cr
Students learn how to implement and analyze control functions and arithmetic operations using digital IC's. Computer techniques are used to simulate systems and for troubleshooting. Laboratory problem-solving through the synthesis, breadboarding and testing of such systems. State-of-the-art integrated circuits are used with students working with their individual digital trainers.
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

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 11250

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 2455 Data Communications

1 cl hr, 2 lab hrs, 2 cr
This course introduces the foundations of data communications with applications in engineering technology. It provides a basic understanding of data communication systems and practical examples of communications networks. Topics include core network concepts, standards, physical layer propagation, a small Ethernet PC network, other LAN technologies, Wide Area Networks (WANs), TCP/IP internetworking, security, network management and systems administration, and network applications for computer-based control of devices.
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

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, ENG 1101

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; *Pre- or corequisites:* CST 2403, MAT 1575

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, 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, 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 to the modeling and solution of advanced problems in engineering technology. This course is coordinated with MA 680 Differential Equations.
Prerequisite: MAT 1575 with a grade of C or higher; *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: CST 2403, CET 3510

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

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
Modem 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.
Prerequisites: MAT 2680, CET 3625, both with grades of C or higher, CET 3510; *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, MA 680 and CET 3625, all with grades of C or higher

CET 4773 Microcomputer Interfacing

3 cl hrs, 3 lab hrs, 4 cr
Electronic interfacing technologies and techniques required to connect computers to internal and external systems and other computers and components. Topics include Local

Area Networks (LAN) and Wide Area Networks (WAN), timing and control signals, I/O requirements, bus standards and protocols.

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 EM 711, 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 and stability criteria. Lab work includes the use of mathematical analysis and simulation.

Prerequisites: MAT 2680, CET 4762; *Corequisites:* CET 3625, CET 4805

**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, 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 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

**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, 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, 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 1255, PHYS 1434

**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 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

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PROGRAMS:

Computer Information Systems/AAS
Computer Systems/BTech

FACULTY:

Professor: Braneky, Cabo
Associate Professors: Bellehsen, H. Li, X. Li, Malyuta, Pinto
Assistant Professors: Elhadary, Hristova, Moody, Oudjehane,
Sabbah, Satyanarayana, Shahidullah, Shen
Lecturers: Archibald, Holley, Milonas, Simmons, Viglina

CLTs: Duong, Graham, Liu, Rodney

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.
- Incorporating a modular curriculum structure that permits the curriculum to be adjusted and modified 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 MST and/or 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.

REQUIRED COURSES IN THE MAJOR		Credits
CST 1100	Introduction to Computer Systems	3
CST 1101	Problem Solving with Computer Programming	3
CST 1215	Operating Systems Fundamentals	3
CST 1201	Programming Fundamentals	3
CST 1204	Database Systems Fundamentals	3
CST 2307	Networking Fundamentals	3
CST 2309	Web Programming I	3
CST 2400/ ETN 2400	Computer Systems Management and Support	3
Subtotal		24
Select two of the following electives for 6 credits		
CST 2301	Multimedia and Mobile Device Programming	3
CST 2409	Web Programming II	3
CST 2406	Introduction to Systems Analysis and Design	3
CST 2415	System Administration (UNIX/Linux)	3
CST 2405	System Administration (Windows)	3
CST 2900	AAS Internship	3
Subtotal		6
ADDITIONAL REQUIRED COURSES		Credits
ACC 1101	Principles of Accounting	4
BUS 2425	Business Management	3
MAT 1375 ¹	Precalculus	4
Subtotal		11

CORE COURSES ²		Credits
ENG 1101	English Composition I	3
ENG 1121	English Composition II	3
LAP	Literature, Aesthetics or Philosophy	3
Speech	SPE 1330, SPE 1335, or SPE 1340	3
BS/SS	Behavioral Science or Social Science	3
Elective A	Laboratory Science	4
Subtotal		19
TOTAL CREDITS REQUIRED FOR THE DEGREE		60

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 See page 35 for a detailed explanation of core-required courses and categories.

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 such as:

- Object-Oriented Systems Analysis and Design
- Programming Design and Unix
- Database Systems Design
- Networking
- Client/Server Technology
- Web Design
- Computer Security

The program's structures will allow for timely changes in specialization course offerings as the information technology field evolves. As our professional consulting board perceives a need in industry for expertise in some new area, an additional three-course module could be designed and offered as a supplementary elective option.

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.

REQUIRED COURSES IN THE MAJOR

AAS Degree		Credits
AAS Degree		60

Workplace Component

CST 4900	Internship or	3
CST 4905	Informations Systems Project	3

Students must complete all courses in any three of the following seven modules for 27 credits:

Programming Design and UNIX

CST 3513	Object Oriented Programming in Java	3
CST 3613	Advanced Object Oriented Programming in Java	3
CST 4713	Web Application Development in Java	3

Object-Oriented Systems Analysis and Design

CST 3506	Object-Oriented Systems Analysis	3
CST 3606	Object-Oriented Systems Design	3
CST 4706	Design of Object-Oriented Distributed Systems	3

Local Area Network

CST 3507	Advanced Single-LAN Concepts	3
CST 3607	Introduction to Local Area Network Connectivity	3
CST 4707	LAN-Internet Connection	3

Client/Server Technology

CST 3508	Design of Graphic User Interfaces	3
CST 3608	Distributed Application Processing	3
CST 4708	Client/Server Technologies	3

Database Systems Design

CST 3504	Design of Microcomputer Databases	3
CST 3604	Design of Distributed Databases	3
CST 4704	Data Warehousing	3

Web Design

CST 3519	XML Data Representation	3
CST 3619	Web Services Architecture	3
CST 4709	Installing and Maintaining Web Servers	3

Information Security

CST 3510	Computer Security	3
CST 3610	Network Security Fundamentals	3
CST 4710	Advanced Security Technologies	3

Subtotal **30**

ADDITIONAL REQUIRED COURSES		Credits
BUS 3525	Strategic Management	3
CST 4800	Project Management	3
CST 4801	Special Topics in Information Technology	1
PSY 2404	Personnel and Organizational Psychology	3
Subtotal		10
BACCALAUREATE CORE DISTRIBUTION ¹		
ENG 3773	Advanced Technical Writing	3
MAT 1475	Calculus I	4
LAP ¹	Literature/Aesthetics/Philosophy	3
LIT ¹	Literature Elective	3
BS/SS ¹	Behavioral Science/Social Science	3
SCI II ¹	Laboratory Science	4
Subtotal		20
TOTAL CREDITS REQUIRED FOR THE DEGREE		120

¹ See page 35 for a detailed explanation of core-required courses and categories.

COURSES:

CST 1100 Introduction to Computer Systems

2 cl hrs, 2.0 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 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 1100, CST 1101

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; 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 1100 and CST 1101

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

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/ETN 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.

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

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 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 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 Design of Microcomputer Databases

2 cl hrs, 2 lab hrs, 3 cr
This course provides a general introduction to database design. The three main phases in database design are covered; conceptual, using Entity Relational Diagram (ERD) and Unified Modeling Language (UML); logical, using relational model; and physical, using a Database Management System. The basics of relational data modeling (concepts of relation, attribute, primary key and foreign key) are reviewed, and mapping the conceptual model to the relational model is discussed. Advanced concepts of relational theory normalization and denormalization are included. Physical implementation is described with the help of a particular Relational Database Management System (RDBMS). The students must be familiar with SQL.

Prerequisites: CST 1204 or CST 2304 or MST 2304

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 is designed as a second local area network course. Its main points of reference are the various protocols used in the available network operating systems including Novell NetWare, Windows NT, UNIX. It also addresses TCP/IP protocols.

Building on a base of introductory network concepts, this course is 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. The student will be introduced to LAN-network topics including current technology and emerging trends. Third-party diagnostic tools will be presented together with native diagnostic utilities. The setting for the course will be a lab with multiple LANs, one of each two computers serving as a server and the other as a workstation. Each pair of students will be responsible for their individual LAN.

Prerequisites: CST 2307 or MST 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 3510 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.

(CST 2307 or MST 2307) and (CST 1215 or MAT 1205)

CST 3513 Object Oriented Programming in Java

2 cl hrs, 2 lab hrs, 3 cr

This course introduces fundamentals of object-oriented programming (OOP). Through intensive lab assignments, students will master the concepts and implementation of objects and classes, inheritance and polymorphism, abstract classes and interfaces. Building upon fundamental concepts of computer programming, students will implement OOP in the Java programming language, and learn to create GUI applications – basic event driven programming. Exception handling also will be introduced.

Prerequisite: CST 1201 with a grade of C or higher

CST 3519 XML Data Representation

2 cl hrs 2 lab hours, 3 cr

This course focuses on encoding documents in XML (eXtensible Markup Language), the tools and standards related to XML, XML tree structures, and technologies used to transform XML documents. These technologies include Xpath, DTD (Document Type Definition), XML Schema, and XSLT (eXtensible Stylesheet Language Transformation). Students will work on practical applications that process XML documents using the Document Object Model (DOM).

Prerequisite: CST 2309 with a grade of C or higher

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 Design of Distributed Databases

2 cl hrs, 2 lab hrs, 3 cr

This course is a continuation of the course "Design of Microcomputer Databases" (CST 3504). It concentrates on the physical design of databases, as well as the general introduction to the design of distributed relational databases. Such problems as database management, query processing, transaction management, reliability and security are discussed. Important issues of physical design including the distribution of the database, are discussed under different architectures of distributed information systems. Such aspects of distributed databases as fragmentation, allocation and replication of data are discussed in detail. The course covers the special problems that occur from the distribution of data semantic control, reliability and transaction management, as well as the techniques used to solve these problems.

Prerequisite: CST 3504

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 3506

CST 3607 Interconnectivity

2 cl hrs, 2 lab hrs, 3 cr

This course is designed for the student who has a firm foundation in supervision of a single local area network and needs to integrate several existing computers and network architectures into a Windows NT environment. The student will examine the several prominent network cabling standards, protocols and hardware devices used in most enterprise-wide networks. The course will teach how the most popular network operating systems solve various network

connectivity problems. And finally, it will describe the technologies for making enterprise networks reliable and manageable. The setting for the course will be a lab with multiple LANs, several NT servers, several NetWare servers and the remaining PC's acting as workstations.

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. The roles of firewalls, routers, switches and other network hardware in security are examined. Security considerations for transmission and storage media are discussed as well as network security topologies and Network Operating System vulnerabilities. In the lab, students will study how network attacks occur and how to defend against them.

Prerequisite: CST 3510

CST 3613 Advanced Object Oriented Programming in Java

2 cl hrs, 2 lab hrs, 3 cr

This course enhances the students' understanding of object-oriented programming and strengthens their programming ability to develop advanced GUI and Database applications. Students will learn to build applications with advanced GUI components such as menus, toolbars, dialogs and JTable, etc. and also to connect applications to databases and be able to execute SQL commands such as retrieving, deleting, and updating data. This

course will introduce students to the Java Collection Framework, including the Vector class, Stack class, Queues as well as the sorting and searching algorithms.

Prerequisite: CST 3513 with a grade of C or higher

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 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 Data Warehousing

2 cl hrs, 2 lab hrs, 3 cr

This course is designed to introduce the student to the principles of data warehousing. Through this course, students are taught how to plan and design a data warehouse and integrate its use through an organizational network. Theoretical and practical models are covered and extensive use is made of case studies as well as practical exercises to relate theory and practice.

Prerequisite: CST 3604

CST 4706 Design of Object-Oriented Distributed Systems

2 cl hrs, 2 lab hrs, 3 cr

This course introduces the concepts of designing systems for client/server implementation. Building on the concepts of object-oriented analysis and design, the principles of designing an enterprise-wide distributed information system will be explained. Business examples will be demonstrated using CASE tools. Topics will include technology architecture, data architecture, application architecture, distributed databases, connectivity, middleware and interoperability.

Prerequisite: CST 3606

CST 4707 The LAN - Internet Connection

2 cl hrs, 2 lab hrs, 3 cr

Students plan for and connect a hypothetical company's existing integrated LANs with the Internet and its resources. Study of Internet and Intranet protocols. Students will build a business case for interconnection. A needs assessment, user requirements and expectations assessment, hardware and software requirements, cost and benefits estimates, and end-to-end connectivity issues will be researched and documented. Student teams will implement actual connection and utilization of Internet resources.

Prerequisite: CST 3607

CST 4708 Client/Server Technologies

2 cl hrs, 2 lab hrs, 3 cr

The definitions, requirements, benefits and terminology of client/server computing. Topics in this course will cover the client and the server hardware and software components, defining the role and functions of each component; the architecture of distributed processing and the client/server technologies and emerging trends. Students will write applications embodying different forms of client/server relationships including a simple Web application.

Prerequisite: CST 3608

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 Web Application Development in Java

2 cl hrs, 2 lab hrs, 3 cr

This course is designed for students who have knowledge of object-oriented programming, developing GUI applications and the Collection Framework. Students will learn advanced GUI and web applications in Java. This course will provide a unified approach for developing web applications using both servlets and Java Server Pages (JSP). The course thoroughly covers the servlet specification, beginning with server configuration, basic syntax, the servlet lifecycle, form data, cookies, and session tracking. The course will also cover a wide array of advanced

Java programming techniques, including compressing Web content, incrementally updating results, dynamically generating images, and creating shopping carts. Additional topics will include the use of HTML forms and JDBC database access with servlets and JSP.

Prerequisite: CST 3603 or CST 3613 with a grade of C or higher

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. The roles of firewalls, routers, switches and other network hardware in security are examined. Security considerations for transmission and storage media are discussed as well as network security topologies and Network Operating System vulnerabilities. In the lab, students will study how network attacks occur and how to defend against them.

Prerequisite: CST 3510

CST 3613 Advanced Object Oriented Programming in Java

2 cl hrs, 2 lab hrs, 3 cr

This course enhances the students' understanding of object-oriented programming and strengthens their programming ability to develop advanced GUI and Database applications. Students will learn to build applications with advanced GUI components such as menus, toolbars, dialogs and JTable, etc. and also to connect applications to databases and be able to execute SQL commands such as retrieving, deleting, and updating data. This course will introduce students to the Java Collection Framework, including the Vector class, Stack class, Queues as well as the sorting and searching algorithms.

Prerequisite: CST 3513 with a grade of C or higher

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 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 Data Warehousing

2 cl hrs, 2 lab hrs, 3 cr

This course is designed to introduce the student to the principles of data warehousing. Through this course, students are taught how to plan and design a data warehouse and integrate its use through an organizational network. Theoretical and practical models are covered and extensive use is made of case studies as well as practical exercises to relate theory and practice.

Prerequisite: CST 3604

CST 4706 Design of Object-Oriented Distributed Systems

2 cl hrs, 2 lab hrs, 3 cr

This course introduces the concepts of designing systems for client/server implementation. Building on the concepts of object-oriented analysis and design, the principles of designing an enterprise-wide distributed information system will be explained. Business examples will be demonstrated using CASE tools. Topics will include technology architecture, data architecture, application architecture, distributed databases, connectivity, middleware and interoperability.

Prerequisite: CST 3606

CST 4707 The LAN - Internet Connection

2 cl hrs, 2 lab hrs, 3 cr

Students plan for and connect a hypothetical company's existing integrated LANs with the Internet and its resources. Study of Internet and Intranet protocols. Students will build a business case for interconnection. A needs assessment, user requirements and expectations assessment, hardware and software requirements, cost and benefits estimates, and end-to-end connectivity issues will be researched and documented. Student teams will implement actual connection and utilization of Internet resources.

Prerequisite: CST 3607

CST 4708 Client/Server Technologies

2 cl hrs, 2 lab hrs, 3 cr

The definitions, requirements, benefits and terminology of client/server computing. Topics in this course will cover the client and the server hardware and software components, defining the role and functions of each component; the architecture of distributed processing and the client/server technologies and emerging trends. Students will write applications embodying different forms of client/server relationships including a simple Web application.

