



Math Education Student Handbook

Department of Mathematics
New York City College of Technology
The City University of New York (CUNY)

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Preface

This handbook is primarily for Mathematics Education Teacher Candidates (Grades 7-12). The handbook is subject to change at any time. Information in the college catalogue supersedes information in this handbook. The handbook is divided into the following chapters.

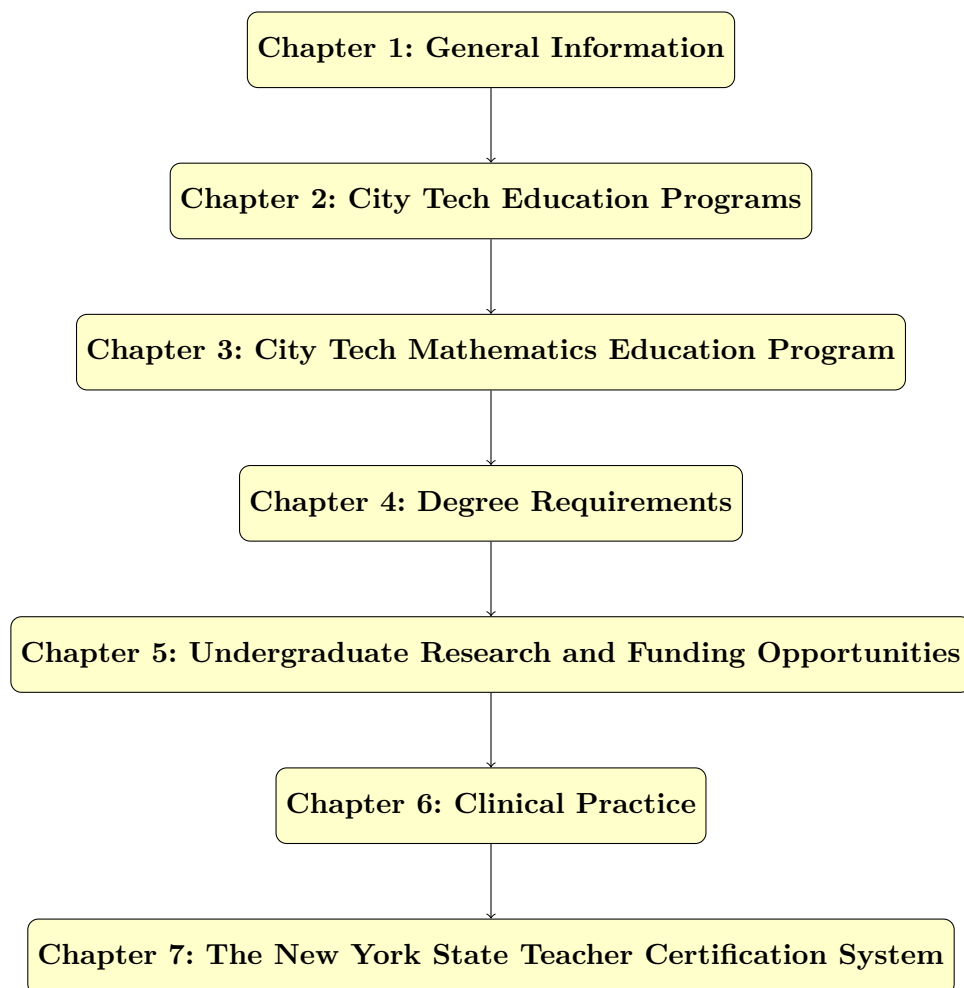


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Letter from the Director

Dear Teacher Candidates:

Welcome to the Mathematics Education Program and community of teacher candidates, alumni, faculty and teacher mentors. We are proud of our Mathematics Education program, our teacher candidates, and program alumni and hope you find our program helpful as you strive to obtain New York State Teacher Certification. We welcome all input from teacher candidates, partnering teachers, and faculty. Please visit [our website](#) and contact us with any comments, questions or concerns. We look forward to working with you and wish you success in your professional endeavors.

Sincerely,
Nadia Kennedy
Mathematics Education Program, Director



BACHELOR OF SCIENCE IN MATHEMATICS EDUCATION

SHARE YOUR LOVE OF MATH WITH STUDENTS! BECOME A MATHEMATICS TEACHER!

EARN TWO TEACHING LICENSES SIMULTANEOUSLY:
Mathematics (Grade 7-12) and Computer Science



**The ONLY Mathematics Teacher Preparation Program in NYC
hosted by a Mathematics Department**

Program Overview

- Provides exceptional preparation for aspiring math teachers
- Leads to Bachelor of Science in Mathematics Education and a teaching certificate grades 7-12
- Offers an opportunity to earn an additional teaching certificate in Computer Science
- Prepares students for graduate school
- Centrally located in Downtown Brooklyn, near all subways

Program Benefits

- Dedicated faculty and supportive peer community
- Academic support and teacher certification exam preparation
- Financial support through multiple grants
- Low tuition, which helps avoid student debt

NYC Schools Need Mathematics Teachers

- With math teachers in high demand, you will never be without a job!
- NYC mathematics teacher salaries: **Entry:** \$61,070; **Median:** \$88,937; **Experienced:** \$128,657
- Benefits include: health insurance, pension, job security, and summer vacation

Contact: Professor Nadia Kennedy | nkennedy@citytech.cuny.edu



WHERE CAN TECHNOLOGY TAKE YOU?



Figure 1: Flyer of the Mathematics Education Program at City Tech.

Chapter 1

General Information

1.1 College's Mission Statement

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

1.2 Educational Goals

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

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

1.3 Accreditation

New York City College of Technology is fully accredited by the Board of Regents of the University of the State of New York, the Middle States Commission on Higher Education, (3624 Market Street, Philadelphia, PA 19104, 267-284-5000), the Council of Standards for

Human Services Education (CSHSE), the Accreditation Commission for Programs in Hospitality Administration (ACPHA) and the National Association of Schools of Art and Design (NASAD). In addition, programs are accredited by the Commission on Dental Accreditation of the American Dental Association (ADA), Commission of the American Bar Association's Standing Committee on Legal Assistants (ABA), Joint Review Committee on Education in Radiologic Technology (JRCERT), the Accreditation Commission for Education in Nursing (ACEN), the Engineering Technology Accreditation Commission of the Accreditation Board for Engineering Technology (ETAC/ABET), the Commission on Opticianry Accreditation and the Association for Advancing Quality in Educator Preparation (AAQEP).

1.4 Academic Catalog

The Academic Catalog has information about policy, procedures, academics, administration, faculty, staff, and advisory commissions. It can be found [here](#).

1.5 College's Student Handbook

The [Student Handbook](#) is a student-friendly guide to City Tech. It is designed as a supplement to your [Academic Catalog](#) to answer questions about the College and the places to go when you need help. Keep the Student Handbook with you as a guide as you pursue your studies and degrees. It's a resource that you will appreciate throughout your City Tech career. Refer to the Academic Catalog or visit each office's webpage for additional information. The handbook is divided into the following sections:

- Services
- Financial Aid Facts
- Tuition and Fees
- Online @ City Tech
- Grades
- Frequently Asked Questions
- Academic Honors and Special Academic Programs
- Off-Campus Resources
- Rules, Regulations, Policies and Procedures
- Glossary
- Index

1.6 Department of 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 [Department of Mathematics](#) offers a full range of courses, from non-credit classes for students whose mathematics preparation is insufficient for credit-level work to those designed for students in all degree programs at the college. The mathematics department also offers three degree programs, an associate degree program (AS) in [Computer Science](#), a baccalaureate degree program (BS) in [Applied Mathematics](#) and a baccalaureate degree program (BS) in [Mathematics Education](#).

The computer science associate degree program provides students with the first two years of study leading to a baccalaureate degree in computer science, computer information science, computer systems technology, computer engineering technology or applied mathematics. Computer science is an excellent field of study for those seeking career opportunities in the worlds of business, education, government and industry.

The applied mathematics baccalaureate degree program is a practical degree for students with an interest in mathematics. In the 21st century information is a resource. Our Applied Mathematics majors learn to process data and create valuable information. An applied mathematics degree is quite versatile. Our majors learn techniques for analyzing big data, such as from social media and finance, and small data, such as from a clinical trial for a new medication. Our program consists of a math core, free electives and two internships. These internships are crucial for employment after graduation.

The mathematics education baccalaureate degree program is designed for students who wish to teach mathematics in middle school or high school. The program provides students with a strong mathematics background as well as the education courses that are required for teaching certification.

Employers value computer science and mathematics graduates, not just for their specific technical skills, but for the broad analytic and problem-solving abilities that are developed in the study of these subjects. Both computer science and mathematics programs feature internship opportunities, where students can earn credits while working for an actual real world employer. There are also opportunities to work with faculty on research projects, attend seminars, present at conferences, and engage in social activities with other students with similar interests through the student run math club. Special scholarship programs are available for qualified students, sponsored by the National Science Foundation and other organizations.