Prerequisite: CST 3608

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 Web Application Development in Java

2 cl hrs, 2 lab hrs, 3 cr

This course is designed for students who have knowledge of object-oriented programming, developing GUI applications and the Collection Framework. Students will learn advanced GUI and web applications in Java. This course will provide a unified approach for developing web applications using both servlets and Java Server Pages (JSP). The course thoroughly covers the servlet specification, beginning with server configuration, basic syntax, the servlet lifecycle, form data, cookies, and session tracking. The course will also cover a wide array of advanced Java programming techniques, including compressing Web content, incrementally updating results, dynamically generating images, and creating shopping carts. Additional topics will include the use of HTML forms and JDBC database access with servlets and JSP.

Prerequisite: CST 3603 or CST 3613 with a grade of C or higher

CST 4714 Database Administration

2 cl hrs, 2 lab hrs, 3 cr

This course concentrates on the advanced issues of database management and administration. The course discusses what activities are needed to sustain reliable and secure database with good

performance. Managing of database storage (data, log and backup files), database objects (tables, indexes, clusters, etc) and procedural objects (triggers, stored procedures) for delivering the database properties mentioned above are discussed in detail. Also, such issues as security, administrating users and recourses, tuning the applications and monitoring the performance of database are included.

Prerequisite: CST 3604

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 4801 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 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

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 area network and today's issues of computer security.
Prerequisite: CUNY proficiency in reading, writing and mathematics

MST 1204 Database Systems and Programming

2 cl hrs, 2 lab hrs, 3 cr
This course introduces students to the principles and techniques of programming a relational database on the example of MS Access database management system. Special attention is dedicated to Structured Query Language (SQL), the standard language of programming relational databases. Students will learn how to create a database and tables, and how to manipulate (insert, update, delete and retrieve) data.
Prerequisites: CST 1100, CST 1101

MST 1205 Microcomputer Systems

2 cl hrs, 2 lab hrs, 3 cr
The operating system is the most fundamental program of any computer. It controls all the computer's resources and provides the base upon which the application programs can be written. This course provides an in-depth study of computer hardware and operating system concepts. Focus will be on the command line interface. Students will problem-solve using the command line interface in the Windows environment. Focus will be on command syntax, disk organization, writing simple to complex batch files, troubleshooting and connectivity with local and wide-area networks and analysis and backup of the Windows Registry.
Prerequisites: CST 1100, CST 1101

MST 2304 Database Systems and Programming II

2 cl hrs, 2 lab hrs, 3 cr
This course covers programming for microcomputer databases using a visual programming language external to the database. It covers all the features of the programming language needed to interact with and process the database including the data control and the data-aware controls. It includes the processing of tables and queries that have already been defined in the database using the database software. Students will run programming problems on a microcomputer using a recent version of the applicable software.
Prerequisite: MST 1204

MST 2307 Local Area Networks

3 cl hrs, 3 lab hrs, 4 cr
Study of the current standard local area network. Basic network concepts and the OSI model are discussed. Topics include topology, servers, workstations, printers

and other devices on the LAN, the network operating system, utilities, applications run on the network and LAN management. The network operating system Netware 5.1 is discussed: NDS, network file system, managing users and groups, security, printing, log-in scripts, operating server console. Each student will be given an account with Administrator privileges and will perform network administration tasks.
Prerequisites: MST 1205, MAT 1275

MST 2405 Microcomputer Operating Systems

3 cl hrs, 3 lab hrs, 4 cr
This is a study of microcomputer operating systems and the usage of selective features of popular microcomputer-based systems. The course introduces the operating systems concepts via study of MS DOS and MS Windows 2000. Main focus will be on Windows 2000 Server OS. Comparison topics cover the file system, processor management, memory management, device management. Other topics will cover multitasking, security, client/server systems, communications and networking support. All concepts will be demonstrated through laboratory assignments.
Prerequisites: MST 1205, MST 2307

Construction Management and Civil Engineering Technology

Professor Anthony Cioffi, P.E., Chair
Voorhees Hall, room V 434
718.260.5575
email: tcioffi@citytech.cuny.edu

PROGRAMS:

Civil Engineering Technology/AAS
Construction Management Technology/AAS
Construction Management/Certificate
Sustainable Technology/Certificate

FACULTY:

Professor: Cioffi
Associate Professor: Stegmaier
Assistant Professors: Norouzi, Shields, Villatoro

Senior CLT: Santiago

Associate in Applied Science in CIVIL ENGINEERING TECHNOLOGY

The curriculum in civil engineering technology is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC-ABET) as an engineering technology program. 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, and materials testing and surveying. Included in the curriculum are courses in the theory of structures, hydraulics, surveying, soils, materials testing and training for American Concrete Institute certification as Field Inspector (Level 1) of Fresh Concrete. 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, engineering technician, assistant project manager, surveyor, construction inspector and CAD operator.

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 Arnell Construction Co., Slattery Construction Co., Turner Construction Co., Future Tech Consultants, Forest City Ratner Corp., AECOM, Parsons Brinkerhoff, HNTB Engineers, Mercator Land Surveying, Cole Consulting, Greenman Peterson, STV Inc., Haks Engineers, Hazen and Sawyer 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 facilities management. See page 254 for a complete description of the BTech in Facilities Management. 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 Certificatio.....	\$250
OSHA 10 hr Certification.....	\$75
ACI Concrete Field Testing Certification.....	\$140
Certification Survey Technician.....	\$50

Alternate Format

Alternate format advanced placement is offered in civil engineering technology. Please consult the department for eligibility requirements and further information.

Accreditation

The Civil Engineering Technology AAS degree has been accredited by Technology Accreditation Commission of ABET (111 Market Place, Suite 1050, Baltimore MD 21202-4012, telephone 410.347.7700) since 1978. The CMCE Department has been utilizing TAC/ABET's Program Outcome Criteria to instill the skills, knowledge, and professionalism that ABET requires for accreditation. Upon graduation, our students will be able to demonstrate the following learning outcomes (Criterion 3):

- an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines,
- an ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology,
- an ability to conduct, analyze and interpret experiments and apply experimental results to improve processes,
- an ability to apply creativity in the design of systems, components or processes appropriate to program objectives,
- an ability to function effectively on teams,
- an ability to identify, analyze and solve technical problems,

- an ability to communicate effectively,
- a recognition of the need for, and an ability to engage in, lifelong learning,
- an ability to understand professional, ethical and social responsibilities,
- a respect for diversity and a knowledge of contemporary professional, societal and global issues, and
- a commitment to quality, timeliness and continuous improvement.

In addition our students will be able to (Criterion 9):

- utilize graphic techniques to produce engineering documents;
- conduct standardized field and laboratory testing on civil engineering materials;
- utilize modern surveying methods for land measurement and construction layout;
- determine forces and stresses in elementary structural systems;
- estimate material quantities for technical projects; and
- employ productivity software to solve technical problems.

The CMCE Department prepares its students to achieve or progress toward the following program educational objectives during their first few years after graduation:

- Be employed as engineering technicians, inspectors, assistant project managers or drafter (CAD),
- Pursue advanced degrees in civil engineering or facilities management,
- Prepare for the "Part A: Fundamentals of Engineering" exam and continue to work towards obtaining professional licensure, and
- Progress toward management or technical positions in the civil engineering and construction industries.

REQUIRED COURSES IN THE MAJOR		Credits
CMCE 1104	Statics	3
CMCE 1110	Construction Drawings I	2
CMCE 1155	Computer Applications in Engineering Technology	2
CMCE 1204	Strength of Materials	2
CMCE 1210	Construction Drawings II Computer Aided Drawing (CAD)	1
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 Laboratory	0
CMCE 2410	Construction Drawings III	2
CMCE 2415	Elements of Structural Design – Concrete	2
CMCE 2454	Applied Hydraulics	2
CMCE 2455	Materials and Methods for Construction (Civil Technology)	2
CMCE 2456	Soil Mechanics and Laboratory	3
Subtotal		36
ADDITIONAL REQUIRED COURSES		
ENG 1101	English Composition I	3
MAT 1375 ¹	Precalculus	4
MAT 1475	Calculus I	4
PHYS 1433	Physics 1.2	4
or		
PHYS 1441	Physics 1.3	5
PHYS 1434	Physics 2.2	4
or		
PHYS 1442	Physics 2.3	5
Subtotal		19-21
REMAINING CORE REQUIREMENTS²		
BS/SS	Behavioral Science/Social Science	3
COMM	Communications - ENG 1121 or ENG 1133	3
LAP	Literature/Aesthetics/Philosophy	3
Subtotal		9
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 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 up to eight (8).

² See page 35 for a detailed explanation of core-required courses and categories.

Curriculum by Semester

For students earning an Associate in Applied Science (AAS) degree with a major in civil engineering technology.

FIRST SEMESTER		Credits
CMCE 1104	Statics	3
CMCE 1110	Construction Drawings I	2
CMCE 1155	Computer Applications in Engineering Technology	2
ENG 1101	English Composition I	3
MAT 1375	Precalculus	4
LAP ¹	Literature/Aesthetics/Philosophy	3
Subtotal		17
SECOND SEMESTER		
CMCE 1204	Strength of Materials	2
CMCE 1210	Construction Drawings II – Computer Aided Drawing (CAD)	1
CMCE 1222	Surveying I	3
MAT 1475	Calculus I	4
PHYS 1433	Physics 1.2	4
	or	
PHYS 1441	Physics 1.3	5
Subtotal		14-15
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	Physics 2.2	4
	or	
PHYS 1442	Physics 2.3	5
Subtotal		16-17
FOURTH SEMESTER		
CMCE 2410	Construction Drawings III	2
CMCE 2415	Elements of Structural Design – Concrete	2
CMCE 2454	Applied Hydraulics	2
CMCE 2455	Materials and Methods of Construction (Civil)	2
CMCE 2456	Soil Mechanics and Laboratory	3
BS/SS ¹	Behavioral Science/Social Science	3
COMM ¹	Communications - ENG 1121 or ENG 1133	3
Subtotal		17
TOTAL CREDITS REQUIRED FOR THE DEGREE		64-66

¹ Students without the requisite 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 See page 35 for a detailed explanation of core-required courses and categories.

Associate in Applied Science in CONSTRUCTION MANAGEMENT TECHNOLOGY

The 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 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. Courses in computer-aided drawing 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, surveyor, construction inspector, drafter (CAD).

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 facilities management. See page 254 for a complete description of the BTech in Facilities Management. 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

Alternate Format

An alternate format AAS is offered in construction management technology. Please consult the department for eligibility requirements and further information.

REQUIRED COURSES IN THE MAJOR		Credits
CMCE 1104	Statics	3
CMCE 1110	Construction Drawings I	2
CMCE 1114	Materials and Methods of Construction I	3
CMCE 1155	Computer Applications in Engineering Technology	2
CMCE 1204	Strength of Materials	2
CMCE 1210	Construction Drawings II – Computer Aided Drawing (CAD)	1
CMCE 1220	Construction Management I	2
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 2320	Construction Management II	2
CMCE 2410	Construction Drawings III	2
CMCE 2412	Construction Estimating	2
CMCE 2415	Elements of Structural Design-Concrete	2
CMCE 2420	Construction Management III	2
CMCE 2900	Construction Management Internship (Optional)	0
Subtotal		37
ADDITIONAL REQUIRED COURSES		
ENG 1101	English Composition I	3
MAT 1275 ¹	College Algebra and Trigonometry	4
MAT 1375	Precalculus	4
PHYS 1433	Physics 1.2	4
or		
PHYS 1441	Physics 1.3	5
CMCE Elective		
Choose one of the following for 3 credits		3
ACC 1162	Elements of Accounting	
MKT 1100	Essentials of Marketing	
Subtotal		18-19
REMAINING CORE REQUIREMENTS²		
BS/SS	ECON 1101 (Macroeconomics)	3
COMM	Communications	3
LAP	Literature/Aesthetics/Philosophy	3
Subtotal		9
TOTAL CREDITS REQUIRED FOR THE DEGREE		64-65

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 See page 35 for a detailed explanation of core-required courses and categories.

Curriculum by Semester

The College will grant an Associate in Applied Science (AAS) degree with a major in construction management technology upon satisfactory completion of the required 64 credits listed.

FIRST SEMESTER		Credits
CMCE 1104	Statics	3
CMCE 1110	Construction Drawings I	2
CMCE 1114	Materials and Methods of Construction I	3
CMCE 1155	Computer Applications in Engineering Technology	2
ENG 1101	English Composition I	3
MAT 1275 ¹	College Algebra and Trigonometry	4
Subtotal		17
SECOND SEMESTER		
CMCE 1204	Strength of Materials	3
CMCE 1210	Construction Drawings II – Computer Aided Drawing (CAD)	1
CMCE 1220	Construction Management I	2
CMCE 1222	Surveying I	3
CMCE 1224	Methods and Materials of Construction II	2
MAT 1375	Precalculus	4
COMM	Communications	3
Subtotal		17
THIRD SEMESTER		
CMCE 2306	Materials Testing Laboratory	2
CMCE 2315	Elements of Structural Design-Steel	3
CMCE 2320	Construction Management II	2
CMCE 2319	Building Service Systems	2
PHYS 1433	Physics 1.2	4
or		
PHYS 1441	Physics 1.3	5
CMCE Elective		
Choose one of the following for 3 credits		3
ACC 1162	Elements of Accounting	
MKT 1100	Essentials of Marketing	
Subtotal		16-17
FOURTH SEMESTER		
CMCE 2410	Construction Drawings III	2
CMCE 2412	Construction Estimating	2
CMCE 2415	Elements of Structural Design – Concrete	2
CMCE 2420	Construction Management III	2
CMCE 2900	Construction Management Internship	0
BS/SS ²	ECON 1101 (Macroeconomics)	3
LAP ²	Literature/Aesthetics/Philosophy	3
Subtotal		14
TOTAL CREDITS REQUIRED FOR THE DEGREE		64-65

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 See page 35 for a detailed explanation of core-required courses and categories.

Certificate in CONSTRUCTION MANAGEMENT

The Department of Construction Management and Civil Engineering Technology offers a 15-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, reading and 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	
CMCE 1114	Materials and Methods of Construction I	3
CMCE 1155	Computer Applications in Engineering Technology	2
CMCE 1210	Construction Drawings II – Computer Aided Drawing (CAD)	1
CMCE 1220	Construction Management I	2
CMCE 1224	Materials and Methods of Construction II	2
CMCE 2320	Construction Management II	2
CMCE 2412	Construction Estimating	2
CMCE 2420	Construction Management III	2
TOTAL CREDITS REQUIRED FOR THE CERTIFICATE		18

Certificate in SUSTAINABLE TECHNOLOGY

See page 182

COURSES:

CMCE 1104 Statics I

3 cl 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. Students are required to achieve a minimum grade of C in order to successfully 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)*

CMCE 1110 Construction Drawings I

1 cl hr, 2 lab hrs, 2 cr

Fundamental principles of drafting required in the construction field. Students learn the proper use of drafting instruments and develop a basic working knowledge of construction drawings. Students survey existing conditions and prepare construction drawings from field measurements. Site plans, basic electrical and plumbing drawings will also be studied. *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 1155 Computer Applications in Engineering Technology

0 cl hrs, 4 lab hrs, 2 cr

Students acquire a working knowledge of computers and their application in the fields of Construction and Civil Engineering. Topics include computer systems, terminology, internet use and searches, word processing (Word), spreadsheets (Excel), and presentation software (PowerPoint). Students learn to use these tools to manage construction projects, prepare estimates, proposals, and oral presentations through Project Based Learning. Students work in groups to explore real world challenges and develop cross-curricular skills. The student apply class concepts to respond to a Request for Proposal (RFP). *Prerequisite: CUNY proficiency in reading and writing*

CMCE 1204 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 1104 with a grade of C or higher*

CMCE 1210 Construction Drawings II – Computer Aided Drawing (CAD)

0 cl hr, 2 lab hrs, 1 cr

Students acquire a basic working knowledge of Computer Aided Drafting. Through the use of residential drawings, students build on their basic knowledge of both civil engineering and construction drawing principles and standards. Students learn basic commands and/or steps required to start, create, save and plot CAD drawings. Improved skills are also developed in the reading and interpretation of typical working drawings from construction projects. *Prerequisites: CMCE 1110, CMCE 1155*

CMCE 1220
Construction Management I
 2 cl hrs, 2 cr

Introduction to the basic practice of construction management in the erection and construction of a building project. The course is designed to give the student a thorough understanding of the construction process and the elements that comprise this process. Discussion of the design and construction process including types of contracts, zoning and building codes. Project jobsite safety is addressed as part of a ten (10) hour OSHA certification training course. Students must pass an examination administered by OSHA officials in order to obtain a certification card. *Prerequisites:* CMCE 1110, CMCE 1114, CUNY proficiency in reading and writing

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. Students are required to take the Certified Surveying Technician (CST) Level I exam as part of this course. *Prerequisites:* MAT 1275 with a grade of C or higher, CMCE 1110, CMCE 1155; Pre- or corequisite: CMCE 1210

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
 1 cl hr, 2 lab hrs, 2 cr

This course explores the mechanical properties of steel, timber and concrete through laboratory testing. Standard tension, compression, shear, torsion, ductility and bending tests are performed in accordance with ASTM standards. Principles of field inspection of fresh concrete are covered as well. Students are required to take the "Concrete Field Testing Technician - Grade I" certification exam administered 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 1204 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, ventilating, air conditioning and electrical systems used in residential and commercial-industrial buildings. Modern methods and current equipment are emphasized. *Prerequisite:* CMCE 1224

CMCE 2320
Construction Management II
 2 cl hrs, 2 cr

The second in a three-course CM sequence, this course is designed to give the student a thorough understanding of the construction process and the issues concerning resident engineers, inspectors and project managers. This course addresses the responsibility and authority of the owner, engineer,

and inspector. Design-build contracts (public and private); record keeping; digital imaging; CPM guide specs; measurement and payment, claims and disputes, liquidated damages are covered. Proper conduct of field personnel are stressed. *Prerequisites:* CMCE 1110, CMCE 1220, Pre- or Corequisite: CMCE 1224

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. *Prerequisite:* CMCE 1222

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 1204 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 1204 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 1210, CMCE 1222; Pre- or Corequisite: CMCE 2315 or CMCE 2415

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 2320 or department approval

CMCE 2415
Elements of Structural Design – Concrete
 2 cl hrs, 2 cr

This capstone course develops 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. *Prerequisites:* CMCE 1210, CMCE 2315.

CMCE 2420
Construction Management III

1 cl hr, 2 lab hrs, 2 cr
 The third course in the CM sequence. The student learn current practices in preparing a project schedule, including bar charts and the Critical Path Method (CPM). Industry standard computer scheduling software will be used. The use of value engineering (VE) workshop to reduce construction costs will be studied. Construction safety and tasks required for project closeout are covered. *Pre- or corequisite:* CMCE 2320 or department approval

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.

Prerequisites: CMCE 2351, CMCE 2351L

CMCE 2455**Materials and Methods of Construction****(Civil Engineering Technology)***2 cl hrs, 2 cr*

This course provides students with a working knowledge of construction techniques for buildings and structures involving civil engineering (highways and bridges). The fundamentals of the major categories of any construction project, namely excavation, substructure and superstructure are covered in detail. The N.Y.C. Building and Zoning Codes and A.A.S.H.T.O codes are used as reference. The basic principles of construction management are also covered, including construction ethics. An overview of Sustainable Construction and Green Building Design including the LEED – Green Building Rating System is covered.

Pre-or corequisite: CMCE 1222 or department approval

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

CMCE 2900**Construction Management Internship****(Optional)***3 cr*

see Department Chairperson for approval

Electrical and Telecommunications Engineering Technology

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PROGRAMS:

Electrical Engineering Technology/AAS
Telecommunications Engineering Technology/AAS
Telecommunications Engineering Technology/BTech
Telecommunications Technology/AAS (The Verizon Next Step Program)

FACULTY:

Professors: Ayen, Goykadosh, Kalechman, Mynbaev, Razani
Associate Professors: Jang, Kouar, Wei
Assistant Professors: Hossain, Marantz, Saberi, Ummy, Vladutescu
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.

The electrical engineering technology curriculum is accredited by the Technology Accreditation Commission of the Accreditation Board of Engineering and Technology (TAC/ABET). 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 Technology Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: 410.347.7700.

Program Educational Objectives

1. Secure gainful and meaningful careers as electrical/electronics technicians.
2. Embark on careers of personal and professional growth.
3. Pursue life-long learning to enhance an undergraduate degree through formal education and/or certification for career improvement.

Program Outcomes

1. Demonstrate mastery of the theoretical and practical knowledge of electrical and electronic circuits and systems.
2. Identify, formulate and present solutions to technical problems in a variety of special areas related to electrical engineering technology programs.
3. Assemble electrical/electronic circuits in order to measure and analyze responses and parameters using a variety of test equipment and/or computers and software.
4. Communicate and function effectively in teams.
5. Recognize the need for life-long learning and demonstrate a commitment to quality, timeliness and continuous improvement.
6. Demonstrate an awareness and understanding of professional, ethical, and social responsibility.
7. Demonstrate a respect for diversity and a knowledge of contemporary professional, societal and global issues.

REQUIRED COURSES IN THE MAJOR		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 2120	Advanced Circuit Analysis	3
EET 2140	Communications Electronics	3
EET 2141	Communications Electronic 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
Subtotal		39

ADDITIONAL REQUIRED COURSES

ENG 1101	English Composition I	3
MAT 1375 ¹	Precalculus	4
MAT 1475	Calculus I	4
PHYS 1433	Physics 1.2	4
or		
PHYS 1441	Physics 1.3	5
PHYS 1434	Physics 2.2	4
or		
PHYS 1442	Physics 2.3	5
ENG 1121	English Composition II	3
LAP ²	Literature/Aesthetics/Philosophy	3
BS/SS ²	Behavioral Science/Social Science	3
Subtotal		28-30

TOTAL CREDITS REQUIRED FOR THE DEGREE 67-69

The College will grant an Associate in Applied Science (AAS) degree with a major in electrical engineering technology upon satisfactory completion of the required 67 credits listed.

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 See page 35 for a detailed explanation of core-required courses and categories.

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	Physics 1.2	4
or		
PHYS 1441	Physics 1.3	5
ENG 1101	English Composition I	3
Subtotal		17-18

SECOND SEMESTER		Credits
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	Physics 2.2	4
or		
PHYS 1442	Physics 2.3	5
Subtotal		19-20

THIRD SEMESTER		Credits
EET 2120	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		Credits
EET 2220	Electronic Controls	3
EET 2251	Electric Machines Laboratory	1
EET 2262	Digital Electronics II	3
EET 2271	Circuit Analysis Laboratory	1
BS/SS ²	Behavioral Science/Social Science	3
LAP ²	Literature/Aesthetics/Philosophy	3
Subtotal		14

TOTAL CREDITS REQUIRED FOR THE DEGREE 67-69

EET 2000	Internship ³ (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 See page 35 for a detailed explanation of core-required courses and categories.

³ Internship is an elective course that can be taken as early as the second semester and will allow students to gain some industrial experience.

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. See page 231 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.

Verizon Next Step Program

The College is part of a consortium of colleges in the Northeast participating in the Verizon Next Step program in which selected Verizon employees enroll in a customized telecommunications associate degree program sponsored and funded by the company and the Communications Workers of America. Enrollment is limited to Verizon employees who have been selected for the program. The aim of the program is to create a workforce with advanced technical skills coupled with teamwork and team-building skills, an aptitude for critical thinking and problem-solving and for forming good interpersonal relations.

Program Educational Objectives

1. Secure gainful and meaningful careers as telecommunications technicians.
2. Embark on careers of personal and professional growth.
3. Pursue life-long learning to enhance an undergraduate degree through formal education and/or certification for career improvement.

Program Outcomes

1. Demonstrate mastery of the theoretical and practical knowledge of electrical and telecommunications circuits and systems.

2. Identify, formulate and present solutions to technical problems in a variety of specialty areas related to telecommunications engineering technology programs.
3. Assemble telecommunications circuits in order to measure and analyze responses and parameters using a variety of test equipment and/or computers and software.
4. Communicate and function effectively in teams.
5. Recognize the need for life-long learning and demonstrate a commitment to quality, timeliness and continuous improvement.
6. Demonstrate an awareness and understanding of professional, ethical and social responsibilities.
7. Demonstrate a respect for diversity and a knowledge of contemporary professional, societal and global issues.

REQUIRED COURSES IN THE MAJOR		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	Intro 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
Subtotal		39
ADDITIONAL REQUIRED COURSES		
ENG 1101	English Composition I	3
MAT 1375 ¹	Precalculus	4
MAT 1475	Calculus I	4
PHYS 1433	Physics 1.2	4
or		
PHYS 1441	Physics 1.3	5
PHYS 1434	Physics 2.2	4
or		
PHYS 1442	Physics 2.3	5
ENG 1121	English Composition II	3
LAP ²	Literature/Aesthetics/Philosophy	3
BS/SS ²	Behavioral Science/Social Science	3
Subtotal		28-30
TOTAL CREDITS REQUIRED FOR THE DEGREE		67-69

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 See page 35 for a detailed explanation of core-required courses and categories.

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
TCET 1100	Introduction to Telecommunications	2
MAT 1375 ¹	Precalculus	4
ENG 1101	English Composition I	3
Subtotal		15
SECOND SEMESTER		
EET 1222	Circuit Analysis II	5
EET 1240	Electronics	4
EET 1241	Electronics Laboratory	1
PHYS 1433	Physics 1.2	4
or		
PHYS 1441	Physics 1.3	5
ENG 1121	English Composition II	3
Subtotal		17-18
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
PHYS 1434	Physics 2.2	4
or		
PHYS 1442	Physics 2.3	5
MAT 1475	Calculus I	4
Subtotal		19-20
FOURTH SEMESTER		
TCET 2202	Data Communications and Systems	4
TCET 2220	Transmission Systems	3
TCET 2242	Microcomputer Interfacing	3
BS/SS ²	Behavioral Science/Social Science	3
LAP ²	Literature/Aesthetics/Philosophy	3
Subtotal		16
TOTAL CREDITS REQUIRED FOR THE DEGREE		67-69
TCET 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 See page 35 for a detailed explanation of core-required courses and categories.

³ Internship is an elective course that can be taken as early as the second semester and will allow students to gain some industrial experience.

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.

Program Educational Objectives:

1. 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 an undergraduate degree through formal education and/or certification for career improvement.

Program Outcomes:

1. Demonstrate mastery of the theoretical and practical knowledge of telecommunications systems associated with LANs, MANs and WANs.
2. Design, implement and manage telecommunications systems using voice and data.
3. Present a solution or alternate solutions to a variety of technical problems in different areas related to a telecommunications environment.

4. Use advanced mathematical tools in the analysis and design of telecommunications systems.
5. Assemble telecommunications circuits in order to measure and analyze responses and parameters using a variety of test equipment and/or computers and software.
6. Communicate and function effectively in teams.
7. Recognize the need for life-long learning and demonstrate a commitment to quality, timeliness and continuous improvement.
8. Demonstrate an awareness and understanding of professional, ethical and social responsibilities.
9. Demonstrate a respect for diversity and a knowledge of contemporary professional, societal and global issues.

REQUIRED COURSES IN THE MAJOR		Credits
AAS Degree		67
TCET 3102	Analog and Digital Communications I	4
TCET 3120	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 4120	Legal and Regulatory Issues in Telecommunications	2
TCET 4140	Telecommunications Network Management	3
TCET 4202	Advanced Telecommunications	3
TCET 4220	Telecommunications Seminar	2
Subtotal		30
ADDITIONAL REQUIRED COURSES		
ACC 1162	Elements of Accounting	3
CST 2403	Intro C++ Programming Language I	3
ENG 3771	Advanced Career Writing	3
ENG 3773	Advanced Technical Writing	3
ECON 1101	Macroeconomics	3
MAT 1372	Statistics with Probability	3
MAT 1575 ¹	Calculus II	4
PHIL 2106	Philosophy of Technology	3
PHIL 3212	Engineering Ethics	3
REMAINING CORE DISTRIBUTION		
LAP ²	Literature/Aesthetics/Philosophy	3
BS/SS ²	Behavioral Science/Social Science	3
Subtotal		34
TOTAL CREDITS REQUIRED FOR THE DEGREE		131

The College will grant a Bachelor of Technology (BTech) degree with a major in telecommunications engineering technology upon satisfactory completion of the AAS in telecommunications engineering technology or the equivalent and the required 64 credits listed.

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.

² See page 35 for a detailed explanation of core-required courses and categories.

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 3120	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	See Choices on page 234	4
Subtotal		36
ADDITIONAL REQUIRED COURSES		
CST	Elective	3
ENG 3771	Advanced Career Writing	3
ENG 3773	Advanced Technical Writing	3
CET 4942	Economics of Engineering and Management	3
MAT 2572	Probability and Mathematical Statistics I	3
MAT 1575 ¹	Calculus II	4
PHIL 3212	Engineering Ethics	3
Subtotal		22
REMAINING CORE DISTRIBUTION		
LAP ²	Literature/Aesthetics/Philosophy	3
BS/SS ²	Behavioral Science/Social Science	3
TOTAL CREDITS REQUIRED FOR THE DEGREE		64

REQUIRED COURSES IN THE OPTICAL COMMUNICATIONS TRACK		Credits
TCET 3102	Analog and Digital Communications I	4
TCET 3120	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	See Choices on page 234	4
Subtotal		36
ADDITIONAL REQUIRED COURSES		
CST	Elective	3
ENG 3771	Advanced Career Writing	3
ENG 3773	Advanced Technical Writing	3
CET 4942	Economics of Engineering and Management	3
MAT 2572	Probability and Mathematical Statistics I	3
MAT 1575 ¹	Calculus II	4
PHIL 3212	Engineering Ethics	3
Subtotal		22
REMAINING CORE DISTRIBUTION		
LAP ²	Literature/Aesthetics/Philosophy	3
BS/SS ²	Behavioral Science/Social Science	3
TOTAL CREDITS REQUIRED FOR THE DEGREE		64
REQUIRED COURSES IN THE NETWORK MANAGEMENT TRACK Credits		
TCET 3102	Analog and Digital Communications I	4
TCET 3120	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 T	telecommunications Protocols and Network Performance	3
CST 3610	Network Security Fundamentals	3
TCET 4220	Telecommunications Seminar	2
CST	Elective	3
Technical Elective	See Choices on page 234	4
Subtotal		36

ADDITIONAL REQUIRED COURSES		
CST	Elective	3
ENG 3773	Advanced Technical Writing	3
ENG 3771	Advanced Career Writing	3
CET 4942	Economics of Engineering and Management	3
MAT 1572	Probability and Mathematical Statistics I	3
MAT 1575 ¹	Calculus II	4
PHIL 3212	Engineering Ethics	3
Subtotal		22
REMAINING CORE DISTRIBUTION		
LAP ²	Literature/Aesthetics/Philosophy	3
BS/SS ²	Behavioral Science/Social Science	3
TOTAL CREDITS REQUIRED FOR THE DEGREE		64
<p><i>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.</i></p> <p><i>2 See page 35 for a detailed explanation of core-required courses and categories.</i></p> <p><i>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.</i></p>		

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 4220	Telecommunications Seminar
TCET 4000	Internship

CST ELECT

CST 2403	Intro C++ Programming Language I
CST 2406	Introduction to Systems Analysis and Design
CST 3503	C++ Programming II
CST 3504	Design of Microcomputer Database
CST 2309	Web Programming I
CST 3510	Computer Security
CST 3603	Object-Oriented Programming
CST 3604	Design of Distributed Database
CST 2409	Web Programming II
CST 3610	Network Security
CST 4703	UNIX Networking and the Internet
CST 4704	Data Warehousing
CST 4706	Design of Object-Oriented Distributed Systems
CST 4710	Advanced Network Security
CST 4801	Topics in Information Technology

MAT ELECT

MAT 3787	Applied Mathematics: Finite Fields
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OTHER ELECTIVE COURSES

ELECT	Electives with Department Approval
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Curriculum by Semester

For students earning a Bachelor of Technology (BTech) degree with a major in telecommunications engineering technology.