1.7 Mathematics and Mathematics Education Faculty

The Department of Mathematics consists of 42 full-time faculty members:

1. Henry Africk, Professor
2. Nadia Benakli, Professor
3. Corina Calinescu, Associate Professor
4. Holly Carley, Professor
5. Zhao Chen, Associate Professor
6. William Colucci, Lecturer
7. Dominick Desantis, Assistant Professor
8. Andrew Douglas, Professor
9. Samar ElHitti, Associate Professor
10. Laura Ghezzi, Professor
11. Urmi Ghosh-Dastiday, Professor
12. Joel Greenstein, Assistant Professor
13. Ezra Halleck, Assistant Professor
14. Sandie Han, Professor
15. Earl Hill, Professor
16. Brad Isaacson, Associate Professor
17. Thomas Johnstone, Associate Professor
18. Bruce Kan, Lecturer
19. Neil Katz, Professor
20. Nadia Stoyanova Kennedy, Associate Professor and Director of the Mathematics Education Program
21. Caner Koca, Associate Professor
22. Boyan Kostadinov, Associate Professor
23. Nan Li, Associate Professor

24. Ariane Masuda, Professor and Director of the Mathematics Education Clinical Experiences
25. Jonathan Natov, Professor and Chair of the Department of Mathematics
26. F. Patricia Medina, Assistant Professor
27. Grazyna Niezgoda, Lecturer
28. Kenneth Parker, Associate Professor
29. Katherine Poirier, Associate Professor
30. Jonas Reitz, Professor
31. Estela M. Rojas, Professor
32. Alexander Rozenblyum, Associate Professor
33. Hans Schoutens, Professor
34. Satyanand Singh, Professor
35. Arnavaz Taraporevala, Professor
36. Johann Thiel, Associate Professor
37. Thomas Tradler, Professor
38. Andrew Vaughn, Lecturer
39. Xiaohua Wang, Lecturer Doctoral Schedule
40. Huseyin Yuce, Professor
41. Suhua Zeng, Lecturer
42. Lin Zhou, Professor

1.8 Academic Integrity

New York City College of Technology Policy on Academic Integrity states the following.

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. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy on Academic Integrity may be found in the catalog.

Chapter 2

City Tech Education Programs

2.1 Vision, Mission, and Goals of the Educator Preparation Programs (EPP)

The vision of our Educator Preparation Programs Unit (EPP) is to be a high-quality teacher education provider, which, through teaching, research and collaboration, helps our teacher candidates grow professionally and become effective teachers. Our EPP's vision is formed through collaboration across disciplines, conversations among colleagues with diverse academic perspectives, in consultation with out-of-school partners, alumni and candidates, and various other professionals with expertise and experience. It synthesizes the shared set of ideas and values that guide our work in teacher education, and that outlines the goals that inform our practices.

Our mission is to prepare teachers, who can work effectively to transform educational opportunities for the students of New York City and beyond. To realize this mission, we outline four objectives:

1. Provide a high quality, discipline-based professional education for our undergraduate candidates.
2. Integrate theory and research with field experience to create conditions for the candidates to combine theory and practice.
3. Integrate diversity into academic and clinical experiences to deepen and enhance the educational experience of all students.
4. Build collaborations within the College, the University, and with New York city schools and local communities.

We further outline ten more concrete objectives, stated in terms of the competencies that we seek to develop among our teacher candidates. These competencies are closely aligned with the Model Core Teaching Standards of the Interstate Teacher Assessment Support Consortium (InTASC) (Council of Chief State School Officers, 2013), and are as follows:

1. Understand how learners grow and develop, recognizing that patterns of learning and development vary individually within and across cognitive, linguistic, social, emotional, and physical dimensions, and be able to design and implement developmentally appropriate and challenging learning experiences.
2. Understand the dynamics of individual differences and diverse cultures and communities, in order to ensure inclusive learning environments that enable each learner to meet high standards.
3. Work with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. Understand the central concepts, tools of inquiry, and structures of the discipline(s) one teaches and create learning experiences that make these aspects of the discipline accessible and meaningful for learners, and to assure growing mastery of the content.
5. Understand how to connect concepts and to use differing perspectives in order to engage learners in critical and creative thinking and collaborative problem solving related to authentic local and global issues.
6. Understand and use multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision-making.
7. Plan instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas and varieties of curricula, cross-disciplinary pedagogical skills, and knowledge of learners and the community context.
8. Understand and utilize a variety of instructional strategies that encourage learners to develop deep understanding of content areas and their connections, and that build skills which apply knowledge in meaningful ways.
9. Engage in ongoing professional learning, and ongoing use of evidence to continually evaluate one's practice, particularly the effects of one's pedagogical choices and actions on others (learners, families, other professionals, and the learning community), and to adapt one's practice to meet the needs of each learner.
10. Seek appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals and community members to ensure learner growth and to advance the profession.

2.2 Shared Values and Beliefs for Educator Preparation

Our purpose is to bring together the diverse goals and visions of a unified teacher education programs on our campus, which are parts of different academic departments, and to fuse them into a coherent unit with common principles, goals, outcomes, and assessments. The EPP promotes cross-disciplinary discourse, and collaborations that bring faculty and teacher candidates together for joint exploration of shared concerns, goals and diverse disciplinary and pedagogical perspectives, in order to create opportunities for ongoing learning of both faculty and their teacher candidates, and for the emergence and implementation of better teacher education models.

We understand the following dimensions of our work to be of utmost importance:

Professional Excellence

We emphasize our commitment to helping teacher candidates to develop the knowledge, skills and dispositions essential for a successful career as an educator. These skills include, but are not limited to, mastery of content knowledge and pedagogical theory, effective design and delivery of instruction, formal and informal assessment, approaches for motivating learners, leadership skills, classroom management strategies, and the ability to create learning environment to engage all students in productive learning. Additionally, we recognize the enormous potential of modern computer technologies as a tool for teaching, research, and productive communications with students and colleagues, and we are committed to nurturing our teacher candidates' growth in mastering this essential tool in their teaching, service, and professional development.

Communities

We are committed to the value of our teacher candidates developing collaborative relationships with peers, and teacher mentors, and in being part of formal and informal learning communities. Collaborative knowledge building is an approach that capitalizes on the diversity and richness of our exceptionally diverse college and communities located in Brooklyn, and fosters awareness of multiple perspectives, sensitivity to context, self-reflection, and dispositions for participating in group communication and for facilitating rich and complex discussions. Such an approach supports our teacher candidates in recognizing that students construct knowledge in multiple individual ways, influenced by factors such as ability, ethnicity, the social environment of home and school, primary language, and gender. It also helps candidates to recognize their individual students' differences, the multiple possibilities of adapting their instruction to individual student needs and how to do so in a variety of diverse communities and classroom settings.

Diversity

We share the vision that diversity extends beyond race, culture and gender. Therefore, we share the belief that sensitivity to, and knowledge about one's own and others' racial,

ethnic, religious, class, sexual, gender, and cultural and linguistic differences is essential to the work of transforming urban schools. Recognizing, understanding, and valuing diversity of learning styles, intelligences, ideas and talents, as well as social, economic, and cultural experiences are preconditions for teacher candidates that can enable them to create a learning environment in which all students, regardless of their race, color, religion, gender or sexual orientation, linguistic ability, ethnic or geographical origin, feel secure and appreciated. We share the desire to develop teacher candidates that enact “responsive pedagogy,” and who respond sensitively to the diversity of learners by offering varied learning opportunities that promote problem solving and the development of skills of each learner.

The pathways to pursue our mission and accomplish our goals are: Inquiry, Collaboration, and Reflection.

Inquiry

Inquiry refers both to the process of seeking knowledge and new understanding as well as to a method of teaching. Inquiry has several aspects, including inquiry as it is related to the body of content or body of research related to a specific field; and as a vehicle for a community of learners to examine pedagogical, institutional, or assessment practices (collaborative philosophical inquiry) or necessary teacher’s skills and dispositions, thus providing a process for implementation of systemic change for the greater good. A third aspect is learning to lead inquiry in a community of inquiry—to become a co-inquirer with students and an effective facilitator of productive discussions with students. We recognize that researching, questioning, reasoning, analyzing and problem solving are all aspects of an inquiry stance toward teaching and learning that we want to demonstrate in our teacher preparation courses, and one that we want to nurture in our teacher candidates.

Collaboration

Collaboration is the context in which all our inquiries take place. It is also a major venue for bringing teacher candidates, faculty, and school partners all together or in small groups to discuss issues of importance to teacher education and to learn from each other. Our intent is to help our teacher candidates learn to build collaborative partnerships with colleagues, parents, and students, and to help them learn and grow as individuals and as part of their own communities.

Reflection

Reflective practice is integrated into all aspects of our teacher education program, whether in the form of collaborative discussion, observation and thoughtful reflection on one’s or someone else’s performance, or in the form of reflective writing. Reflection is a major vehicle for gaining awareness of the complexities of one’s own teaching performance, for understanding one’s students in relation to content and curriculum, or for analyzing

teachers' decision-making. Our ambition is to harness reflection for systematic examination and improvement, whether through journaling and discussion, or in the form of individual or mentor-guided reflection, through the use of videotapes and other performance artifacts.

2.3 Teacher Education Programs

The Educator Preparation Programs unit at City Tech comprises three (3) baccalaureate teacher education programs and one certificate program:

- Mathematics Education (ME),
- Career and Technical Teacher Education (CTE),
- Technology Teacher Education (TE),
- Transitional C certificate program in Technology Education.

Educator preparation programs are housed in two Schools at the college. The Mathematics Education (ME) program is housed by the Department of Mathematics within the School of Arts and Sciences, whereas the Career and Technical Teacher Education (CTE) Program, Technology Teacher Education (TE), and the Transitional C Certificate programs are housed in the Department of Career and Technology Teacher Education (CTTE) Department within the School of Professional Studies. Teacher candidates from all teacher education programs take all of their general education courses through the School of Arts and Sciences. The content mathematics and mathematics education (MAT and MEDU) courses for the mathematics education teacher candidates are offered through the Department of Mathematics, and the specialized content and pedagogy (EDU) courses for the Career and Technical Teacher Education (CTE) and Technology Teacher Education (TE) teacher candidates are offered through the Department of Career and Technology Teacher Education (CTTE). There is a core of three general pedagogy courses (EDU 3610: Human Learning and Instruction, EDU 2455: methods and Materials for Special Needs Students, EDU 3670: Methods of Literacy Instruction) that are required courses for teacher candidates from all three programs. The content and syllabi of the latter three courses are developed by the faculty from both departments.