FIRST SEMESTER

		Credits
TCET 3102	Analog and Digital Communications I	4
TCET 3120	Switching and Automata Theory	3
TCET 3142	Computer Systems	3
MAT 1575 ¹	Calculus II	4
ENG 1121	English Composition II or	
ENG 3773	Advanced Technical Writing	3
	Subtotal	17

SECOND SEMESTER

TCET 3202	Analog and Digital Communications II	4
TCET 3222 ²	Satellite Transmission	3
ECON 1101	Macroeconomics	3
MAT 1372	Probability and Statistics	3
ENG 2700	Advanced Career Writing	3
	Subtotal	16

THIRD 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 I	3
PHIL 2106	Philosophy of Technology	3
	Subtotal	14

FOURTH SEMESTER

TCET 4202	Advanced Telecommunications	3
TCET 4220	Telecommunications Seminar	2
ACC 1162	Elements of Accounting	3
LAP ³	Literature/Aesthetics/Philosophy	3
BS/SS ³	Behavioral Science/Social Science	3
PHIL 3212	Engineering Ethics	3
	Subtotal	17

TOTAL CREDITS REQUIRED FOR THE DEGREE

	64	
TCET 4000	Internship ⁴ (optional)	3

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.

² Student must take TCET 2220 if not taken in AAS.

³ See page 35 for a detailed explanation of core-required courses and categories.

⁴ Internship is an elective course that can be taken as early as the second semester to allow students to gain industrial experience and add three (3) credits to their degree.

The Verizon Next Step Program Associate in Applied Science in TELECOMMUNICATIONS TECHNOLOGY

The Next Step Telecommunications Technology program and its courses have been designed to meet the combined requirements of the Verizon Corporation and the Communication Workers of America (CWA) and are open to those individuals only. This 60 credit degree offering is scheduled and sequenced to be completed over a four-year period. The student-employees are released from work to attend classes one day per week and are provided with notebook computers equipped with the necessary software for their courses, as an integral part of the program.

As a corporate and union specific program, only Verizon employees represented by CWA are eligible to attend this program. New York City College of Technology along with 16 New York and 10 New England colleges, collaborate to keep this competency- based associate's degree program geared to today's rapidly changing marketplace and advancing technologies in the telecommunications field.

Curriculum by Semester

For students earning an Associate in Applied Science (AAS) degree with a major in Telecommunications Technology - Verizon.

FIRST SEMESTER		Credits
MAT 1215	Technical Mathematics with Applications I	4
MST 1101	Introduction to Microcomputers	3
SECOND SEMESTER		
ETX 1212	Digital Systems for Telecommunications 1	4
ENG 1101	English Composition I	3
THIRD SEMESTER		
ETX 2112	Digital Systems for Telecommunications 2	4
MAT 1315	Technical Mathematics with Applications II	4
FOURTH SEMESTER		
ETX 2222	Electrical Circuits	4
PHYS 1420	Principles of Physics	4
FIFTH SEMESTER		
ETX 3122	Electronic System I	4
ETX 3142	Telecommunications 1	4
SIXTH SEMESTER		
ETX 3222	Electronic System II	4
ETX 3242	Telecommunications 2	4

SEVENTH SEMESTER		Credits
ETX 4142	Telecommunications 3	4
ENG 1121	English Composition II	3
EIGHTH SEMESTER		
ETX 4242	Telecommunications 4	4
STS 3401	Science, Technology and Society	3
TOTAL CREDITS REQUIRED FOR THE DEGREE		60

REQUIREMENTS FOR THE AAS DEGREE

GENERAL EDUCATION CORE REQUIREMENTS		Credits
ENG 1101		
ENG 1121	English I and II	6
MST 1101	Computer Applications	3
MAT 1215		
MAT 1315	Technical Mathematics I and II	8
PHYS 1420	Physics	4
STS 3401	Labor Management	3
Subtotal		24

REQUIREMENTS FOR THE MAJOR ELECTRICAL/ELECTRONICS CORE

ETX 1212		
ETX 2112	Digital Systems for Telecommunications I and II	8
ETX 2222	Electrical Circuits	4
ETX 3122		
ETX 3222	Electronics I and II	8
Subtotal		20

TELECOMMUNICATIONS CORE		Credits
ETX 3142	Telecommunications I	4
ETX 3242	Telecommunications II	4
ETX 4142	Telecommunications III	4
ETX 4242	Telecommunications IV	4
Subtotal		16
Total Required Credits for the Degree		60

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***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, PHYS 1433 or equivalent***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, ENG 1101, PHYS 1434***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 2120
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***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 Electronic
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***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 2120, MAT 1475***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 2261
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 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 and PHYS 1434 or PHYS 1442***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 equivalent

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

ETN 2400/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.

Pre- or corequisite: CST 2307

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

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 2261

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

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: EET 2140, EET 2141, MAT 1475

TCET 3120 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: TCET 2242 or EET 2261

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 degree in ET, TC, CS, EM or equivalent

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 3120

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 hardware 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, 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 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 4220 Telecommunications Seminar

2 cl hrs, 2 cr

A senior-level course covering current topics and concerns in the telecommunications field. Students conduct research of the current literature on topics and information that are timely and important to the technology. In addition, guest speakers and video presentations of current issues address the most recent developments in the industry. Students make oral presentations of their research in class. Typical topics: photonic switches and their architecture, video, television, high-resolution video, compressed video, ATM and ATM switches, backbones (FDDI, DBDQ, SONET), mobile/wireless communications, B-ISDN, TCP/IP are discussed.

Prerequisites: TCET 4102, TCET 4140

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

VERIZON NEXT STEP/ CMA COURSES ELECTIVES

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 Electronic Systems I

4 cl hrs, 4 cr

Analysis and application of advanced electronic circuits as applied to the telecommunications industry is focus of this course. Topics include frequency response of filters, op-amps, oscillators, amplitude modulation, noise and LC circuits. Troubleshooting and analysis by computer simulation software is stressed.

Prerequisite: ETX 2222

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 fiberoptics. Troubleshooting and analysis by computer simulation software is stressed throughout.

Prerequisite: ETX 3122

ETX 3142 Telecommunications I

4 cl hrs, 4 cr

This course will cover the basics of Voice over Internet Protocol (VoIP) systems. Topics include: an overview of TCP/IP networks with a focus on VoIP; an introduction to VoIP; Quality of Service (QoS); VoIP system components; VoIP protocols and VoIP protocol analysis, VoIP architecture and VoIP codecs. A hands-on approach will be taken, with team projects throughout.

Corequisite: ETX 3122

ETX 3242 Telecommunications II

4 cl hrs, 4 cr

This course covers the organization, architecture, setup, hardware and software aspects networked video delivery systems Topics include: Video transport; compression; packet transport; multicasting; Content Ownership and Security; Transport security; IPTV-IP Video to the Home; Video File Transfer; VPN's and Home-Office video links. A hands-on approach will be taken, with team projects throughout.

Prerequisite: ETX 3142, Corequisite: ETX 3222

ETX 4142 Telecommunications III

3 cl hrs, 2 lab hrs, 4 cr

A survey of current and emerging technologies in Telecommunications will be presented. Lectures, interactive learning, demonstrations, on issues of; Narrowcasting, Multicasting System Architecture, VBI Compression covered. Hands-on approach will be taken, with team projects throughout the course.

Prerequisite: ETX 3242

ETX 4242 Telecommunications IV

3 cl hrs, 2 lab hrs, 4 cr

Home integration, Needs of a residential network Standards and regulations, Home security and ISP security, Remote security access, VPN and Video conferencing. Assignment of group to select, configure and implement internet connectivity with interactive learning and hands-on work will be employed.

Prerequisite: ETX 4142

Entertainment Technology

David B. Smith, Chair
 Voorhees Hall, room V 205
 718.260.5588
 email: dsmith@citytech.cuny.edu

PROGRAMS:

Emerging Media Technologies/BTech (MTEC)
 Entertainment Technology/BTech (STB)
 Interactive Media Technologies (IMC)
 Lighting Systems Technology/Cert (LSC)
 Scenery Construction/Cert (SCC)
 Show Control/Cert (SHC)
 Sound Systems Technology/Cert (SSC)
 Video Production/Cert (VPC)

FACULTY:

Professors: Huntington, Scott, Smith, Wortzel
 Assistant Professors: Baker, Brandt,, McCullough, Terao

Senior CLT: Robinson
 CLT: Eberle

Bachelor of Technology in ENTERTAINMENT TECHNOLOGY

The entertainment industry has grown tremendously in the last 20 years. The increasing prominence of the theme park, the arena concert, the marriage of mall development and amusement, the use of immersive technologies in advertising and marketing, 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 control 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; architectural lighting; 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 work at the graduate level.

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.

Recent high school graduates and people with some background in the industry are equally suited to enter the program. Designed as a four-year baccalaureate degree, the program admits entry-level students in the freshman year who meet the general College criteria for baccalaureate admissions on pages 8, 34. In general, this means that the student must meet CUNY proficiency requirements in reading, writing and mathematics.

Approximate additional costs other than tuition, student fees and material fees will range from \$700 to \$1,400 for textbooks and tools over the four years of the program.

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, costume, video, show control, production, publicity and scenery crews for performances each year. For further information, call 718.260.5588 at the Entertainment Technology office in Voorhees Hall.

REQUIRED COURSES IN THE MAJOR

		Credits
ENT 1101	Introduction to Entertainment Technology	2
ENT 1102	Health and Safety in Production	1
ENT 1103	Basic Electricity for Live Entertainment	1
ENT 1110	Scenery Construction	3
ENT 1203	Basic Electricity for Live Entertainment Lab	1
ENT 1250	Lighting Technology	3
ENT 1270	Sound Technology	3
ENT 2120	Technical Production I	1
ENT 2200	Theatrical Drafting	3
ENT 2220	Technical Production II	2
ENT 2280	Entertainment Control Systems	3
ENT 3320	Technical Production III	2
ENT 3420	Technical Production IV	2
ENT 4421	Technical Production V	2
ENT 4430	Project Management	3
ENT 4499	Culmination Project	2
ENT 4900	Internship in Entertainment Technology	3

Subtotal **37**

ADDITIONAL REQUIRED COURSES

IND 1112	Engineer Drawing I	2
CST 1101	Problem Solving with Computer Programming	3
THE 1280	History of the Physical Theater	3

Subtotal **8**

DESIGN CORE

Select two of the following courses for 6 credits:

ENT 4410	Technical Direction	3
ENT 4450	Lighting Design	3
ENT 4470	Sound Design	3
ENT 4480	Show Control	3

Subtotal **6**

BACCALAUREATE CORE DISTRIBUTION		42-43 credits
ENG 1101	English Composition I	3
ENG 1121 or higher ¹	Communications Elective	3
	or	
LIB 1201	Research and Documentation	
ENG 2002	Introduction to Literature II Drama and any AES Core Course	6 1
	or	
THE 2380 ENG 2000 or higher ¹	Play Analysis and Aesthetics and English Lit Course	
MATH I and II	Mathematics	min. 7
SCI I and II	Laboratory Science	8
PHIL I	Philosophy Elective	3
BS/SS	Behavioral Science/Social Science	9
THE 1280	History of the Physical Theater	3
SPE 1320 or higher ¹	Communications Elective	3
	Subtotal	min. 42
ELECTIVE COURSES²		
Select 26-27 credits including at least eight elective courses from the Entertainment Technology Department:		
ENT 1190/ ADV 2320	Intro to Film and Video Production Design	3
ENT 1260	Music Technology	3
ENT 2140	Basic Welding	2
ENT 2180	Ins and Outs of Physical Computing	3
ENT 2210	Advanced Scenery Construction	3
ENT 2260	Music Synthesis and Sampling	3
ENT 2290	Video Studio Operations	3
ENT 2350	Lighting Controls for Stage and Studio	3
ENT 2370	Sound Engineering	3
ENT 3140	Topics and Perspectives in Emerging Technologies	3
ENT 3200	Introduction to Scenic Design	3
ENT 3240	Interdisciplinary Team Project	3
ENT 3290	Digital Video Camera	3
ENT 3300	Theatrical CAD	2
ENT 3310	Monster Shop	2
ENT 3330	Entertainment Video Systems	2
ENT 3360	Scene Painting	2
ENT 3390	Sound for Multimedia	3
ENT 3410	Stage Rigging and Mechanics	2
ENT 4422	Technical Production VI	1
ENT 4901	Entertainment Technology Internship II	3
ENT A	Third Course from the Design Core List	3
IMT 1000	Technology Skills Lab	1
IMT 1101	Introduction to Interactive Media Technologies Design Process	3
IMT 1102	Introduction to Interactive Media Technologies Production Process	3
MTEC 1001, 1002, 2001, 2002, 3001, 3002	Media Technology Skills Labs 1 - VI	1
MTEC 1201	Media Design Foundation	3
MTEC 1203	Tangible Media Foundation	3
MTEC 2101	Interaction Design I	3
MTEC 2102	Ecological Design I	3
MTEC 2103	Performance Design I	3
MTEC 2105	Narrative Design I	3
MTEC 3800, 3801, 4800	Interdisciplinary Team Project I - III	3
For the remaining credits, select from the following:		
ADVERTISING DESIGN COURSES		
ADV 1162	Raster & Vector Graphics	3
ADV 2320	Intro to Film and Video Production Design	3
ADV 3521	Motion Graphics I	3
ADV 3523	Storyboard Concepts	3
ADV 3540	Two-Dimensional Animation	3
ADV 3620	Broadcast Design I	3
ADV 3621	Motion Graphics II	3
ADV 3627	Time-Based Typography	3
ADV 3630	Broadcast Design II	3
ADV 3640	Three Dimensional Animation and Modeling	3
ADV 4764	Design for Mobile Devices	3
ADV 4860	Streaming Media for the Web	3
GRA 2330	Digital Photography I	2
AFRICAN AMERICAN STUDIES		
AFR 1321	Black Theatre	3
ARCHITECTURE		
ARCH 1290	Architectural CAD	2
BUSINESS		
BUS 1122	Business Law	3
BUS 2340	Financial Management	4
MKT 1000	Essentials of Marketing	3
MKT 1102	Principles of Selling	3
MKT 2327	Entrepreneurship	3
COMPUTER ENGINEERING TECHNOLOGY		
EMT 1150	Electrical Circuits	5
EMT 1250	Digital Control	4
EMT 1255	Electronics	4
COMPUTER SYSTEMS TECHNOLOGY		
CST 1201	Programming Fundamentals (Java)	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
CST 3513	Object Oriented Programming in Java	3

ENGLISH

ENG 1773	Weird Science: Interpreting and Redefining Humanity	3
ENG 2400	Films from Literature	3

HUMANITIES ART

ARTH 1101	History of Art: Prehistoric to Gothic	3
ARTH 1102	History of Art: Renaissance to Modern	3
ARTH 1103	Survey of Art History	3
ARTH 1104	Art of the United States	3
ARTH 1106	Modern Art	3
ARTH 1108	Art of Asia	3
ARTH 1110	Islamic Art	3
ARTH 3311	The History of Graphic Design	3
ARTH 3401	Italian Renaissance Art and Architecture	3

HUMANITIES MUSIC

MUS 1201	Musical Concepts	3
MUS 1202	Fundamentals of Musicianship	3
MUS 1210	Musical Styles	3
MUS 1211	Music of Latin America	3
MUS 2206	Jazz	3
MUS 2207	Twentieth Century Music	3

HUMANITIES PERFORMANCE

PERF 1130	Music Workshop Piano I	2
PERF 1132	Music Workshop Guitar	2

HUMANITIES THEATRE

THE 2180	History of Physical Theatre	3
THE 2380	Play Analysis	3

INDUSTRIAL DESIGN

IND 2313	Industrial Design I	2
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 2335	Kinematics and Dynamics of Machines	3

LIBRARY

LIB 1201	Research and Documentation in the Digital Age	3
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MATHEMATICS

MAT 2440	Discrete Structures and Algorithms	3
MAT 1475	or next Math course in the required sequence	4

Subtotal **min. 27**

TOTAL CREDITS REQUIRED FOR THE DEGREE **120**

1 See page 35 for a detailed explanation of core-required courses and categories.

2 An individual plan of study will be developed with the departmental advisor to tailor courses for each individual student from a wide variety of course listings. A sample listing of elective courses is available in the department office. Electives plus baccalaureate core must equal a minimum of 74 credits.