Partnerships with Schools

Our teacher education programs have strong partnerships with local P-12 schools. City Tech, which is in downtown Brooklyn, partners with local schools, most of which are rated as high-needs schools. Most of the schools accommodating our students' placements are in the borough of Brooklyn, where the most recently available data for 2018-19 indicates that 17.3% of students are white, 18.6% have disabilities, 12.8% are English-language learners, and 76.6% are at poverty level (NYSED, 2022). In District 13, where most of our placements

are located, data indicate that in the 2016-2017 academic year, 45.5% of students were black, 16.5% Hispanic, and 13.7% of students have disabilities. A school like the International High School in Prospect Heights, Brooklyn, where we continue to place our students, has 88% English-second-language learners. Some of our partner schools are Stuyvesant High School, Brooklyn Technical High School, In-Tech Academy, Midwood High School, City-Poly, Science Skills High School, Brooklyn Cooperative School, Parkside Middle School.

Chapter 3

City Tech Mathematics Education Program

The Mathematics Education program at City Tech is unique. The program is run by the Department of Mathematics. We offer rigorous mathematics content and pedagogical preparation. Our graduates become mathematics teachers, coaches, and team leaders in Brooklyn schools and schools and learning centers around New York City.

3.1 Program Aims

The aim of our Mathematics Education program is to prepare candidates who:

1. Understand how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. Understand the individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. Work with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. Understand the central concepts, tools of inquiry, and structures of the discipline(s) s/he teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. Understand how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

6. Understand and use multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
7. Plan instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills and pedagogy as well as knowledge of learners and the community context.
8. Understand and use a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections and to build skills to apply knowledge in meaningful ways.
9. Engage in ongoing professional learning and use evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the learning community), and adapt practice to meet the needs of each learner.
10. Seek appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth and to advance the profession.

3.2 Learning Outcomes for Mathematics Education Majors

Mathematics education graduates will be able to:

- Demonstrate subject matter knowledge. (**Content Knowledge**)
- Promote the learning and growth of all students by providing high quality and coherent instruction, designing and administering authentic and meaningful student assessments, analyzing student performance and growth data, using this data to improve instruction, providing students with constructive feedback on an on-going basis, and continuously refining learning objectives. (**Curriculum, Planning, and Assessment**)
- Promote the learning and growth of all students through instructional practices that establish high expectations, create a safe and effective classroom environment, and promote mutual respect. (**Teaching All Students**)
- Demonstrate professional behavior, seek and incorporate feedback from instructors and school mentors, collaborate with peers and school partners, and is engaged in continuous learning. (**Professional Culture and Responsibilities**)

Chapter 4

Degree Requirements

4.1 Admission Requirements

Students applying for admission must satisfy the College requirements for admission into a baccalaureate program and must be eligible to enroll in MAT 1475. All candidates must apply, write an essay and be interviewed by program faculty. The application form can be found here: [Math Education Application](#). Prospective transfer students must have a minimum cumulative GPA of 3.0¹ and have completed prerequisites for MAT 1475 or higher. They should consult with the Mathematics Department at the earliest possible point to be certain that they gain maximum transfer credit and that they enter the program with the requisite background. All students should be aware that the program requires a high level of math proficiency and that if they don't meet the entry program requirements unprepared for the rigorous coursework they may need to successfully complete additional course work and prerequisites before they are able to enter the program and begin upper-level coursework in mathematics. This may add to the credits required for graduation.

4.2 Degree Progression and Graduation Requirements

- Teacher candidates must receive a grade of C or higher in each EDU, MAT or MEDU course taken in the major.
- Mathematics Education courses completed with a grade below C or Fail, for MEDU 4001 and 4002, can be only repeated once.
- Students must have a minimum Grade Point Average (GPA) of 2.7 to graduate.
- Teacher candidates' progress through the program is also assessed via a number of other instruments, including Pre-CPAST, CPAST and Teacher Candidates Work Sam-

¹At the discretion of the program director or department chair, a student with a GPA lower than 3.0 may be admitted into the program.

ple Form. Teacher candidates must perform successfully on all of these assessments in order to advance and graduate from the program.

- Teacher candidates must complete a DASA (Dignity For All Students Act) workshop before graduation
- Teacher candidates must satisfy a foreign language requirement. The foreign language requirement may be met in any one of the following ways:
 - Successful completion of a 3-credit foreign language course at City Tech or transferred from another college.
 - Earning a score of 85 or higher on the New York State Regents examination in a foreign language.
 - A score of 4 or better on the advanced placement examination in a foreign language.
 - Satisfactory completion of a College Level Examination Program (CLEP) test in a foreign language.
 - Graduation from a higher education institution with a bachelor's degree or its equivalent, in which the language of instruction was other than English.
- 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.

4.2.1 Academic Standing and Probation

To remain in good academic standing in the program, teacher candidates must maintain a minimum GPA of 2.7 and receive at least a grade C in each EDU, MAT or MEDU required course. In the event that these conditions are not met, the teacher candidate will be placed on academic probation and, at the discretion of the program director, may or may not be permitted to register for the next content mathematics or mathematics education course until the GPA is raised to 2.7 or until a satisfactory grade is earned in the required course.

Teacher candidates placed on probation will be dismissed from the program if they are unable to satisfy the GPA and grade requirements after two successive semesters on probation. At the discretion of the program director, the candidate could be allowed a third semester on probation if satisfactory academic progress is being made.

Teacher candidates dismissed from the program for unsatisfactory academic progress cannot apply for reinstatement for at least one full semester (excluding summer session). Reapplications must provide evidence that the student is capable of performing at the level required to complete the degree.

4.2.2 Progression to Student Teaching

To qualify for student teaching, teacher candidate must:

- Have completed all required courses.
- Have taken CST and EAS certification exams.
- Submit a student teaching application along with copies of CST and EAS exam results, and be interviewed and approved by the program director.
- At the discretion of the program director, teacher candidates who have not met the above requirements may be allowed to progress to student teaching if they agree to take specific steps to remedy deficiencies.

4.3 Required Courses

Table 4.1 contains the General Education Flexible Common Core and College Option Requirements (42 to 46 credits). Table 4.2 contains Program-Specific Degree Requirements (84 credits). Table 4.3 is for free elective courses (take as needed to equal 120 credits).

In Table 4.2, at least two courses designated WI (writing intensive) are required from the program-specific required and elective courses. A list of WI courses offered in Spring 2023 can be found [here](#). Double Duty Specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category. Students who do not take advantage of Double Duty may require up to 126 credits to graduate.

In meeting their general education requirements overall, students must take at least one advanced liberal arts course or choose two sequential courses in one of the world language (WL) course offerings, such as Arabic (ARB), Spanish (SPA), Chinese (CHN), or French (FREN). Choosing to take advantage of double duty can speed up progress toward graduation and increase elective credits. Consult with an advisor about your options. Foreign Language also satisfies WCGI.

Recommended electives include advanced math, applied math or computer systems technology courses. Please consult with the program coordinator when choosing your electives. See also Section 4.4.

²Two courses designated WI are required from the College Option or GenEd Flexible Common Core.

³Students must take at least one advanced liberal arts course or choose two sequential courses in a foreign language.

⁴Double Duty Specific courses listed indicate double duty courses, i.e., program degree requirements that also meet general education requirements in that category.

Course	Course Title	Number of credits
ENG 1101	English Composition I (EC)	3
ENG 1121	English Composition II (EC)	3
MQR	Mathematical and Quantitative Reasoning (Recommended MAT 1275 or higher)	3 to 4
LPS	Life and Physical Sciences (BIO/ CHEM/ PHYS 1***)	3 to 5
WCGI	World Cultures and Global Issues ² (a World Language course is required)	3
USED	US Experience in Its Diversity ²	3
IS	Individual and Society ² (Recommended PSY 1101)	3
CE	Creative Expression ²	3
SW	Scientific World ² (Recommended MAT 1375 or higher)	3 to 4
Add. Flex Core	Additional Flexible Common Core Course ² (Recommended MAT 2580)	3
COM 1330	Public Speaking	3
ID	Interdisciplinary Course ² (Recommended Sociology of Education)	3
LibArt	Liberal Arts Elective ²	3
LibArt	Liberal Arts Elective ²³	3

Table 4.1: General Education Flexible Common Core and College Option Requirements – 42 to 46 credits.

Course	Course Title	Number of credits
WL	World Language Sequence (WCGI) ⁴	3
MAT 1372	Statistics with Probability (SW) ⁴	3
MAT 1475	Calculus I (MQR, SW) ⁴	4
MAT 1575	Calculus II (MQR, SW) ⁴	4
MAT 2571	Introduction to Proofs	4
MAT 2580	Introduction to Linear Algebra	3
MAT 2675	Calculus III	4
MAT 3050	Geometry	4
MAT 3075	Introduction to Real Analysis	4
MAT 3080	Modern Algebra	4
MAT 4030	History of Mathematics	3
MEDU 1010	Foundations of Mathematics Education (WI)	3
MEDU 1021	Teaching and Learning Strategies for Mathematics Teachers (WI)	3
MEDU 2901	Peer Leader Training in Mathematics	1
MEDU 3000	Mathematics of the Secondary School Curriculum	4
MEDU 3001	Methods of Teaching Middle School Mathematics	3
MEDU 3002	Methods of Teaching Secondary School Mathematics	3
MEDU 3003	Microteaching	3
MEDU 4000	Student Teaching Seminar	4
MEDU 4001	Student Teaching in the Middle School	4
MEDU 4002	Student Teaching in the High School	4
EDU 2455	Methods and Materials for Special Needs Students (WI)	3
EDU 3610	Human Learning and Instruction	3
EDU 3670	Methods of Literacy Instruction in Teacher Education (WI)	3

Table 4.2: Program-Specific Degree Requirements – 84 credits.