Bachelor of Technology in EMERGING MEDIA TECHNOLOGIES

The BTech in Emerging Media Technologies is a highly interdisciplinary four-year degree that integrates media design, computing and engineering. The first year provides comprehensive overviews and hands-on experiences in digital, tangible and interactive media. In the second year students elect one of three Concentrations: Media Design, Media Computing or Entertainment Engineering. Concentrations include coursework offered in participating departments, including Computer Engineering, Computer Systems, Mechanical Engineering and Industrial Design, Electrical Engineering and Telecommunications, and Architectural Technology. In the third and fourth years students collaborate through Interdisciplinary Team Projects, while they continue courses in their concentration area.

The program is one of a kind in its approach integrating media design theory and practice, computational 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 knowledge 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.

The program requires a portfolio review to continue after the first two semesters. Portfolio examples must be in at least one of the following areas: media, design, software programming, hardware engineering.

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/academics/deptsites/entttech/index.html>

LIBERAL ARTS CORE*

(all of the following are part of the Liberal Arts Core)

Course Number		Credits
ENG 1101	English Composition I	3
LIB 1201	Research and Documentation in the Information Age	3
PSY 1101	Introduction to Psychology*	3
PSY 3407	Psychology of Visual Perception*	3
PHIL 2106	Philosophy of Technology*	3
ENG 2002	Introduction to Literature II Drama*	3
THE 1280	History of Theater*	3
SPE 1330	Effective Speaking	3
HIS 3209	History of Technology*	3
Subtotal		27

* These courses are recommended, but may be replaced by other courses in Behavioral and Social Sciences and Literature/Aesthetics/Philosophy that the College deems eligible Core courses.

SCIENCE AND MATH REQUIRED FOR ENTERTAINMENT ENGINEERING

PHYS 1441	Physics 1.3	5
PHYS 1442	Physics 2.3	5
MAT 1475	Calculus I	4
MAT 1575	Calculus II	4

SCIENCE AND MATH REQUIRED FOR MEDIA COMPUTING

PHYS 1433	Physics 1.2	4
	or	
PHYS 1441	Physics 1.3	5
PHYS 1434	Physics 2.2	4
	or	
PHYS 1442	Physics 2.3	5
MAT 1375	Pre-Calculus	4
MAT 2440	Discrete Structures and Algorithms I	3

SCIENCE AND MATH REQUIRED FOR MEDIA DESIGN

PHYS 1111	Principles of Science I with Lab	4
PHYS 1112	Principles of Science II with Lab	4
MAT 1180	Math Concepts and Applications	4
MAT 1280	Quantitative Math	4
Subtotal		16-18

MAJOR COURSES**CREATIVE MEDIA FOUNDATIONS**

Course Number		Credits
IMT 1101	Introduction to Interactive Media Technologies Design Process	3
IMT 1102	Introduction to Interactive Media Technologies Production Practices	3
IMT 1100/ MTEC 1001	Media Technology Skills Labs I	1
IND 1112	Engineering Drawing	2
MTEC 1201	Media Design Foundation	3
CST 1101	Problem Solving with Computer Programming	3
MTEC 1203	Tangible Media Foundation	3
MTEC 1002	Media Technology Skills Labs II	1
Subtotal		19

ADVANCED COURSES

ENT 3140	Topics and Perspectives in Emerging Technologies	3
ENT 4498	Portfolio Presentation	1
ENT 4430	Project Management	3
ENT 4900	Internship (135 Field Hours)	3
ENT 3240/ MTEC 3800	Interdisciplinary Team Project I	3
MTEC 4800	Interdisciplinary Team Project II	3
MTEC 4801	Interdisciplinary Team Project III	3
Subtotal		19

CONCENTRATIONS/CAREER TRACKS (choose 1)**MEDIA DESIGN CONCENTRATION REQUIRED COURSES**

ADV 2320	Introduction to Film and Video	3
ENT 1280	Ins and Outs of Physical Computing	3
ENT 3390	Sound for Multimedia	3
MTEC 2120	Interaction Design I	3
Subtotal (Concentration Required Courses)		12

Media Design Career Tracks (Choose 1)**(A) Performance Design**

MTECH 2160	Performance Design I	3
ENT 1101	Introduction to Entertainment Technology	2
ENT 1250	Lighting Technology	3

(B) Interaction Design

MTEC 2125	Narrative Design	3
ADV 4720	Multimedia Design I	3

(C) EcoDesign

MTEC 2175	Ecological Design I	3
ARCH 3550	Building Performance Workshop	3
IND 2313	Industrial Design I	2

(D) Cinematics

MTEC 2125	Narrative Design	3
ADV 3620	Digital Video Design I	3
ADV 3540	Two Dimensional Animation	3

Subtotal (Career Track) 6/9

Concentration Electives

Choose 18 to 21 Credits from recommended Career Track Electives

Concentration Subtotal 39

ENTERTAINMENT FABTRONICS CONCENTRATION REQUIRED COURSES

Course Number	Credits	
CST 1201	Programming Fundamentals	3
ENT 1280	Ins and Outs of Physical Computing	3
MTEC 2120	Interaction Design I	3
Subtotal (Concentration Required Courses)		9

Entertainment Fabtronics Career Tracks (Choose 1)**(A) Tangibles, Mobiles and Fabrication**

IND 2304	Advanced Solids Modeling	2
MECH 1233	Statics and Strength of Materials	3
EMT 1150	Electrical Circuits	5
and		
EMT 1250	Digital Control	4
or		
ETN 1102	Principles of Electricity and Electronics	4
and		
ETN 1302	Principles of Electricity, Electronics and Computer Operation	4
CET 3640	Software for Computer Control	3

(B) Performance Fabtronics

ENT 4480	Show Control	3
EMT 1250	Digital Control	4
or		
ETN 1302	Principles of Electricity, Electronics and Computer Operation	4
CET 3510	Microcomputer Systems	4
CET 4952	Robotics Technology	4
MAT 2580	Introduction to Linear Algebra	3
CST 2403	Introductory C++ Programming Language Part I	3
Subtotal (Career Track)		16/21

Concentration Electives

Choose 9-14 Credits from recommended Career Track Electives

Concentration Subtotal 39

MEDIA COMPUTING CONCENTRATION REQUIRED COURSES

Course Number	Credits	
CST 1201	Programming Fundamentals	3
MTEC 212	Interaction Design I	3
MTEC 3230	Introduction to Interactive 3D Environments Programming	3
MECH 1222	Computer-Aided Engineering Graphics	2
Subtotal (Concentration Required Courses)		11

Media Computing Career Tracks (Choose 1)**(A) Media Cyberinfrastructure**

CST 1204	Database Systems Fundamentals	3
CST 2309	Web Programming I	3
CST 2301	Multimedia and Mobile Device Programming	3
CST 1215	Operating Systems Fundamentals	3
CST 2403	Introductory C++ Programming Language Part I	3

(B) Simulation and Game Technologies

IND 2304	Advanced Solids Modeling	2
IND 2313	Industrial Design I	2
IND 2410	Industrial Design II	3
IND 2420	Engineering Animation and Presentation	2
MECH 3550	Simulation and Visualization	3
MECH 4800	Advanced 3D Animation	3
MECH 1240	Computer Applications in Mechanical Engineering Technology	2
ADV 3540	Two Dimensional Animation	3
Subtotal (Career Track)		15/20

Concentration Electives

Choose 8-13 Credits from recommended Career Track Electives

ELECTIVE COURSES

Each Concentration and Career Track requires from 9 to 21 Elective Credits, as specified in the program requirements.

Select Electives from the following list, or select any MTEC course that is not required in your Career Track.

Electives:

ADV 3640	3-D Animation and Modeling I	3
ADV 4740	3-D Animation and Modeling II	3
CET 3510	Microcomputer Systems	4
CET 3640	Software for Computer Control	3
CET 4960	Applied Digital Technology	4
CST 1215	Operating Systems Fundamentals	3
CST 2301	Multimedia and Mobile Device Programming	3
CST 2407	Networking Fundamentals	3
CST 2409	Web Programming II	3
CST 2415	System Administration (UNIX/Linux)	3
CST 3503	C++ Programming II	3
ENT 1260	Music Technology	3
IND 2401	Furniture Design	2
MECH 2322	Engineering Materials	3

TOTAL CREDITS IN THE MAJOR 77

TOTAL CREDITS IN THE CORE 43

TOTAL CREDITS FOR THE DEGREE 120

CAREER LADDER CERTIFICATE PROGRAMS**Entertainment Technology Certificate Programs**

City Tech's Entertainment Technology program offers six certificates - in sound systems technology, lighting systems technology, scenery construction and show control. These certificates are designed for working professionals who want to update their skills and recent BFA/BA graduates who want to expand their technical skills or gain experience with state-of-the-art equipment. Primary and secondary education teachers needing professional development courses can also benefit. Each certificate represents about three semesters of study, although it may take more or less time to complete, depending on course scheduling and the student's work schedule. The basics of each discipline are covered in the first courses; the studies then progress to advanced coursework in a highly sophisticated lab with individual student use of all equipment and software for each area. Each certificate has its own laboratory with state-of-the-art facilities.

Requirements for admission to Career Ladder Certificate Program

CUNY proficiency in reading, writing and mathematics

Requirements for Matriculates

The following may be required, based upon placement examinations in reading, writing and mathematics:

ENG 092W Developmental Writing (if required)

ENG 092R Developmental Reading (if required)

MAT 0605 Developmental Math (if required)

Certificate in SOUND SYSTEMS TECHNOLOGY

Sound Systems Technology covers basic and advanced sound reinforcement, playback systems, rigging and performance audio.

REQUIRED COURSES IN THE MAJOR		Credits
ENT 1103	Basic Electricity for Live Entertainment	1
ENT 1270	Sound Technology	3
ENT 2370	Sound Engineering	3
ENT 3390	Sound for Multimedia	3
ENT 3410	Stage Rigging and Mechanics	2
ENT 4470	Sound Design	3
TOTAL CREDITS REQUIRED FOR CERTIFICATE		15

Certificate in LIGHTING SYSTEMS TECHNOLOGY

Lighting Systems Technology covers lighting practices rigging including moving lights, console programming and technical lighting system design and planning.

REQUIRED COURSES IN THE MAJOR		Credits
ENT 1103	Basic Electricity for Live Entertainment	1
ENT 1250	Lighting Technology	3
ENT 2200	Theatrical Drafting	3
ENT 2350	Lighting Controls for Stage and Studio	3
ENT 3350	Lighting Production Techniques	3
ENT 3410	Stage Rigging and Mechanics	2
TOTAL CREDITS REQUIRED FOR CERTIFICATE		15

Certificate in SCENERY CONSTRUCTION

Scenery Construction covers scenery construction techniques from beginning to advanced, with basic drafting and welding techniques.

REQUIRED COURSES IN THE MAJOR		Credits
ENT 1102	Health and Safety in Production	1
ENT 1110	Scenery Construction	3
ENT 2120	Technical Production I	1
ENT 2140	Basic Welding	2
ENT 2200	Theatrical Drafting	3
ENT 2210	Advanced Scenery Construction	3
ENT 3300	Theatrical CAD	2
ENT 3410	Stage Rigging and Mechanics	2
TOTAL CREDITS REQUIRED FOR CERTIFICATE		17

Certificate in SHOW CONTROL

Show Control, an advanced certificate for those who have experience in one or more entertainment disciplines (lighting or sound, etc), covers networking and synchronization of entertainment control systems for application in system contracting, live shows, theme parks, cruise ships, corporate and special events and themed-retail projects.

REQUIRED COURSES IN THE MAJOR		Credits
ENT 2350	Lighting Control Systems for Stage and Studio	3
ENT 2370	Sound Engineering	3
CST 1101	Problem Solving with Computer Programming	3
ENT 2280	Entertainment Control Systems	3
CST 2403	Intro C++ Programming Language I	4
or		
ETN 1102	Principles of Electronics	3
ENT 4480	Show Control	3
TOTAL CREDITS REQUIRED FOR CERTIFICATE		18-19

Certificate in INTERACTIVE MEDIA TECHNOLOGIES

Interactive Media Technologies provides students in design, computer systems, entertainment, and related areas with the opportunity to study the processes, principles, and practices used by interdisciplinary design teams in contemporary media development. The collaborative, project-based learning environment cultivates enthusiasm for the discipline and promotes learning independence which will help students stay relevant in the face of the rapid technological change

REQUIRED COURSES IN THE MAJOR		Credits
IMT 1101	Introduction to Interactive Media Technologies Design Process	3
IMT 1102	Introduction to Interactive Media Technologies Production Practice	3
IMT 1000	Technology Skills Lab	1
Subtotal		7
Choose 9 credits from the following:		
ADV 1260	Digital Imaging	2
ADV 2320	Introduction to Film/Video Production Design	3
ADV 3550	Web Design	3
ADV 3560	Information Design for the World Wide Web	3
BUS 2425	Business Management	3
CST 1101	Problem Solving with Computer Programming	3
CST 1100	Introduction to Computer Systems	3
ARCH 3609	Integrated Software in the Architectural Environment	3
EMT 1250	Digital Control	4
EMT 2370	Computer Hardware Systems	2
EMT 2390L	Operating Systems Laboratory	1
ENT 1280	Ins and Outs of Physical Computing	3
ENT 3140	Topics and Perspectives in Emerging Technologies	3
ENT 3240	Interdisciplinary Team Project	3
ENT 3390	Sound for Multimedia	3
GRA 3607	Digital Data Asset Management	3
HIS 2209	History of Technology	3
IND 1112	Engineer Drawing	2
IND 2304	Advanced Solids Modeling	2
PHIL 2106	Philosophy of Technology	3
PSY 3407	Psychology of Visual Perception	3
TCET 3201	Analog and Digital Communications I	4
TCET 3202	Analog and Digital Communications II	4
TOTAL CREDITS REQUIRED FOR CERTIFICATE		16

Certificate in VIDEO PRODUCTION

The Video Production Certificate program will initiate and/or advance video production careers in film, television, web video, networked distributed video and video for ubiquitous devices. The certificate will provide an educational environment in which students can learn the basics of all aspects of video pre-production, production and post-production techniques.