Course	Course Title	Number of credits
XXX xxxx	Free elective	3
XXX xxxx	Free elective	3

Table 4.3: Free elective courses. Take as needed to equal 120 credits.

4.4 Certificate in Teaching Computer Science

Students are encouraged to take 12 computer science credits so that they can be eligible to apply for a certificate in teaching computer science. See Table 4.4 for a list of recommended Computer Science courses.

Course	Course Title	Number of credits
MAT 1630	Introduction to Computational Science	3
MAT 2440	Discrete Structures and Algorithms I	3
MAT 2540	Discrete Structures and Algorithms II	3
CST 1101	Problem Solving with Computer Programming	3
CST 2403	Introductory C++ Programming Language Part I	3

Table 4.4: Recommended Computer Science Courses.

4.5 Course Descriptions

1. General Education Flexible Common Core and College Option Requirements (see Table 4.1)

- **ENG 1101 – English Composition I**

Pathways: English Composition

4 cl hrs

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.

Pre-requisite: CUNY proficiency in English.

- **ENG 1121 – English Composition II**

Pathways: English Composition

3 cl hrs

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.

Pre-requisite: ENG 1101 or ENG 1101CO or ENG 1101ML.

- **MQR - Mathematical and Quantitative Reasoning**

For a searchable list of General Education courses, please visit the [Liberal Arts and Sciences course page](#).

- **LPS - Life and Physical Sciences**
For a searchable list of General Education courses, please visit the [Liberal Arts and Sciences course page](#).
- **WCGI - World Cultures and Global Issues**
For a searchable list of General Education courses, please visit the [Liberal Arts and Sciences course page](#).
- **USED - US Experience in its Diversity**
For a searchable list of General Education courses, please visit the [Liberal Arts and Sciences course page](#).
- **IS - Individual and Society**
For a searchable list of General Education courses, please visit the [Liberal Arts and Sciences course page](#).
- **CE - Creative Expression**
For a searchable list of General Education courses, please visit the [Liberal Arts and Sciences course page](#).
- **SW - Scientific World**
For a searchable list of General Education courses, please visit the [Liberal Arts and Sciences course page](#).
- **Add. Flex Core - Additional Flexible Common Core Course**
For a searchable list of General Education courses, please visit the [Liberal Arts and Sciences course page](#).
- **COM 1330 - Public Speaking**
Pathways: Individual and Society
3 cl hrs
Fundamental principles of speaking in public situations and the preparation and delivery of informative and persuasive presentations. Subjects include ethics in public speaking, audience analysis, selecting and researching speech topics, constructing well-reasoned arguments, extemporaneous delivery, and peer evaluation. Students are expected to develop outlines and speaking notes, use visual aids, and improve on verbal and nonverbal delivery skills. The minimum technological requirements for fully online sections of this course are a working camera and microphone. Students are expected to turn on cameras and microphones at their instructor's request.
Prerequisite: Eligibility for ENG 1101 or Co-requisite of ENG 1101CO or ENG 1101ML.
- **ID - Interdisciplinary Course**

- **LibArt - Liberal Arts Elective**

For a searchable list of General Education courses, please visit the [Liberal Arts and Sciences course page](#).

2. Program-specific degree requirements (see Table 4.2)

- **MAT 1372 - Statistics with Probability**

Pathways: Scientific World

2 cl hrs, 2 lab hrs

Topics include sample spaces and probabilities, discrete probability distributions (Binomial, Hypergeometric), expectation and variance, continuous probability distributions (Normal, Student, Chi-Square), confidence intervals, hypothesis testing, and correlation and regression. Spreadsheets are used throughout the semester.

Pre- or Co-requisite: MAT 1375.

- **MAT 1475 - Calculus I**

Pathways: Math and Quantitative Reasoning, Scientific World

4 cl hrs

Topics include functions, limits, differentiation, tangent lines, L'Hôpital's Rule, Fundamental Theorem of Calculus and applications.

Pre-requisite: MAT 1375 or math placement for MAT 1475.

- **MAT 1575 - Calculus II**

Pathways: Math and Quantitative Reasoning, Scientific World

4 cl hrs

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.

Pre-requisite: MAT 1475.

- **MAT 2571 - Introduction to Proofs**

4 cl hrs

Preparation for teaching an advanced mathematics curriculum with a focus on the processes of mathematical argumentation and reasoning, deduction, and discovery. Topics include propositional and first order logic, axiomatic approach to number theory, set theory and abstract properties of relations, with a particular emphasis on number theory.

Pre-or Co-requisite: MAT 1575.

Equivalent to old course number MAT 2070 or MAT 2071.

- **MAT 2580 - Introduction to Linear Algebra**

Pathways: Scientific World

3 cl hrs

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 Co-requisite: MAT 1575.

- **MAT 2675 - Calculus III**

4 cl hrs

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.

Pre- or Co-requisite: MAT 2580.

- **MAT 3050 - Geometry**

4 cl hrs

Euclidean and Hyperbolic geometry in two and three dimensions from an axiomatic point of view. An examination of classical theorems as well as groups of transformations.

Pre-requisite: MAT 2571.

- **MAT 3075 - Introduction to Real Analysis**

4 cl hrs

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.

Pre-requisite: MAT 1575, MAT 2071.

- **MAT 3080 - Modern Algebra**

4 cl hrs

An introductory course in abstract algebra covering groups, rings and fields. Includes connections between abstract algebra and secondary school algebra and geometry.

Pre-requisite: MAT 2571.

- **MAT 4030 - History of Mathematics**

3 cl hrs

Reviews the development of mathematical concepts from the origins of algebra and geometry in the ancient civilizations of Egypt and Mesopotamia through the demonstrative mathematics of ancient Greeks to the discovery of Calculus, non-Euclidian geometries and formal mathematics in 17th -20th century Europe.

Pre-requisite: MAT 2571.

- **MEDU 1010 - Foundations of Mathematics Education**

Writing Intensive

3 cl hrs

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.

Pre- or Co-requisite: ENG 1101 or ENG 1101CO or ENG 1101ML, and MAT 1375 or higher.

- **MEDU 1021 - Teaching and Learning Strategies for Mathematics Teachers**

Writing Intensive

2 cl hr, 2 lab hrs

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.

Pre-requisite: ENG 1101 or ENG 1101CO or ENG 1101ML, and MAT 1375 or higher.

Equivalent to old course number MEDU 1020.

- **MEDU 2901 - Peer Leader Training in Mathematics**

1 cl hr

Preparation for leading a group of students in mathematical problem solving by focusing on communication, questioning, group dynamics, motivation, student engagement and other process issues. Peer leaders spend 20 clock hours over the course of the semester working with an assigned group as peer leaders. Coursework requires maintaining reflective journals and an empirical research project related to peer-leading practice.

Prerequisite ENG 1101 or ENG 1101CO or ENG 1101ML, and MAT 1375 or higher.

- **MEDU 3000 - Mathematics of the Secondary School Curriculum**

4 cl hrs

An examination of secondary school mathematics curriculum from an advanced

perspective. Includes discussions of mathematical concept representations, student errors and the design of activities.

Pre-requisite: MAT 2571.

- **MEDU 3001 - Methods of Teaching Middle School Mathematics**

Writing Intensive

3 cl hrs

Curriculum development for grades 7-9, aligning with state and national standards and incorporating appropriate teaching and learning strategies and assessment techniques. Focus is placed 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 a total of 25 clock hours of observation of mathematics teaching and learning in middle schools.

Pre-requisite: MEDU 1010.

Pre- or Co-requisite: ENG 1121, MEDU 2011.

Equivalent to old course MEDU 3001.

- **MEDU 3002 - Methods of Teaching Secondary School Mathematics**

Writing Intensive

3 cl hrs

Curriculum development for grades 10-12, aligning with state and national standards and incorporating appropriate teaching and learning strategies and assessment techniques. Focus is placed 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 a total of 25 clock hours of observation of mathematics teaching and learning in high school.

Pre-requisite: MEDU 1010, MEDU 1021.

Equivalent to old course MEDU 3020.

- **MEDU 3003 - Microteaching**

3 cl hrs

Intermediate field school-based experience and preparation for lesson and unit planning, student assessment and delivery of instruction. Includes 3 hours of class work per week and 60 clock hours per semester of twice-weekly teacher-mentored, school-based, classroom experience: tutoring, grading and working with small groups of students, 20 hours of which are spent working with ELL (English language learners) and 20 with students with special needs.

Pre-requisite: MEDU 3001.

Pre- or Co-requisite: MEDU 3002.

- **MEDU 4000 - Student Teaching Seminar**

4 cl hrs

The seminar provides a discussion forum for students, guided by a faculty member, to address and resolve pedagogical issues faced during the concurrent field placement and to prepare their edTPA portfolio.

Pre-requisites: MEDU 3001, MEDU 3002, MEDU 3003 and department permission.

Pre- or Co-requisite: MEDU 4001 or MEDU 4002.

Equivalent to old course MEDU 4040.

- **MEDU 4001 - Student Teaching in the Middle School**

5 hrs/day for 7 weeks

This culminating field-based experience involves 35 consecutive days of supervised student teaching in a middle school in grades 7-9.

Pre-requisites: MEDU 3001, MEDU 3002, MEDU 3003 and department permission.

- **MEDU 4002 - Student Teaching in the High School**

5 hrs/day for 7 weeks

This culminating field-based experience involves 35 consecutive days of supervised student teaching in a high school in grades 10-12.

Pre-requisites: MEDU 3001, MEDU 3002, MEDU 3003 and department permission.

- **EDU 2455 - Methods and Materials for Special Needs Students**

Writing Intensive

3 cl hrs

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.

Pre-requisite: None (open to education majors only).

- **EDU 3610 - Human Learning and Instruction**

/PSY 3502

3 cl hrs

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.

Pre-requisites: PSY 1101, ENG 1101.

- **EDU 3670 - Methods of Literacy Instruction in Teacher Education**

Writing Intensive

3 cl hrs

This course prepares teacher candidates for literacy instruction in career and technology and mathematics content areas. Emphasis is on designing and adapting content materials and assessments to help students develop literacy skills and learning strategies.

Pre-requisites: ENG 1121, EDU 2362 or MEDU 1021, EDU 2610.

3. Recommended Computer Science Courses (see Table 4.4)

- **MAT 1630 - Introduction to Computational Science**

2 cl hr, 2 lab hrs

A project-based introduction to computational thinking and problem solving. Covers a wide range of topics, including data visualization, statistical techniques, simulations of dynamical systems, computational techniques to understand data, using regression to fit models to data, as well as an introduction to some more advanced topics: Monte Carlo simulations, optimization, dynamic programming, image processing, natural language processing, geospatial data analysis and current data science.

Pre- or Co-requisite: MAT 1475.

- **MAT 2440 - Discrete Structures and Algorithms I**

Pathways: Scientific World

Writing Intensive

2 cl hr, 2 lab hrs

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.

Pre-requisites: (MAT 1375 or higher) and (CST 1201 or CST 2403 or MAT 1630).

- **MAT 2540 - Discrete Structures and Algorithms II**

Pathways: Scientific World

Writing Intensive

2 cl hr, 2 lab hrs

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.

Pre-requisite: MAT 2440.

- **CST 1101 - Problem Solving with Computer Programming**

2 cl hr, 2 lab hrs

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.

Pre-requisite: None.

- **CST 2403 - Introductory C++ Programming Language Part I**

2 cl hr, 2 lab hrs

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.

Pre-requisites: (CST 1101 and (MAT 1275 or higher)) or MAT 1476 or (EMT 1111 and (MAT 1275 or higher)).

4.6 Sample Course of Study

- **Semester 1 - Total: 13 to 15 credits**

ENG 1101	English Composition I	3
LPS	Life and Physical Sciences	3 to 5
MAT 1475	Calculus I (MQR)	4
USED	US Experience in Its Diversity	3

- **Semester 2 - Total: 16 credits**

ENG 1121	English Composition II	3
MAT 1575	Calculus II	4
MAT 2580	Introduction to Linear Algebra	3
PSY	Introduction to Psychology	3
WCGI	World Cultures and Global Issues	3
	(a World Language course is required)(FL)	

- **Semester 3 - Total: 17 credits**

MAT 2675	Calculus III	4
MAT 2571	Introduction to Proofs	4
MEDU 1010	Foundations of Mathematics Education	3
COM 1330	Public Speaking	3
CE	Creative Expression	3

- **Semester 4 - Total: 15 credits**

MAT 1372	Statistics with Probability	3
MAT 3075	Introduction to Real Analysis	4
MAT 3080	Modern Algebra	4
MEDU 1021	Teaching and Learning Strategies for Mathematics Teachers	3
MEDU 2901	Peer Leader Training in Mathematics	1

- **Semester 5 - Total: 17 credits**

MAT 3050	Geometry	4
MEDU 3000	Mathematics of the Secondary School Curriculum	4
MEDU 3001	Methods of Teaching Middle School Mathematics	3
EDU 3610	Human Learning and Instruction	3
Add. Flex Core	Additional Flexible Common Core Course	3

- **Semester 6 - Total: 16 credits**

MEDU 3002	Methods of Teaching Secondary School Mathematics	3
EDU 2455	Methods and Materials for Special Needs Students	3
LibArt	Liberal Arts Elective	3
LibArt	Liberal Arts Elective	3
XXX xxxx	Free Elective	3

- **Semester 7 - Total: 15 credits**

MAT 4030	History of Mathematics	3
MEDU 3003	Microteaching	3
EDU 3670	Methods of Literacy Instruction in Teacher Education	3
ID	Interdisciplinary Course	3
XXX xxxx	Free Elective	3

- **Semester 8 - Total: 12 credits**

MEDU 4000	Student Teaching Seminar	4
MEDU 4001	Student Teaching in the Middle School	4
MEDU 4002	Student Teaching in the High School	4

4.7 Advisement

Each semester students are assigned an advisor who will help them on the course selection for the following semester. It is very important that students follow us with an advisor on the course planning so that they can graduate in a timely manner. The advisement plan sheet we use can be found in Appendix A.

4.8 ePermit

The following information can be also found at the following [website](#).

4.8.1 Taking Courses at CUNY Colleges

City Tech students who wish to take a course at a CUNY College other than their HOME College will need to file for an ePermit using CUNYfirst.

To be eligible to file for a Permit, you:

- Must not be on Academic Probation.
- Must be matriculated and currently in attendance.
- Must not be a newly admitted student (freshmen/transfer).
- Must not have any holds on academic record.
- Must have all immunizations completed. Newly admitted ROTC and CUNY BA students are eligible with advisor approval.

City Tech does not approve incoming e-permits requests for all 1000/2000 level BIO/CHEM/PHYS courses, or courses that fulfill our Interdisciplinary college option requirement. Upper level e-permit requests for 3000 BIO/CHEM/PHYS courses are subject to departmental approval and seat availability.

4.8.2 Non-CUNY Permit - Taking Courses at Accredited Institutions outside of CUNY

The Non-CUNY Permit Form requires approval/signature of a financial aid counselor or staff member. A Consortium Agreement must be completed in order to receive financial aid for classes taken at non-CUNY institutions.

4.8.3 Student Rights and Responsibilities on Permits

Permit course: Each permit request is for a single course and its equivalent. Thus, a student needs to complete a permit required for each equivalent course

Course grade: Courses will be transferred to the HOME College and recorded with the grade assigned by the HOST College which will be included in the combined GPA. The number of credits transferred for each course will be the value assigned by the HOST College and not the HOME College. (e.g., MAT 1375 is 4 credits at HOME College, an equivalent course taken on permit is 3 credits at the HOST College; upon transfer the student is awarded 3 credits on their HOME College transcript with the HOST College's name duly noted.)

Course cancellation: If a student enrolls in a course at the selected HOST College and decides not to attend the course, it is the student's responsibility to cancel the course registration at both the HOME and HOST campuses as well as the ePermit request. The student must notify his/her HOME College of the cancellation before classes begin to avoid a tuition liability and to prevent any academic consequences. ePermit course cancellation adheres to the CUNY refund policy dates and deadlines published in the academic calendar. Notifying the Home College can be done by sending an email to ePermit@citytech.cuny.edu.

Financial Aid: It is the student's responsibility to make certain that his/her total credits meet financial aid eligibility and credit load requirements. Students should meet with an academic advisor at their HOME College with any course related questions. Questions concerning financial aid can be addressed by a financial aid counselor at the HOME College.

Tuition: Tuition is charged and paid at a student's HOME College. Students eligible for financial aid are to apply through their HOME College and are responsible for meeting any credit load requirements. Tuition is calculated based on the HOST College credits. Courses for which material fees are applied are paid by the student to the HOST College.

4.9 Applying for Graduation

Meet with an advisor and review your Degree Audit to ensure you are on track to graduate. Once you've met the following degree requirements, you're ready to graduate:

- ✓ 120+ credits for Bachelor degree
- ✓ GPA of 2.7 or better
- ✓ Completion of Credits in Residency

- ✓ Completion of Writing Intensive Requirement
- ✓ Completion of Overall Liberal Arts and Science Credits
- ✓ Completion of General Education requirements (Pathways)
- ✓ Completion of Major Requirements
- ✓ Completion of Required Clinical Practice

Then follow the instructions on the following [website](#).

Chapter 5

Undergraduate Research and Funding Opportunities

The goal of City Tech’s undergraduate research program is to ensure that all students have access to undergraduate research opportunities. We are committed to the principle that research is a learning experience leading to deeper understanding of concepts taught in the classroom, through their application to discover new knowledge or solve societal problems. We strive to support:

- Undergraduates by connecting them with faculty mentors, providing professional development and opportunities to show case and celebrate their work.
- Faculty mentors by advertising their research interests, providing mentorship on mentoring, fund raising in order to provide additional resources, guidance on incorporation of research into the curriculum, and recognition of their contributions.

5.1 CUNY Research Scholars Program

The CUNY Research Scholars Program provides funded laboratory experiences for associate degree students (or baccalaureate students with less than 50 credits completed) over a one-year period. The goal of the program is to encourage undergraduate students to participate in authentic research and to increase persistence in STEM disciplines. For more information, check the following [website](#).

5.2 Emerging Scholars Program

The Emerging Scholars Program provides students with an opportunity to apply what was learned in the classroom to discover new knowledge, solve real-world problems and develop professionally while working with faculty to advance their scholarly endeavors. The program includes specially designed workshops for students offered by the Undergraduate Research Committee, preparation of an abstract and participation in the Honors/Emerging Scholars

poster session. Participating students must complete online training through Collaborative Institutional Training Initiative (CITI) within the first six weeks. The Emerging Scholars Program provides a \$500 stipend for full-time students (enrolled for 12 or more credits) and a \$250 stipend for part-time students (enrolled in 11 or fewer credits) for conducting research with a faculty member. Some funding for student travel to professional conferences to present results is available. For more information, check the following [website](#).

5.3 Honors Scholars Program

The program focus on serving the needs and recognizing the accomplishments of highly motivated and academically accomplished students. The most accomplished students need greater challenges and they also merit special recognition. We provide students with the opportunity to join the Honors Scholars Program and to be nominated for the National Society of Collegiate Scholars (NSCS). This program is open for any student who completed at least 12 credits and has a minimum GPA of 3.4 or higher. For more information, check the following [website](#).