PREREQUISITE OR EQUIVALENCIES FOR ENTRY

GA 1110	Foundations in Graphic Communications
or	
ADV 1200	Visual Communications (or equivalent experience)
ADV 1117	Typographic Design I (or equivalent)
ADV 1260	Digital Imaging I (or equivalent)
or	
ENT 1101	Introduction to Entertainment Technology
ENT 1250	Lighting Technology
ENT 1270	Sound Technology
or	
Departmental Permission	

REQUIRED COURSES IN THE MAJOR

		Credits
ADV 2320	Introduction to Video Production	3
ENT 1290	Video Studio Operations	3
ADV 3620	Digital Video Design I – Postproduction	3
ADV 3630	Digital Video Design II – Advanced Postproduction – Special Effects	3
ADV 4830	Senior Project – Capstone Digital Video Project	3
ENT 3390	Sound for Multimedia	3
Subtotal		18

CHOOSE ONE COURSE FROM THE FOLLOWING

ADV 3640	3-Dimensional Animation and Modeling	3
ADV 4750	Advanced Web Animation	3
ADV 4720	Multimedia Design I	3
ADV 4820	Multimedia Design II	3
ADV 4860	Streaming Media	3
ADV 3550	Web Page Design and Implementation	3
ENT 3330	Entertainment Video Systems	3
ENT 2370	Sound Engineering	3
ENT 2350	Lighting Controls for Stage and Studio	3
ENT 3350	Lighting Production Techniques	3
ENT 3200	Introduction to Scene Design	3
ENT 1110	Scenery Construction	3
Subtotal		3

TOTAL CREDITS REQUIRED FOR CERTIFICATE

21

COURSES:**ENT 1101
Introduction to
Entertainment Technology***2 cl hrs, 2 cr*

An introduction to the live entertainment technology industry including working methods; processes, equipment and facilities for theatre, opera, dance, concert productions; theme parks; themed- retail; cruise ship venues and corporate special events. 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 1103
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: None

**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 1101; Pre- or corequisite: ENT 1102

**ENT 1190/ADV 2320
Introduction to Film and
Video Production Design***4 cl hrs, 3 cr*

An introduction to the basic components and practices of preproduction 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: ENT 1101; Pre- or corequisite: ENT 1103; OR Prerequisites: MTEC 1101, MTEC 1102 OR Prerequisites: IMT 1101, IMT 1102 (for Entertainment Technology and Emerging Media Technologies Students)

**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 1103, 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 1103. Specific labs will be drawn from entertainment fields of lighting, sound, video, and scenic automation.
Prerequisite: ENT 1101; Pre- or corequisite: ENT 1203

**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 1101; Pre- or corequisite: ENT 1103

**ENT 1260
Music Technology***4 hrs, 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 will work at individual workstations with a variety of software. Rudiments of music theory will be covered. Introduction to synthesis, sequencing, sampling and loop-based composition will be 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 will also be covered.
Prerequisite: ENT 1101; Pre- or corequisite: ENT 1103

**ENT 1270
Sound Technology***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 1101; Pre- or corequisite: ENT 1203

**ENT 2120
Technical Production I***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 corequisites: ENT 1110, ENT 1250, ENT 1260 or ENT 1270

**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.
Prerequisite: ENT 1110

**ENT 2180
Ins and Outs of Physical
Computing***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 will combine a hands-on exploration of sensors and microcontrollers with concepts of interaction design employing a structured design process. Students will work on creative group projects and provide on-line documentation of their work. An array of sensing technologies from simple switches to video tracking will be introduced. Students will use the simple programming of microcontrollers to process incoming data from sensors.
Prerequisite: CST 1101 or higher; Pre- or corequisite: Either ENT 1250 and (ENT 1260 or ENT 1270) or (Prerequisite: MTEC 1250 only)

**ENT 2200
Theatrical Drafting***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: IND 1112; 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.
Prerequisites: ENT 1110, ENT 2120; Pre- or corequisite: ENT 2200

**ENT 2220, ENT 3320, ENT 3420,
ENT 4421, ENT 4422
Technical Production
II, III, IV, V, VI**

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. *Prerequisite: ENT 2120 and for each succeeding level is successful completion of the prior course*

**ENT 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. *Prerequisite: ENT 1260*

**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 2290
Video Studio Operations**

2 cl hrs, 2 lab hrs, 3 cr

An introduction to and overview of the basic techniques and components used in commercial video and film production. Students will work in teams and individually to explore principles of production. Introduction to equipment, process and terminology will be reinforced by readings, lectures and hands-on exposure. A study of the preproduction process, shooting schedules, camera, lighting, and audio operation, and post-production techniques will be explored. Differences between studio and location shooting will be covered. This course is intended as the first of a series of courses designed to provide greater competency in both technical and artistic aspects of this important industry. *Prerequisite: ENT 1190 or ADV 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 Engineering**

2 cl hrs, 2 lab hrs, 3 cr

Students will learn to assess acoustics of performance spaces and analyze the results both with instruments and by ear. With these results, students will then learn to design amplification, acoustical modification and communications systems for professional productions. As a part of the course, they will set up and learn to operate computerized and non-computerized sound control reinforcement and playback systems. *Prerequisite: ENT 1270*

**ENT 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. *Prerequisite: ENG 1121 and (ENT 3200 or ENT 1280 or ENT 2280 or ENT 2370 or ENT 2390)*

**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. *Pre- or corequisites: ENG 1101, IND 1112 and either ENT 1110 or ENT 1250*

**ENT 3240
Interdisciplinary Team
Project**

1 cl hr, 4 lab hrs, 3 cr

This course will provide students with practical experience in the conceptualization and production of collaborative, multi-disciplinary projects. Students will learn how to apply the technology of their major in integration with other technologies. Advanced technologies will be used to solve client needs and practical problems. The course is implemented through several programs, each of which covers specific technological topics of the participating disciplines and is designed as a part of department curricula. Each student participates in one of four laboratories: Experience Design Lab, Digital Media

Lab, Computer Systems Lab, Devices and Displays Lab.

Prerequisites: (ADV 3540 and ADV 3650) or (CST 36xx) OR (ENT 3200 or ENT 1280 or ENT 2280 or ENT 2370 or ENT 3390)

**ENT 3290
Digital Video Camera**

1 cl hr, 4 lab hrs, 3 crs

An intermediate level course in the effective use of camera and lighting in video production. Students will expand on the concepts learned in ENT2290 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 Video Studio Operations or departmental approval*

**ENT 3300
Theatrical CAD**

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. *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. *Prerequisites: ENT 2140, ENT 2200*

**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 student will explore the application

and use of a wide variety of video equipment such as tape- and disc-based video playback devices, production switchers, scan converters, frame synchronizers and video projectors. The second half of the class will focus on practical applications, and the student will design and build video systems for live events and permanent installations and will evaluate the performance of these systems with the aid of test signals and video test equipment. The course will be of interest to students of Entertainment Technology, Electrical Engineering and Art/Advertising Design.

Prerequisite: ENT 2280 or department approval required

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. The areas of film, video, stage and concert lighting production will be covered in depth, 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 will be covered.

Prerequisites: ENT 1250, ENT 2200

ENT 3360 Scene Painting

1 cl hr, 3 lab hrs, 2 cr

An introduction to methods and techniques of painting scenery and properties for the stage. This includes layout for large-scale perspective drawing, the process of working from painter's elevations; use of primers, preservatives, proper brushes; and when to use special application methods, materials and textures. The class will focus on interpretation and reproduction of a variety of professional scenery painters' techniques.

Prerequisite: ENT 1110

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: ADV 3620 or ADV 3650 or ADV 4720 or ENT 1270 or department approval

ENT 3410 Stage Rigging and Mechanics

1 cl hr, 2 lab hrs, 2 cr

A study of the principles and methods used in the rigging and flying of stage scenery and mechanical means of moving scenery on the stage. Emphasis will be on hemp, counterweight and motorized systems; cable drive wagons and turntables; attention to rigging safety and proper care and maintenance of all systems. Field trips include lecture and laboratory demonstrations in working theatrical spaces.

Prerequisite: ENT 2220

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.

Prerequisite: ENT 3320

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.

Prerequisite: ENT 2210; Pre- or corequisites: ENT 3200, ENT 3300

ENT 4430 Project Management

3 cl hrs, 3 cr

An introduction to the methods and problems of running a professional shop and managing projects.

Subjects to be covered 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 (metric vs. US standard measurements, language barriers, conflict resolution, etc.) and political/social issues that affect working relations.

Prerequisites: ENT 3320 and (ENT 2210 or ENT 2370 or ENT 3350)

ENT 4450 Lighting Design

2 cl hrs, 2 lab hrs, 3 cr

An introduction to the aesthetics of scenery lighting as a visual art. Analysis of a script for lighting and the development of a workable design concept. Through this concept and an evaluation of the performers' spatial relationships in the production, students will generate light plots and all of the associated paper work common to a production. Computer software and hardware for this purpose will be used in the laboratory. Additional lab work will include color and angle studies, focusing procedures, the design of projected images, and cueing and record keeping for various production formats.

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.

Pre- or corequisite: ENT 2370 or ENT 3390

ENT 4480 Show Control

2 cl hrs, 2 lab hrs, 3 cr

An investigation of the advanced techniques and practices in the field of show control, emphasizing the use of modern computer-based entertainment control systems. Techniques for integration of lighting, sound, machinery, video and other control systems in live performances, theme parks, themed retail, museum exhibits and new hybrid entertainment forms. Students will get intensive hands-on experience with many entertainment control systems.

Prerequisites: CST 1101, ENT 2280

ENT 4498 Portfolio Presentation

1 lab hr, 1 cr

A seminar that prepares students to present work to employers and clients. Sessions cover presentation techniques, visual presentations, graphics, interactive media presentations, design and technical documentation, interviewing and resumes. Industry employers are invited to a public show of the student's best work at the end of the semester.

Pre- or corequisites: ENT 4900, ENT 4901

ENT 4499 Culmination Project

1 cl hr, a minimum of 5 independent study hrs per wk, 2 cr

This course serves as the senior thesis project. The student will utilize his/her skills in a new and innovative way to develop a project that relates to or has an impact on the entertainment industry. Projects may be developed through courses in the entertainment technology and/or emerging media technology programs. All projects must be approved by the advisor and should demonstrate management, technical design and presentation skills. Documentation of planning, design and realization will be presented to a committee of instructors, both in entertainment technology and related disciplines, as well as to industry professionals; all are to be selected by the students and approved by the advisor. Though students will enroll in the

course during their senior year, development of the project should begin during the second semester of the junior year.

Prerequisites: ENT 4421, ENT 4430 and (ENT 4410 or ENT 4450 or ENT 4470 or ENT 4480)

ENT 4900/ENT 4901 Internship in Entertainment Technology

2 cl hrs every other wk, 135 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 4410 or ENT 4450 or ENT 4470 or ENT 4480 or Pre- or corequisite: MTEC 3800

IMT 1100 Media Technology Skills Lab

0 cl hrs, 3 lab hrs, 1 cr

A series of workshops that offer supportive training in current technology and tools in imaging, video, animation, sound, computational systems, physical computing controls and project management. Six workshops are offered each semester including Image Workshop, Time Workshop, Sound Workshop, Control Workshop, Systems Workshop and Management Workshop. The faculty-supported, workshop environment encourages self-learning which will help students stay relevant in the face of rapid technological change.
Pre- or corequisite: ENG 1101

IMT 1101 Introduction to Interactive Media Technologies Design Process

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: IMT 1100 or MTECH 1001 and ENG 1101

IMT 1102 Introduction to Interactive Media Technologies Production Practices

2 cl hrs, 2 lab hrs, 3 cr

A hands-on introduction to the applied principles and production techniques used in interactive media development. Students will be introduced to the basic principles, practices and technology necessary for success in digital media courses including imaging, sound, video and animation, as well as, interactive, networked and physical computing technologies. The structure of this course emphasizes an integrated and creative approach to interactive media with detailed instruction and practice in the technical aspects of production that go hand-in-hand with critical academic thinking.
Pre- or corequisites: IMT 1100 or MTECH 1001 and ENG 1101

MTEC 1001 Media Technology Skills Lab I

0 cl hrs, 3 lab hrs, 1 cr

One of a series of one-credit workshops that offer supportive training in current technology, and tools in imaging, video, animation, sound, computational systems, physical computing controls, and project management. Multiple short workshops are offered each semester, and students from any skills lab level may select from the offerings, based on availability, advisement, and capabilities. Workshops may include but are not limited to Image Workshop, Time Workshop, Sound Workshop, Control Workshop, Systems Workshop, and Management Workshop. The faculty-supported, workshop environment encourages self-learning, which will help students stay relevant in the face of rapid technological change.
Prerequisite: ENG 1101 OR consent of the program director OR the department chair

MTEC 1002 Media Technology Skills Lab II

0 cl hrs, 3 lab hrs, 1 cr

One of a series of one-credit workshops that offer supportive training in current technology, and

tools in imaging, video, animation, sound, computational systems, physical computing controls, and project management. Multiple short workshops are offered each semester, and students from any skills lab level may select from the offerings, based on availability, advisement, and capabilities. Workshops may include but are not limited to Image Workshop, Time Workshop, Sound Workshop, Control Workshop, Systems Workshop, and Management Workshop. The faculty-supported, workshop environment encourages self-learning, which will help students stay relevant in the face of rapid technological change.
Prerequisite: ENG 1101 OR approval of the program director OR the department chair

MTEC 1210 Media Design Foundation

2 cl hrs, 2 lab hrs, 3 cr

A cross-disciplinary foundation presenting design principles and applied concepts for all creative disciplines, including media design, computing, and engineering. Using case studies, brainstorming, and idea generation, students learn creative thinking and problem solving techniques to enhance usability, influence perception, increase appeal, and make better design decisions.