5.4 LSAMP Scholarship

The Louis Stokes Alliances for Minority Participation (LSAMP) program is an alliance of 12 CUNY campuses, funded by the National Science Foundation. The 2-year LSAMP program provides supports for freshman (30 Apprentices) and sophomore (10 Fellows) students at City Tech to conduct research. The goals are to support highly motivated students in science, technology, engineering and math (STEM) majors through research training, academic support, development of innovative pedagogies, so that they are prepared for the rewarding careers and/or graduate school. For more information, check the following [website](#).

5.5 Noyce Scholarship

The overarching goal of the Noyce program is to increase the number of highly qualified STEM teachers in high need school districts in Brooklyn and the New York metropolitan area. Students at City Tech and BMCC participate in teaching internships at local middle schools and high schools in NYC and/or with Professors. Scholarships are also available and students participate in a STEM summer program. For additional information, please contact Professor Fangyang Shen, Computer Systems, at fangyang.shen92citytech.cuny.edu.

5.6 NYC Men Teach

The CUNY NYC Men Teach program provides academic and financial supports to program participants, with the goal of supporting them through the teachers certification and hiring process so they can enter the NYC teaching workforce as effective urban educators.

NYC Men Teach at City Tech is an active program that currently supports NYC Men Teach fellows from the two City Tech teacher degree programs—the Mathematics Education and the Career and Technical Teacher Education—as well as other students oriented towards a teaching career. Program fellows receive monthly metro cards, free certification exam vouchers and other financial incentives, as well as access to a dedicated program counselor who offer advisement and other academic supports. NYC Men Teach program fellows also convene for a semester-long seminar focused on culturally-responsive education. For more information, check the following [website](#).

5.7 Federal Work Study Award

The Federal Work-Study Program is a program that provides part-time jobs for undergraduate students with financial need, allowing them to earn money to help pay education expenses. Jobs are available both on and off-campus and include community service work.

The Federal Work-Study (FWS) program provides part-time jobs for students as part of their financial aid package determined by FAFSA. While most FWS jobs are performed for offices at a student’s college, students may now apply to external jobs outside of CUNY through the new FWS XSITE initiative. The Federal Work-Study Experimental program allows students who are pursuing degrees in the Medical field or Teacher’s Education to be compensated for all or a portion of their hours dedicated to clinical work or classroom student teaching hours while, satisfying their core curriculum requirements.

Students who wish to be considered for need based scholarships must file the current year’s Free Application for Federal Student Aid (FAFSA). For more information, check the following [website](#). Prof. Masuda is responsible for managing FWS timesheets.

Chapter 6

Clinical Practice

New York State requires that all teacher candidates complete at least 100 hours of supervised field experience prior to student teaching. At City Tech, this field experience is completed in conjunction with the pedagogy courses and is carried out in partner schools in New York City. Teacher candidates must enroll in field experience courses, which are co-requisites for the pedagogy/methods courses. These are credit-bearing courses. Fieldwork will engage teacher candidates in diverse settings that include:

- High need schools.
- Students with disabilities or special needs (at least 15 hours).
- English language learners.
- Teaching literacy in the content area.
- Both middle (7-9) and high school (10-12) students.

Teacher candidates are advised that some of their field experience hours must include a focus on understanding the needs of students with disabilities. Candidates are encouraged to observe integrated co-teaching (or inclusion) classes in their certification area and other special education classroom situations as available. Field experience hours should be noted on Field Experience Time Sheets. Teacher candidates should also aim to earn at least 20-40 field experience hours in high needs schools. The specific field experience assignments, and their coordination with the pedagogy courses, will vary. Teacher candidates will usually be required to complete written assignments for their pedagogy courses on the basis of their field experiences.

The field experience assignments may involve:

- Observations of instruction by sponsor teachers. These observations provide an opportunity to understand how pedagogical theories studied in the university actually work in the secondary classroom. They also provide an opportunity to gain experience with discipline-specific instructional strategies and classroom management issues.

- Assisting the sponsor teacher with instructional activities, tutoring students, and grading class assignments and tests.
- Journal entries and/or classroom-based research documenting and analyzing field experience. Since field experience must be completed in conjunction with an academic course, paid internships, summer camp work, and substitute teaching cannot be used to satisfy this requirement.
- Students should plan their class and work schedules carefully to ensure that they are able to complete the required experiences during school hours.

Prior to each placement, at the beginning of the semester, Profs. Kennedy and Masuda run an orientation session to discuss all the details and answer any questions.

6.1 Fingerprinting

All students need to be fingerprinted before they can start any clinical experiences. Prof. Masuda will register you in the PETS (Personnel Eligibility Tracking System) from the DOE so that you can receive a nomination letter and follow the steps therein to make an appointment to get fingerprinted. Students are responsible for paying the \$101.75 fee. Prof. Masuda will notify you when you receive the security clearance.

6.2 Initial Field Experience

Initial field experience includes 25 clock observation hours (30 observed periods) as part of MEDU 3001: Methods of Teaching Middle School Mathematics, and 25 clock observation hours (30 observed periods) as part of MEDU 3002: Methods of Teaching High School Mathematics.

The confidentiality agreement needs to be signed by the teacher candidate and school representative and returned to Prof. Masuda within the first week of your placement; see a copy in Appendix F. A sample of the introduction letter that is sent to the observer and to the principal/assistant principal of the school can be found in Appendix C.

6.3 Intermediate Field Experience

Intermediate field experience includes 20 clock hours of facilitating small-group work as part of MEDU 2901: Peer-leader Training in Mathematics, and 60 clock hours of 60 clock hours of intermediate school-based clinical experience, which involves shadowing teachers, tutoring students, grading exams, working with groups of students, and teaching lessons, as part of MEDU 3003: Microteaching.

The intermediate field school-based experience also includes preparation for lesson and unit planning, student assessment and delivery of instruction. It includes 60 clock hours

per semester of teacher-mentored, school-based, classroom experience, 20 hours of which are spent working with ELL (English language learners), and 20 with students with special needs.

The confidentiality agreement needs to be signed by you and school representative and returned to Prof. Masuda within the first week of your placement; see a copy in Appendix F. A sample of the introduction letter that is sent to the observer and to the principal/assistant principal of the school can be found in Appendix D.

6.4 Student Teaching

Student teaching has consists of 70 days (14 weeks), during which time each student teacher spends 7 weeks of full-time teaching in a middle school and 7 weeks of full-time teaching in a high school, mentored by expert cooperating teachers and a student teacher faculty supervisor. The student teachers take MEDU 4000: Student Teaching Seminar.

The confidentiality agreement needs to be signed by you and school representative and returned to Prof. Masuda within the first week of your placement; see a copy in Appendix F. A sample of the introduction letter that is sent to the observer and to the principal/assistant principal of the school can be found in Appendix D. A sample of the timesheet can be found in Appendix B.

6.5 General Guidelines for Field Experience in P-12 Classrooms

The student teacher is a representative of City Tech and a guest in the host school. The student teacher, entering a professional situation, is expected to display a professional manner and is responsible for developing a positive working relationship within the assigned school setting.

- Dress professionally. Choose attire that you would wear if you were a teacher. Avoid shorts, sandals, tank tops, etc. - these are too casual and may leave an adverse impression on the students and/or the classroom teacher and/or school administrators.
- Be prompt. Arrive at the classroom before class begins. Never disturb the teacher by walking in after class has begun.
- Thank the teacher for allowing you to be a guest and then ask them where to sit and what role they wish you to play in the class. Field experience will be more rewarding and productive if you play an active role in the classes you visit. Ask the teacher whether you should simply observe and take notes or whether you should interact with students by helping them in group work, with individual assignments, homework, etc. Volunteer wherever your contribution would be appropriate.

- Follow the teacher’s directions. If you are asked to perform tasks, such as making photocopies, going to the library or the computer lab, do it. All tasks related to teaching are potentially valuable.
- Be helpful, not intrusive. Only approach the teacher with your questions at times that do not interfere with the lesson or the teacher’s agenda. Teachers are busy people and have a great deal on their minds. Be sensitive to this.
- Finally, send a short note of thanks to the teachers and school administrators who have allowed you to be a visitor in their schools. This kind of basic politeness, or lack thereof, is often taken as an indication of character, and good character is an essential aspect of good teaching.

Confidentiality is an important component of being in the classroom. This includes maintaining privacy regarding children’s personal information, academic records, and class lists. Another important aspect is to maintain positive relationships with administrators, faculty, staff, students, and parents.

6.6 Teacher Candidate Assessment

6.6.1 Pre-CPAST

The Pre-CPAST assessment is used in the semesters before student teaching. It has four dimensions of assessment: 1) Pedagogy; 2) Instructional delivery; 3) Assessment; 4) Analysis of teaching; 5) Dispositions; 6) Professional relationships; and 7) Critical thinking and constructive criticism. It is used once at the end of the course in conference meeting with the teacher candidate and course instructor.

The teacher candidates are evaluated with the Pre-CPAST in three mathematics education courses leading to student teaching: MEDU 3001, MEDU 3002 and MEDU 3003. In the Pre-CPAST, a Level 0 represents performance that “does not meet expectations” in regards to program standards, Level 1 indicates that the teacher candidate is at the “emerging” stage in meeting program standards, and Level 3 represents performance that “meets expectations.” The Pre-CPAST form includes 14 items.

On the first Pre-CPAST assessment in the sequence of these three courses, all teacher candidates are expected to score at emerging (1) or above levels in at least ten categories, and at level “does not meet expectations” (0) on at most 4 categories of the rubric of this assessment.

On the second Pre-CPAST assessment in this sequence, teacher candidates are expected to score at emerging (1) or above levels in at least twelve categories, and “does not meet expectations” on at most 2 categories of the rubric of this assessment.

On the third Pre-CPAST assessment in this sequence, teacher candidates are expected to score at emerging (1) or above levels in all fourteen categories, and “does not meet

expectations” on 0 categories of the rubric of this assessment, and a minimum average score of 1.5

Candidates who fail to meet minimum requirements in any of these courses may be required to repeat the course or will be allowed to proceed to the next course pending the satisfactory completion of additional remedial work.

6.6.2 CCAST

The Candidate Preservice Assessment of Student Teaching (CCAST) is used during student teaching. It will be used twice during the course of the term and will be completed by the University Supervisor, Cooperating Teacher, and Student Teacher. Each member of the team (cooperating teacher, university supervisor, and student teacher)

- Completes the evaluation in week 5 or 6 (Mid-term) of the student teaching experience and in week 13 or 14 (Final).
- Brings the completed form to the mid-term and final 3-way conference.

At the Mid-term 3-way conference:

- Goals are set for the remainder of the student teaching experience.
- The University Supervisor records the consensus ratings and enters into the form by the end of week 7.

At the Final 3-way conference:

- Suggestions and comments are made to assist in the transition to teaching role.
- The University Supervisor records the consensus ratings and enters into the form by the end of week 15.

During the student teaching semester, teacher candidates have two full-time student teaching placements –one in a middle school (7 weeks) and another in a high school (7 weeks). At the end of each student teaching placement they are assessed using the CCAST form, where the performance levels are set as follows: (0 points) “Does not meet expectations,” (1 point) “Emerging; “(2 points) “Meets expectations;” (3 points) “Exceeds expectations.” At the end of each placement the teacher candidate, faculty supervisor, and the cooperating teacher hold a 3-way meeting (typically about 1.5 hours) to discuss the teacher candidate’s performance and decide on a consensus score for each item of the form. The CCAST form includes 21 items.

At the end of the first student teaching placement, all teacher candidates must score at the “meets expectations” (2) level or above on at least 13 categories and at the “emerging” (1) level on at most 8 categories (with no categories scored at the “does not meet expectations” (0) level).

At the end of the second student teaching placement, all teacher candidates must achieve an average score of 2 –“meets expectations” level –with no score below 1 –“emerging” level –in order to graduate from student teaching.

Candidates who fail to meet any of these requirements may be required to repeat the course, or will be allowed to complete the course pending the satisfactory completion of additional remedial work.

6.6.3 Teacher Candidate Work Sample

The Teacher Candidate Work Sample assessment is designed to support teacher candidates in their professional growth by engaging them in designing a unit of sequential lessons, based on their knowledge of content, theory, research, and knowledge of their students. The project also allows the programs to collect important evidence that candidates are able to perform competently as mathematics teachers, using their acquired knowledge and skills to promote student learning in classroom settings. The Teacher Candidate Work Sample will be completed by teacher candidates in their last semester of student teaching. The basic principles underlying the Teacher Candidate Work Sample are that students learn best when:

- the teacher designs and implements developmentally appropriate and challenging learning experiences;
- the teacher creates learning environments that support individual and collaborative learning, encourages positive social interaction, active engagement and motivation;
- the teacher sets challenging learning goals that address the New York State Common Core Standards for Learning;
- the teacher uses pre-assessments and multiple assessments aligned with learning goals at key points in the instructional sequence, in order to monitor student learning and to modify instruction according to student needs;
- the teacher plans lessons and selects instructional strategies that take into account prior student learning, abilities, resources and needs of the students;
- the teacher uses assessment data to analyze student learning and provides appropriate and useful feedback to students, parents, and colleagues; and
- the teacher is a reflective practitioner: the teacher reflects upon his or her own teaching and practices in order to adapt instruction, improve student learning, and promote professional growth.

The Teacher Candidate Work Sample has 15 rubrics. The performance levels set by each rubric of the are 5: from 1 to 5 with respectively assigned score of (0 points) to (5 points).

The desired outcome is level 3 or above, on each rubric. A teacher candidate should score at a minimum at level 3 or above on at least 8 of the rubrics and minimum score of 2 on at most 7 of the rubrics (or a total score of 38).

Candidates who fail to meet any of these requirements may be required to repeat the course.

6.7 Program Completer Survey

The survey is administered at the end of each semester or academic year and sent to students who are graduating in the current year from each program.

6.8 Discontinuation from the Program

The Mathematics Education Program makes every effort to provide teacher candidates with the opportunity to succeed. However, candidates who consistently perform substantially below the level expected of candidates at a given stage in the program with respect to knowledge, skills or dispositions may be discontinued from the program.

The most important review point will be when candidates apply for student teaching. The programs reviews the candidates progress for determining whether candidates are qualified for student teaching. Admission to student teaching may be denied or made contingent upon the successful completion of specified assignments.

Candidates who do not perform satisfactorily in student teaching may be permitted to repeat student teaching, though this is not automatic and such permission may be made contingent upon the successful completion of specified assignments.

Chapter 7

The New York State Teacher Certification System

Under the New York State regulations, candidates who complete an approved teacher education program will be eligible for an initial license and must earn an approved masters degree within five years in order to qualify for a professional license. This professional license will not be valid for life, and teachers will have to satisfy a continuing professional education requirement in order to maintain their license. Additional information on state certification requirements can be found on the New York State Education Department's site. Important Note: Please note that state certification requirements are constantly being revised, and teacher candidates must satisfy the requirements in effect at the time of their certification application. It is the responsibility of the teacher candidate to keep abreast of any relevant changes.

7.1 Initial State Licensure

The City Tech Mathematics Education Program is an approved New York State program. If you complete our program, the college will recommend you for initial licensure, which is ultimately granted by the New York State Department of Education. In addition to completing the City Tech program requirements described previously, teacher candidates must also satisfy the following New York State and/or college requirements to receive the initial license. These certification requirements are valid as of the beginning of the current academic year.

- Completion of all courses required by the program.
- 130 hours of pre-service clinical experience (at least 20 hours of which are spent working with ELL (English language learners), and 20 with students with special needs.

- The City Tech Mathematics Education Program requires one semester (70 days) of supervised student teaching.
- One semester of a language other than English at the college level.
- New York State requires all teacher candidates who are applying for initial certification to pass several standardized tests: Educating All Students Test (EAS), and a relevant Content Specialty Test (CST).¹
- Students should visit the NYSTCE site to get an overview of the fields of knowledge assessed on these tests, and for the most up-to-date information pertaining to these requirements. It is also recommended that students contact their program director for guidance in this process.
- Completion of DASA – (Dignity for All Students Act) workshops.
- Fingerprinting.²
- Candidates for license must also access the TEACH online system to apply for license. This online application is in addition to and distinct from any information imparted by the college on a student’s behalf to New York Education Law now permits Non-resident Aliens to qualify for an initial license. Individuals with United States Citizenship or Permanent Resident status may qualify for a Permanent or Professional New York State Teaching For additional information, please visit the NYSED certification page dealing with citizenship. Please note that in many cases the City Tech requirements are more rigorous than the New York State requirements. Candidates are required to comply with the City Tech regulations in order to complete the program.

7.2 CST (004 Mathematics)

CST is a computer-based test with 90 selected-response items and one constructed-response item. The former measure content knowledge and latter measures pedagogical content knowledge. The constructed-response item is scenario-based and requires candidates to describe an instructional strategy to help students achieve a specific learning goal or an

¹As of April 27, 2022, the NYS Education Department eliminated the edTPA as a certification requirement. Effective September 1, 2023, in lieu of the edTPA, all students in teacher preparation programs will be required to complete a teacher performance assessment. This assessment will be developed, administered, and evaluated by City Tech instructors. NYS Certification Exams

²Currently, the State Education Department asks if applicants for certification have ever been convicted of a crime other than a minor traffic violation. Conviction does not automatically prevent a person from becoming a teacher. However, if you have an issue, you should consult with the New York State Education Department and/or an attorney before applying to a teacher education program.

instructional intervention to address a specific learning difficulty, and to provide a rationale for employing that instructional strategy or intervention. The selected-response items count for 80% of the total test score and the constructed response item counts for 20%, as indicated in the table that follows. Each selected-response item counts the same toward the total test score. The percentage of the total test score derived from the constructed-response item is also indicated in the table that follows. The selected response items are chosen from the following areas of mathematics: Number and Quantity, Algebra, Functions, Calculus, Geometry and Measurement, and Statistics and Probability. Currently, the passing score is set to 520.

7.3 EAS (Education All Students)

This test consists of selected-response items and constructed-response items. Each constructed-response item will share scenario-based stimulus material with several selected response items. The selected-response items count for 70% of the total test score and the constructed response items count for 30%, as indicated in the table that follows. Each selected-response item counts the same toward the total test score. The percentage of the total test score is derived from each of the constructed-response items. The selected-response items are chosen from the following areas: Diverse student population, English language learners, students with disabilities and other special needs, Teacher responsibilities, School-Home relationships. The constructed-response items are drawn from the first three areas. Currently, the passing score is set at 520.