Pre- or corequisites: IMT 1100 or MTECH 1001 or MTECH 1002 and MTEC 1250 and CST 1101

MTEC 1250 Tangible Media Foundation

2 cl hrs, 2 lab hrs, 3 cr

Focuses on the human side of technology. Students investigate the reasoning behind different materials selections and the technology behind products, such as touch screens, iPods, and other electronics designed for human interaction.
Pre- or corequisites: IMT 1100 or MTECH 1001 or MTECH 1002 and CST 1101

MTEC 2001 Media Technology Skills Lab III

0 cl hrs, 3 lab hrs, 1 cr

One of a series of one-credit workshops that offer supportive training in current technology, and tools in imaging, video, animation, sound, computational systems, physical computing controls, and project management. Multiple short workshops are offered each semester, and students from any skills lab level may select from the offerings, based on availability, advisement, and capabilities. Workshops may include but are not

limited to Image Workshop, Time Workshop, Sound Workshop, Control Workshop, Systems Workshop, and Management Workshop. The faculty-supported, workshop environment encourages self-learning, which will help students stay relevant in the face of rapid technological change.
Prerequisite: MTEC 1001 OR MTEC 1002 OR IMT 1100 OR approval of the program director OR the department chair

MTEC 2002 Media Technology Skills Lab IV

0 cl hrs, 3 lab hrs, 1 cr

One of a series of one-credit workshops that offer supportive training in current technology, and tools in imaging, video, animation, sound, computational systems, physical computing controls, and project management. Multiple short workshops are offered each semester, and students from any skills lab level may select from the offerings, based on availability, advisement, and capabilities. Workshops may include but are not limited to Image Workshop, Time Workshop, Sound Workshop, Control Workshop, Systems Workshop, and Management Workshop. The faculty-supported, workshop environment encourages self-learning, which will help students stay relevant in the face of rapid technological change.
Prerequisite: MTEC 1001 OR MTEC 1002 OR IMT 1100 OR approval of the program director OR the department chair

MTEC 2120 Interaction Design I

2 cl hrs, 2 lab hrs, 3 cr

Fundamentals of design techniques facilitating interaction through media. Introduction to theories, models, and frameworks for designing user experiences for social and personal media, as well as to the ethnographic methods applied to understanding the space, users and their environment. Makes use of storyboards, use cases, situation design, situated devices and embodied interaction.
Pre- or corequisites: MTEC 1210 and CST 1101

MTEC 2125 Narrative Design

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.
Pre- or corequisites: MTEC 1210, MTEC 1250, CST 1101

MTEC 2160 Performance Design I

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.
Pre- or corequisites: MTEC 1210 and CST 1101

MTEC 2175 Ecological Design I

2 cl hrs, 2 lab hrs, 3 cr
 An introduction to the principles and practices of eco-effectiveness as they relate to the design of environments, products, and systems. Examination of scientific principles and design approaches, such as biomimicry, diversity, and cradle-to-cradle design process. Students engage in collaborative online discussions, hands-on experiments and interviews, and produce a tangible, final project.
Pre- or corequisites: MTEC 1210, CST 1101

MTEC 3001 Media Technology Skills Labs V

0 cl hrs, 3 lab hrs, 1 cr
 One of a series of one-credit workshops that offer supportive training in current technology, and tools in imaging, video, animation, sound, computational systems, physical computing controls, and project management. Multiple short workshops are offered each semester, and students from any skills lab level may select from the offerings, based on availability, advisement, and capabilities. Workshops may include but are not limited to Image Workshop, Time Workshop, Sound Workshop, Control Workshop, Systems Workshop, and Management Workshop. The faculty-supported, workshop environment encourages self-learning, which will help students stay relevant in the face of rapid technological change.
Prerequisite: MTEC 2001 OR MTEC 2002 OR approval of the program director OR the department chair

MTEC 3002 Media Technology Skills Labs VI

0 cl hrs, 3 lab hrs, 1 cr
 One of a series of one-credit workshops that offer supportive training in current technology, and

tools in imaging, video, animation, sound, computational systems, physical computing controls, and project management. Multiple short workshops are offered each semester, and students from any skills lab level may select from the offerings, based on availability, advisement, and capabilities. Workshops may include but are not limited to Image Workshop, Time Workshop, Sound Workshop, Control Workshop, Systems Workshop, and Management Workshop. The faculty-supported, workshop environment encourages self-learning, which will help students stay relevant in the face of rapid technological change.
Prerequisite: MTEC 2001 OR MTEC 2002 OR approval of the program director OR the department chair

MTEC 3230 Introduction to Interactive 3D Environments Programming

2 cl hrs, 2 lab hrs, 3 cr
 This course provides students with technical foundations and opportunity to work with state of the art virtual reality (VR) systems and interactive 3D environments. The foundations covered in this course apply to computer games, 3D film production, immersive environments, and virtual scenery for live performance. Students will be prepared to apply and extend basic skills in modeling, scripting and programming. Emphasizes production, teamwork, analysis of interactive 3D systems, and applications-driven user experiences with assessment of aesthetic orientation.
Prerequisites: MTEC2120, CST1101, MAT1280

MTEC 3240 Interactive Sound for Games and Simulations

2 cl hrs, 2 lab hrs, 3 cr
 An introduction to interactive sound for games and simulation-based media. The technical skills and foundations covered apply to game audio, interactive music performance, and interactive media scores. Students learn to use game audio engines, sound computation basics, and open source and proprietary tools. Professional audio quality standards are emphasized, and aesthetic sensitivity for final product is developed. For final projects, students design and program a complete sound environment for a game scene or interactive simulation.
Prerequisites: CST1101, ENT1260, ENT3390

MTEC 3800 Interdisciplinary Team Project I

1 cl hrs, 4 lab hrs, 3 cr
 An introductory 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 ADV, CST, ENT, IND, MECH; open to others by permission of the program director.
Prerequisite: Choose ONE (1) of the following: ADV 3540 OR ADV 3551 OR CST 1201 OR CST 2309 OR ENT 1280 OR ENT 2280 OR ENT 2370 OR ENT 3200 OR ENT 3390 OR IND 2313 OR MECH 1240 OR approval of the program director

MTEC 4800 Interdisciplinary Team Project II

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 ADV, CST, ENT, IND, MECH; open to others by permission of the program director.
Prerequisite: MTEC 3800 OR ENT 3240 OR approval of the program director

MTEC 4801 Interdisciplinary Team Project III

1 cl hrs, 2 lab hrs, 3 cr
 An advanced 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 will be used to solve client needs and practical problems. The following laboratories are available in all sequences: Experience Design Lab, Digital

Media Lab, Computer Systems Lab, and Devices and Displays Lab. Open to students in ADV, CST, ENT, IND, MECH; open to others by permission of the program director.
Prerequisite: MTEC 4800 OR approval of the program director

Environmental Control Technology

Professor Anthony Treglia, Chair
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PROGRAMS:

Environmental Control Technology/AAS
Facilities Management/BTech
Air Conditioning Equipment Technician/Cert
Building/Housing Superintendent Technology/Cert
Heating Equipment Technician/Cert
Sustainable Technology/Cert

FACULTY:

Assistant Professors: 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, 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. See page 254 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.

REQUIRED COURSES IN THE MAJOR		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
Select one of the following five courses for 3 credits:		3
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 2900	Internship	
Select one of the following three courses:		
BIO 1101	Biology I	4
CHEM 1110	General Chemistry I	
PHYS 1433	Physics 1.2	4
or		
PHYS 1441	Physics 1.3	5
Subtotal		41-42

ADDITIONAL REQUIRED COURSES

ENG 1101	English Composition I	3
MAT 1275 ¹	College Algebra and Trigonometry	4
COMM ³	Communications	3
LAP ³	Literature/Aesthetics/Philosophy	3
BS/SS ³	Behavioral Science/Social Science	3
ELECTIVE	COMM, BS/SS, MAT, SCI II, LAP, AFR, PRS, FL2, or MST 1101 ²	3
Subtotal		19

TOTAL CREDITS REQUIRED FOR THE DEGREE 60-61

¹ Students without the requisite math background for MAT 1275 will be required to take MAT 1175 in preparation. This will increase the number of credits required for the degree by four (4).

² These courses are not transferable into the BTech degree.

³ See page 35 for a detailed explanation of core-required courses and categories.

Bachelor of Technology in FACILITIES MANAGEMENT

Administered by the departments of Architectural Technology,
Construction Management Technology, Environmental Control
Technology, Law and Paralegal Studies

Professor Anthony Treglia, Program Director
Environmental Center, room E 206
718.260.5160
email: atreglia@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 discipline, from City Tech or other colleges, can enter the baccalaureate program after taking approximately 22 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 Anthony Treglia, the program director.

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 Anthony Treglia, the program director.

REQUIRED COURSES IN THE MAJOR**AAS Degree****Credits****60**

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 ¹	Internship Project	3
or		
FMGT 4902 ¹	Special Projects in Facilities Management	3
LAW 2306	Legal Issues for Facilities Managers	3

Subtotal**30**

CONCENTRATION AREAS

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	
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FMGT 4780	Programming and Introduction to Space Planning	
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ELECTIVE (Program approval required)

Space Planning and Design

FMGT 4780	Programming and Introduction to Space Planning	3
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FMGT 4880	Space Planning	3
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Select one of the following three courses for 3 credits: 3

FMGT 4750	Mechanical Systems Operation and Maintenance I	
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FMGT 4770	Urban Housing Management I	
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ELECTIVE (Program approval required)

Facility Engineering

FMGT 4750	Mechanical Systems Operation and Maintenance I	3
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FMGT 4850	Mechanical Systems Operation and Maintenance II	3
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Select one of the following three courses for 3 credits: 3

FMGT 4760	Construction Planning and Management I	
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FMGT 4780	Programming and Introduction to Space Planning	
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ELECTIVE (Program approval required)

Urban Housing Management

FMGT 4770	Urban Housing Management I	3
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FMGT 4870	Urban Housing Management II	3
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Select one of the following three courses for 3 credits: 3

FMGT 4750	Mechanical Systems Operation and Maintenance I	
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FMGT 4760	Construction Planning and Management I	
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ELECTIVE (Program approval required)

Subtotal 9

REMAINING CORE DISTRIBUTION AND ELECTIVES²

Required courses depend on the courses used to satisfy the AAS degree requirements. Students should consult their advisor.

Subtotal 21

TOTAL CREDITS REQUIRED FOR THE DEGREE 120

¹ The program faculty will determine if appropriate to take FMGT 4900 or FMGT 4902. Those students without sufficient experience in the facilities management field will be required to take FMGT 4900. All others will take FMGT 4902.

² See page 35 for a detailed explanation of core-required courses and categories.

FMB lower-level course requirements for students electing the 0–4 BTech FM option.

REQUIRED FOR DEGREE

		Credits
ARCH 1121	History of Architectural Technology	2
ARCH 1140	Materials in Architecture	2
CMCE 1110	Construction Drawings I	2
ENVC 1110	Principles of Air Conditioning I	3
SUPT 1104	Building Management, Sanitation and Codes	3
ARCH 1240	Methods of Construction in Architecture	2
ARCH 1290	Architectural CAD	2
ENVC 1210	Combustion Processes and Equipment	3
ENVC 1250	Fire Protection, Plumbing and Electrical Systems for Buildings	3
ENVC 2321	Air Conditioning Systems Laboratory II	1
ENVC 2322	Principles of Air Conditioning II	3

Select one course from the following two:

ARCH 2370	Architectural Environmental Systems	3
CMCE 2419	Building Service Systems	2

Subtotal min. 28

ADDITIONAL REQUIRED COURSES

ENG 1101	English Composition I	3
MATH I ²	Mathematics	4
SCI I	Laboratory Science	4
SOC 1102	Urban Sociology	3
SPE 1330	Effective Speaking	3
LAP ¹	Literature/Aesthetics/Philosophy	6
BS/SS ¹	Behavioral Science/Social Science	3
ELECTIVES ¹		min. 5

Subtotal min. 31

TOTAL CREDITS REQUIRED FOR LOWER DIVISION 60

¹ See page 35 for a detailed explanation of core-required courses and categories.

² Students without the requisite math background for MATH I will be required to take lower-level MA in preparation. This will increase the number of credits required for the degree by four (4).

CERTIFICATE PROGRAMS

The Environmental Control Technology Department has four certificate programs: sustainable technology, air conditioning equipment technician, heating equipment technician and building/housing superintendent technology, which fulfill the needs of individuals who:

- already have a degree in another field but are looking for a career change;
- already are employed in the field and are looking to advance; or
- are looking to attain employment skills. While the certificates are a meaningful credential, individuals without a degree are encouraged to complete a degree program to further enhance their opportunities.

Transfer Opportunities

All the environmental control technology and sustainable technology courses in the certificate programs can be applied toward degrees in their respective majors. Only the four specific building/housing superintendent technology courses cannot be applied toward a degree.

Evening Program

All courses in the certificate programs curriculum are offered in the College's evening session. Certificate requirements can be completed without taking courses during the day.

ADMISSIONS REQUIREMENTS

Admission to the Air Conditioning Equipment Technician, Heating Equipment Technician and Building/Housing Superintendent programs require the following qualifications:

- High school diploma or General Equivalency Diploma.
- Students must take the CUNY proficiency tests in writing, reading and mathematics. Transfer students with baccalaureate degrees are exempt from this provision.
- Students must be placed in the appropriate developmental courses.
- Students must be CUNY proficient in reading, writing and mathematics to receive a certificate.

Certificate in SUSTAINABLE TECHNOLOGY

See page 182

Certificate in AIR CONDITIONING EQUIPMENT TECHNICIAN

This curriculum provides the theoretical, design and practical knowledge that is essential to being able to service, design and install modern industrial, commercial and residential refrigeration and air conditioning systems. Students begin the program by learning lower-level fundamentals, and progress to the refrigeration and air conditioning courses.

Air Conditioning Certificate Learning Outcomes

Understanding of the fundamentals and sufficiently advanced principles to secure employment as an air conditioning technician, an outside contractor, or in-house maintenance technician

REQUIRED COURSES IN THE MAJOR

		Credits
ENVC 1110	Principles of Air Conditioning I	3
ENVC 1111	Air Conditioning Systems Laboratory I	1
ENVC 1120	HVAC Systems Graphics	2
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
	Select one of the following four courses for 3 credits:	3
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	
TOTAL CREDITS REQUIRED FOR CERTIFICATE		21

Certificate in HEATING EQUIPMENT TECHNICIAN

Advances in heating equipment, and an increased emphasis on energy conservation and pollution control, have created a need for well-trained, technically qualified service technicians. Students begin the program by learning the underlying principles of heat transfer, and advance to upper-level courses where they study combustion processes, hydronic systems design, sizing and selection of pumps and domestic hot water systems, wiring practices, testing, service and adjustment of oil and gas-fired heating systems.

Heating Certificate Learning Outcomes

Understanding of the fundamentals and sufficiently advanced principles to secure employment as a heating equipment technician, an outside contractor, or in-house maintenance technician.

REQUIRED COURSES IN THE MAJOR		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
TOTAL CREDITS REQUIRED FOR CERTIFICATE		16

Certificate in BUILDING/HOUSING SUPERINTENDENT TECHNOLOGY

This 30-credit certificate program in Building/Housing Superintendent Technology prepares students to operate, maintain and manage multi-family residential buildings. Graduates can have careers as superintendents, assistant superintendents, directors of maintenance, maintenance mechanics, building managers, building services contractors, building custodians and building owners.

The Building/Housing Superintendent curriculum encompasses heating, boilers and combustion of fuels, building maintenance and repair, operation of building mechanical systems, electrical systems and multi-family building management, sanitation and codes.

Classroom lectures and demonstrations provide a solid theoretical foundation. Intensive practical training is presented in modern and well-equipped air conditioning, combustion and tool skills laboratories.

Graduates and undergraduates from other institutions can transfer to City Tech's Superintendent Technology program. The College grants credit for general education courses and for technical courses that are similar in content to building/housing superintendent technology.

Building/Housing Superintendent Technology Certificate Learning Outcomes

Students are prepared to operate and manage large residential buildings by learning the fundamental principles of heating, air conditioning, and building mechanical systems, and hands-on skills in carpentry, plumbing, heating systems and general maintenance.

REQUIRED COURSES IN THE MAJOR		Credits
SUPT 1103	Building/Housing Superintendent Carpentry Laboratory	1
SUPT 1104	Multi-Dwelling Management, Sanitation and Codes	3
SUPT 1206	Building/Housing Superintendent Plumbing Laboratory	1
SUPT 1261	Building Maintenance and Repair Laboratory	2
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 1250	Fire Protection, Plumbing and Electrical Systems for Buildings	3
Subtotal		20
ADDITIONAL REQUIRED COURSES		
ENG 1101	English Composition I	3
MAT 1175	Fundamentals of Mathematics	4
BS/SS ¹	Behavioral Science/Social Science	3
Subtotal		10
TOTAL CREDITS REQUIRED FOR CERTIFICATE		30

¹ See page 35 for a detailed explanation of core-required courses and categories.

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 1275

**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 1275;
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 1275

**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 3561***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 2610, 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 2610, 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

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718.260.5233
email: sberri@citytech.cuny.edu

PROGRAMS:

Mechanical Engineering Technology/BTech
Mechanical Engineering Technology/AAS
Industrial Design Technology/AAS

FACULTY:

Professor: Berri
Associate Professors: Vaisman, Zhang
Assistant Professors: Amaya-Bower, Brahim, Gailani, Nakamura

CLTs: Bennani, Martinez

Associate in Applied Science in MECHANICAL ENGINEERING TECHNOLOGY

The Mechanical Engineering Technology program, accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/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

Programs are accredited by the Technology Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: 410.347.7700.

The Mechanical Engineering Technology program educational objectives are as follow:

- Graduates should be able 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.
- Graduates should be able to be enrolled in a four-year mechanical engineering/industrial design/technology-related program to continue their study.
- Graduates should practice effective oral, written and graphical communication skills.

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 such as the program offered by SUNY Farmingdale in Manufacturing Engineering Technology and by City Tech's Computer Engineering Technology Department, formerly called electromechanical engineering technology.

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.

REQUIRED COURSES IN THE MAJOR

		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	4
	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
	Subtotal	32

ADDITIONAL REQUIRED COURSES

ENG 1101	English Composition I (core)	3
EET 1122	Networks I	4
MAT 13752	Precalculus (core)	4
MAT 1475	Calculus I	4
PHYS 1433	Physics 1.2	4
	or	
PHYS 1441	Physics 1.3	5

PHYS 1434	Physics 2.2	4
	or	
PHYS 1442	Physics 2.3	5
COMM ¹	ENG 1121 or ENG 1133	3
LAP ¹	Literature/Aesthetics/Philosophy	3
BS/SS ¹	Behavioral Science/Social Science	3
	Subtotal	32-34
TOTAL CREDITS REQUIRED FOR THE DEGREE		64-66

¹ See page 35 for a detailed explanation of core-required courses and categories.

² Students without the requisite math background to enter MAT 1375 may be required to take MAT 1175 and/or MAT1275 in preparation. This will increase the number of required credits for the degree by up to eight (8).

MECH 2426	Materials Testing Laboratory	1
MECH 2430	Thermodynamics	3
EET 1122	Networks I	4
LAP ¹	Literature/Aesthetics/Philosophy	3
BS/SS ¹	Behavioral Science/Social Science	3
	Subtotal	18
TOTAL CREDITS REQUIRED FOR THE DEGREE		64-66

¹ See page 35 for a detailed explanation of core-required courses and categories.

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	4
ENG 1101	English Composition I	3
PHYS 1433	Physics 1.2	4
	or	
PHYS 1441	Physics 1.3	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	4
COMM	ENG 1121 or ENG 1133	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	Physics 2.2	4
	or	
PHYS 1442	Physics 2.3	5
	Subtotal	15-16
FOURTH SEMESTER		
MECH 2410	Machine Design	4
	or	
MECH 2900	Internship to Mechanical Engineering Technology	4

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.

REQUIRED COURSES IN THE MAJOR:		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
Subtotal		33
ADDITIONAL REQUIRED COURSES		
ENG 1101	English Composition I	3
MAT 12752	College Algebra and Trigonometry	4
MAT 1375	Precalculus	4
PHYS 1433	Physics 1.2	4
	or	
PHYS 1441	Physics 1.3	5
COMM ¹	Communications	3
LAP ¹	Literature/Aesthetics/Philosophy	3
BS/SS ¹	Behavioral Science/Social Science	6
Subtotal		27-28
TOTAL CREDITS REQUIRED FOR THE DEGREE		60-61

¹ See page 35 for a detailed explanation of core-required courses and categories.

² Students without the requisite math background to enter MAT 1275 may be required to take MAT 1175 in preparation. This will increase the number of required credits for the degree by four (4).

Bachelor of Technology in Mechanical Engineering Technology

This multidisciplinary curriculum addresses both theory and hands-on experience with industry-standard tools in manufacturing and industrial design, 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.

The program introduces students to leading-edge technology. The powerful 3-D based parametric CAD and CAD/CAM packages (Autodesk Inventor, Solidworks, MasterCAM, Pro/Engineer, MAYA, 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

REQUIRED COURSES IN THE MAJOR		Credits
MECH 3500	Computer Programming and Applications	3
MECH 3510	Advanced Solid Modelling 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 Management	2
MAT 1575 ¹	Calculus II	4
MAT 2680	Differential Equations	3
Subtotal		33
OTHER REQUIREMENTS²		
COMM	Communications	3
LIT	Literature	3
LAP	Literature, Aesthetics/Philosophy	3
BS/SS	Behavioral Science/Social Science	6
Subtotal		15
TOTAL CREDITS REQUIRED FOR THE DEGREE		48
<p>In addition to the above, students must complete either the general concentration in Mechanical Engineering Technology by completing 12 credits from the first list below, or the concentration in Manufacturing Systems by completing twelve credits from the second list below.</p>		
GENERAL 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 3D Animation	3
MANUFACTURING SYSTEMS		
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
Subtotal		12
Credits from AAS³		60-64
TOTAL CREDITS REQUIRED FOR THE DEGREE⁴		120-124

¹ Students not eligible for MAT 1575 may be required to take MAT 1275, MAT 1375, and/or MAT 1475, as determined by academic record, adding up to 12 credits to the number required for graduation.

² Courses satisfying these Core Curriculum requirements can be found starting on page 35.

³ Dependent upon major. Students entering the program from another major may be required to complete additional coursework. It is recommended that prospective students consult with a departmental advisor at the earliest possible point.

4 Students entering the Bachelor with an AAS in IND must also complete MAT 1475 and PHYS 1434 or PHYS 1442 but are not required to take MECH 3550, Simulation and Visualization, IND 4740, Project Management and the second elective in BS/SS.

Curriculum by Semester

BTech - General Concentration (Mechanical Engineering Technology)

FIRST SEMESTER	Credits	
MECH 3500	Computer Programming and Applications	3
MECH 3550	Simulation and Visualization	3
MECH 3510	Advanced Solid Modeling II	
or		
MECH 3520	Rapid Prototyping	3
MAT 1575	Calculus II	4
BS/SS	Elective	3
Subtotal		16
SECOND SEMESTER		
MAT 2680	Differential Equations	3
MECH 3600	Mechanical Measurements and Instrumentation	3
MECH 3610	Product Design I	3
MECH 3650	Advanced Strength of Materials	3
COMM	Elective	3
Subtotal		15
THIRD SEMESTER		
MECH 4700	Fluid Mechanics	3
MECH 4710	Product Design II	3
MECH 4730	Finite Element Methods	3
MECH 4860	Project Management	2
BS/SS	Elective	3
Subtotal		14
FOURTH SEMESTER		
MECH 4760	Vibration and Advanced Dynamics	3
MECH 4800	Advanced 3D Animation	3
MECH 4850	Senior Design Project	3
LIT	Elective	3
LAP	Elective	3
Subtotal		15
TOTAL CREDITS REQUIRED FOR THE DEGREE		60

Curriculum by Semester

BTech - Manufacturing Systems (Mechanical Engineering Technology)

FIRST SEMESTER		Credits	
MAT 1575	Calculus II		4
MECH 3500	Computer Programming and Applications		3
MECH 3550	Simulation and Visualization		3
MECH 3530	Advanced Engineering Materials or		
MECH 3540	Manufacturing Systems		3
BS/SS	Elective		3
Subtotal			16
SECOND SEMESTER			
MAT 2680	Differential Equations		3
MECH 3600	Mechanical Measurements and Instrumentation		3
MECH 3620	Advanced Manufacturing Processes		3
MECH 3650	Advanced Strength of Materials		3
COMM	Elective		3
Subtotal			15
THIRD SEMESTER			
MECH 4700	Fluid Mechanics		3
MECH 4720	Plastics Product Manufacturing		3
MECH 4730	Finite Element Methods		3
MECH 4860	Project Management		2
BS/SS	Elective		3
Subtotal			14
FOURTH SEMESTER			
MECH 4800	Advanced 3D Animation		3
MECH 4820	Computer-Integrated Manufacturing		3
MECH 4850	Senior Design Project		3
LIT	Elective		3
LAP	Elective		3
Subtotal			15
TOTAL CREDITS REQUIRED FOR THE DEGREE			60

COURSES:**IND 1112****Engineering Drawing I****1 cl hr, 3 lab hrs, 2 cr*

Introduction to CAD working environment, basic 2-D 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, 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 3-D 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 2-D 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 2-D plant layout and a 3-D 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*

**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*

**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*

**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*

**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 equivalent*

**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. *Prerequisites: IND 1112, MECH 1233; Corequisite: MAT 1375*

**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*

**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, IND 2304; 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, 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, MAT 1375, PHYS 1433; Corequisites: MAT 1475, PHYS 1434*

**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*

**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

**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

**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, MAT 1575

**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

**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 4800
Advanced 3D 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

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Alumnus, Alpha Teleconnect Mushipi Ivoh Service Specialist, Siemens

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Mark Turturro

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Danne Ventura

Director, Professional Relations, Essilor of America

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	Community Mediation Services, Inc.	New York City Human Resources Administration	United Cerebral Palsy
Administration for Children's Services	Concord Family Services, Inc.	New York Methodist Hospital/Caregiver's Program	United Community Centers
Agency for Child Development	Covenant House	NYU Downtown Hospital	Urban Strategies Day Care II
Alpha School Center for Progressive Living	Crown Heights Service Center	New York University Hospital for Joint Diseases	Urban Women's Shelter
American Red Cross of Greater New York, Brooklyn Chapter	Day Top Village	Office of the District Attorney (Kings County)	Victims Services Agency
Bedford Stuyvesant Family Center	Dominican Sisters Family Health Service	Park Slope Shelter	Village Nursing Home
Bishop Henry B. Hucles Episcopal Home	East Harlem Neighborhood Based Alliance	Parkway Hospital	Woodhull Medical and Mental Health Center
B.R.C. Human Services Corporation	Family Justice Center	Planned Parenthood	Woodhull Outpatient Clinic
Brooklyn Aids Task Force	FECS, Inc.-Twin Bridges Clubhouse	Project Ace (NADAP)	Wyckoff Heights Medical Center
Brooklyn Bureau of Community Services Inc.	Flatbush Addiction Center	Project Chance	YAI/National Institute for People with Disabilities
Brooklyn Community Housing and Services Inc.	Flatbush Haitian Center	Project Teen Aid	Young Adult Institute
Brooklyn Developmental Disabilities Center	Fort Greene SNAP	P.S. 44	YWCA
Brooklyn Domestic Violence Court	Friends of Crown Heights	P.S. 137	
Brooklyn Hospital	Green Chimneys Children's Services	P.S. 151	
Brooklyn Residential Center-OCFS	Housing Works	P.S. 161	
Caribbean Women's Center	Human Resources Administration	Queens Center for Progress	
Catholic Charities of Brooklyn	Incarcerated Mothers Program	Queens Village Committee for Mental Health for J-CAP, Inc.	
Center for Family Life	Independent Living Association	RAICES	
Chelsea Adult Day Health Center	I.S. 59	Ridgewood Bushwick Home Care Agency	
Cobble Hill Nursing Home	I.S. 126 The Albert Shanker School	Rutland Nursing Home	
ComAlert	Jackie Robinson Center for Physical Culture	Safe Horizon-Families of Homicide Victims Program	
Community Counseling and Mediation	Jewish Community Center of Canarsie	Salvation Army, Bond Street	
	Jewish Hospital and Medical Center of Brooklyn	Science Skills Center High School	
	Kingsboro Addiction Treatment Center	SCO Family of Services	
	Kings County Hospital Center	Self Help Community Services, Inc.	
	Lower East Side Service Center	Shore View Nursing Home	
	Metropolitan Jewish Geriatric Center	St. John's Bread of Life	
	Middle School 126	St. Vincent's Service	
	Middle School 352	The Bowery Mission Women's Center	
	New Hope Guild	The Dennelesse Corporation	
	New York Center for Addiction Treatment Services	The New York Methodist Hospital	
	New York City Department of Juvenile Justice	Turning Point/Discipleship Outreach Ministries Inc.	

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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	Page in Catalog
5317	Air Conditioning Equipment Technician	Environmental Control Technology	256
5506	Alcohol and Substance Abuse	Human Services	139
5317	Building/Housing Superintendent Technology	Environmental Control Technology	257
5317	Construction Management	Construction and Civil Engineering Technology	225
5012	Desktop Publishing	Advertising Design and Graphic Arts	189
5317	Heating Equipment Technician	Environmental Control Technology	257
5008	Interactive Media Technologies	Entertainment Technology	247
5399	Lighting Systems Technology	Entertainment Technology	246
5399	Scenery Construction	Entertainment Technology	246
5399	Show Control	Entertainment Technology	246
5399	Sound Systems Technology	Entertainment Technology	245
5317	Sustainable Technology	School of Technology and Design	182, 201, 225, 256
0899.5	Technology Teacher Education Transitional C	Career and Technology Teacher Education	128
0605	Video Production	Entertainment Technology	247

Tuition and Fees

Tuition: Resident Students

- Full-time matriculated.....\$2,565 per semester
- Part-time matriculated.....\$215 per credit
- All Non-degree\$320 per credit
- Senior citizen fee..... \$65 per semester or session

Tuition: Non-Resident Students

- Full-time matriculated\$460 per credit
- Part-time matriculated.....\$460 per credit
- All Non-degree\$680 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 \$42.70
- Student Government..... \$4.00 and Clubs \$3.00
- University Student Senate Fee \$0.85
- NYPIRG Fee \$4.00
- Technology Fee..... \$100
- Consolidated Fee \$15.00
- Total Fees\$169.55**

Part-Time Students (Fewer than 12 credits and/or remedial contact hours) per semester

- Student Activity Fee \$16.35
- Student Government..... \$1.50 & Clubs: \$1.50
- University Student Senate Fee..... \$0.85
- Technology Fee..... \$50
- Consolidated Fee \$15.00
- Total Fees\$85.20**

The City Tech certificate programs prepare people for the following professions, as classified using the current Federal Standard Occupational Code (SOC):

Air Conditioning Equipment Technician

49-9020 Heating, Air Conditioning and Refrigeration Mechanics and Installers

Alcohol and Substance Abuse (CASAC) certificate

21-1011 Substance Abuse and Behavioral Disorder Counselor

Building/Housing Superintendent Technology

37-1010 First-Line Supervisor of Buildings and Grounds Cleaning and Maintenance Workers

49-9099 Installation, Maintenance and Repair Workers, All Others

Construction Management

47-1011 Supervisors of Construction and Extraction Workers

Desktop Publishing

43-9030 Desktop Publishers

Heating Equipment Technician

49-9020 Heating, Air Conditioning and Refrigeration Mechanics and Installers

Interactive Media Certificate

27-3099 Media and Communication Workers, All Other

Lighting Systems Certificate

27-4099 Media and Communication Equipment Workers, All Other

27-4011 Audio and Video Equipment Technicians

Scenery Construction Certificate

27-4099 Media and Communication Equipment Workers, All Other

Show Control Certificate

27-4099 Media and Communication Equipment Workers, All Other

Sound Systems Certificate

27-4010 Broadcast and Sound Engineering Technicians and Radio Operators

27-4011 Audio and Video Equipment Technicians

27-4012 Broadcast Technicians

27-4013 Radio Operators

27-4014 Sound Engineering Technicians

Sustainable Technology

17-3025 Environmental Engineering Technicians

Technology Teacher Education Transitional C

25-2023 Career/Technical Education Teachers, Middle School (provisional)

25-2032 Career/Technical Education Teachers, Secondary School (provisional)

Video Production Certificate

27-4031 Camera Operators, Television, Video, and Motion Picture

27-4032 Film and Video Editors

27-4011 Audio and Video Equipment Technicians

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Adult Learning Center	49	CASAC Studies Program/Certificate	139
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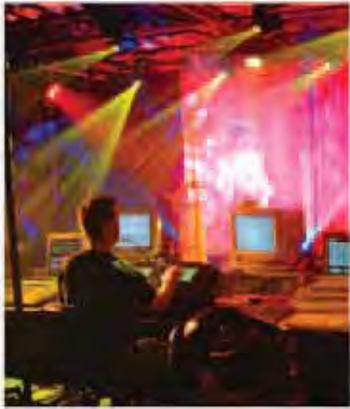
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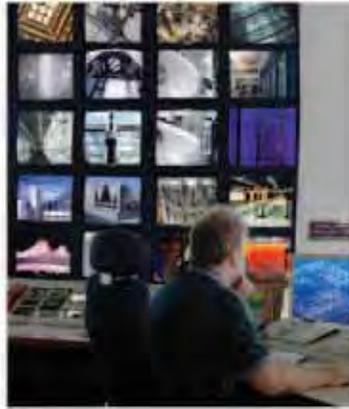
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