References

[1] City Tech website, <https://www.citytech.cuny.edu/>

[2] CUNY website, <https://www.cuny.edu/>

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Appendix A

Advisement Plan Sheet

11/10/16



New York City College of Technology
 Bachelor of Science in Mathematics Education
 Program of Study Advisement Checklist: PATHWAYS CURRICULUM

Student Name	
Faculty Advisor	
Faculty Advisor Email	
Semester/Year	

FRESHMAN YEAR I				
Fall Semester				
Course Number and Title	Credits	Prerequisites	Completed	Assigned
MAT1475 Calculus I	4	MAT1375		
ENG1101 English Composition I	3	CUNY proficiency R/W		
US Experience and Diversity	3			
Life and Physical Sciences	3			
Spring Semester				
Course Number and Title	Credits	Prerequisites	Completed	Assigned
MAT1575 Calculus II (Flexible Core-Scientific World)	4	MAT1475		
MAT2580 Linear Algebra	3	Pre/Coreq: MAT1575		
ENG1121 English Composition II	3	ENG1101		
PSY1101 Intro. to Psychology	3	CUNY proficiency R/W		
WCGI Foreign Language ¹	3			

SOPHOMORE YEAR II				
Fall Semester				
Course Number and Title	Credits	Prerequisites	Completed	Assigned
MAT2571 Intro. to Proofs and Logic	4	Pre/Coreq: MAT1575		
MAT2675 Calculus III	4	MAT1575, MAT2580		
MEDU1010 Foundations of Mathematics Education	3	CUNY proficiency R/W		
COMM1330 Public Speaking	3	CUNY proficiency R/W		
CE Creative Expression	3			
Spring Semester				
Course Number and Title	Credits	Prerequisites	Completed	Assigned
MAT 1372 Statistics and Probability	3			
MAT3075 Intro. to Real Analysis	4	MAT1575; and MAT2571		
MAT 3080 Modern Algebra	4	MAT1575; and MAT2571		
MEDU1021 Teaching and Learning Strategies for Math. Teachers	3	MAT1375, CUNY proficiency R/W		
MEDU 2901 Peer Leader Training in Mathematics	3			

JUNIOR YEAR III				
Fall Semester				
Course Number and Title	Credits	Prerequisites	Completed	Assigned
MAT3050 Geometry	4	MAT2571		
MEDU 3000 Mathematics of the Secondary School Curriculum	4	ENG1101, PSY1101		
MEDU3001 Methods of Teaching Middle School Mathematics	4	Pre/Coreq: MEDU2010, ENG1121		

Add Flex Core Additional Common Core Course	3			
Spring Semester				
Course Number and Title	Credits	Prerequisites	Completed	Assigned
Liberal Arts Elective	3			
Liberal Arts Elective	3			
EDU2455 Methods and Materials for Special Needs Students	3			
MEDU3002 Methods of Teaching Secondary School Mathematics	4	MEDU1010		
Free Elective (as needed)				

SENIOR YEAR IV				
Fall Semester				
Course Number and Title	Credits	Prerequisites	Completed	Assigned
MAT4030 History of Mathematics	3	MAT 2071; and MAT 3021		
MEDU 3003: Microteaching	3	MEDU 1010, MEDU 3001 or MEDU 3002		
EDU 3670: Methods of Literacy Instruction	3			
ID Interdisciplinary Course	3			
Free Elective (as needed)				
Spring Semester				
Course Number and Title	Credits	Prerequisites	Completed	Assigned
MEDU4000 Supervised Student Teaching and Seminar in Middle and Secondary School Mathematics	4	MEDU3001 and MEDU3002 and permission of dept.		
MEDU4001 Supervised Student Teaching in Middle School	4	MEDU3001 and MEDU3002 and permission of dept.		
MEDU4002 Supervised Student Teaching in Secondary School	4	MEDU3001 and MEDU3002 and permission of dept.		

	Completed	Assigned
Total Credits		

Mathematical Applications Electives (choose credits to make 120 Credits)	
ARCH 2480 Principles of Stability in Structures 3 ARCH 3522 A History of New York City Architecture 3 ARCH 3551 Sustainability: History and Practice 3 ARCH 3640 Historic Preservation Theory and Practice 3 ARCH 4880 Survey of Structural Systems and Building Infrastructure 3	CET 3510 Microcomputer Systems Technology 4 CET 3525 Electrical Networks 4 CET 3625 Applied Analysis Laboratory 1 CET 3640 Software For Computer Control 3 CET 4705 Component and Subsystem Design I 2 CET 4773 Microcomputer Interfacing 4 CET 4805 Component and Subsystem Design II 2
MAT 2675 Calculus III 4 MAT 3672 Probability and Mathematical Statistics II 4 MAT 2680 Differential Equations 3 MAT 3770 Mathematical Modeling I – Optimization 3 MAT 4880 Mathematical Modeling II 3 MEDU 2901 Peer Leader Training in Mathematics 1	CST 1101 Problem Solving with Computer Programming 3 CST 2403 Introductory C++ Programming Language Part I 3 CST 3503 C++ Programming Part II 3
EET 1102 Techniques of Electrical Technology 2 EET 1122 Circuit Analysis I 4 EET 1222 Circuit Analysis II 5	PHYS 2443 Physics 3.3 4 PHYS 2605 Introduction to Laser Physics and Photonics 4 PHYS 1117 Astronomy I 4

¹ If the foreign language requirement has been met, but the student has not taken a 3-credit foreign language course, the student may take any World Cultures/Global Issues course.

² An advanced liberal arts course must be at the 2000 level or higher, and has a prerequisite in the same or a closely related discipline. Also, it cannot be a required course in the program. The requirement may also be met by taking two sequential courses in a foreign language.

Appendix B

Clinical Experiences Timesheet

Student Teaching Log for Student Teachers - Spring 2023												
Student Teacher:					School:							
Date	Mark 1 if present, 0 if absent	Activities (also add O for online and I for in-person)	Grade	Cooperating Teacher	Total Hours Spent						Cooperating Teacher's Initials	
					Conferencing	Observing	Teaching	Other	Specify	Total		
27-Mar												
28-Mar												
29-Mar												
30-Mar												
31-Mar												
3-Apr												
4-Apr												
5-Apr												
17-Apr												
18-Apr												
19-Apr												
20-Apr												
24-Apr												
25-Apr												
26-Apr												
27-Apr												
28-Apr												
1-May												
2-May												
3-May												
4-May												
5-May												
8-May												
9-May												
10-May												
11-May												
12-May												
15-May												
16-May												
17-May												
18-May												
19-May												
22-May												
23-May												
24-May												
25-May												
26-May												
Total												

Appendix C

Initial Field Experience Introduction Letter



NEW YORK CITY
COLLEGE OF TECHNOLOGY
THE CITY UNIVERSITY OF NEW YORK
300 JAY STREET, BROOKLYN, NY 11201-1909

MATHEMATICS DEPARTMENT
Namm 711
718.260.5380 • Fax: 718.254.8537

XXX School
XXX
Brooklyn, NY 11201

XXX, 2023

Re: Spring 2023 Math Teaching Observation Placement

Dear Principal XXX:

This is a letter of introduction for XXX, who is a student in the Mathematics Education Program at New York City College of Technology (City Tech) of the City University of New York (CUNY). XXX is enrolled in Methods of Teaching Secondary School Mathematics (MEDU 3002) in Spring 2023. This course requires that students observe a total of 25 clock hours of high school mathematics teaching. We sincerely appreciate your consideration in allowing XXX to complete 25 hours observing mathematics teaching at your high school. XXX's email is XXX.

XXX is required to keep a timesheet signed by the observed teacher. We appreciate your assistance in nominating an experienced mathematics teacher, who currently teaches 9-12 grade to be observed by XXX.

We highly value the collaborative relationship that we share and hope to maintain it into the future as our program continues to grow and thrive.

Thank you for providing XXX with this great opportunity. Please feel to contact me if you have any questions.

Sincerely,

Ariane Masuda, Director of Clinical Experiences, Mathematics Education Program, Professor of Mathematics, NYCCT

CC: Nadia Kennedy, Mathematics Education Program Director, Associate Professor of Mathematics, NYCCT

Appendix D

Intermediate Field Experience Introduction Letter



NEW YORK CITY
COLLEGE OF TECHNOLOGY
THE CITY UNIVERSITY OF NEW YORK
300 JAY STREET, BROOKLYN, NY 11201-1909

MATHEMATICS DEPARTMENT
Namm 711
718.260.5380 • Fax: 718.254.8537

XXX School
XXX, Brooklyn, NY 11201

XXX, 2023

Re: Spring 2023 Microteaching Placement

Dear Assistant Principal XXX:

This is a letter of introduction for XXX, who is a student in the Mathematics Education Program at New York City College of Technology (City Tech) of the City University of New York (CUNY). XXX enrolled in Microteaching (MEDU 3003) in Spring 2023, which requires that each student spends a total of 60 clock hours of teacher-mentored, middle or high school mathematics classroom experience. This is an intermediate field experience. The student is expected to shadow the teacher and get involved in teacher supporting activities, which may include tutoring, exam grading, helping the teacher with preparing lesson materials, working with small groups of students, and teaching a couple of lessons. In order to enrich the student's experience, it would be great if 20 hours could be spent working with ELL (English language learners) and 20 hours with students with special needs. We sincerely appreciate your consideration in allowing XXX to complete this microteaching requirement at your school. XXX's email is XXX.

We appreciate your assistance in nominating an experienced mathematics teacher to mentor XXX. She is required to keep a timesheet signed by the mentoring teacher. We ask that the mentoring teacher complete the Pre-CPAST evaluation and have a short conference (1-1.5 h) with the college supervisor and the student at the end of the placement.

We highly value the collaborative relationship that we share and hope to maintain it into the future as our program continues to grow and thrive. In recognition of our appreciation, we are offering 10 CTLE credits to the cooperating teacher.

Thank you for providing XXX with this great opportunity. Please feel free to contact me if you have any questions.

Sincerely,

Ariane Masuda, Director of Clinical Experiences, Mathematics Education Program, Professor of Mathematics, NYCCT

CC: Nadia Kennedy, Mathematics Education Program Director, Associate Professor of Mathematics, NYCCT

Appendix E

Student Teaching Introduction Letter



NEW YORK CITY
COLLEGE OF TECHNOLOGY
THE CITY UNIVERSITY OF NEW YORK
300 JAY STREET, BROOKLYN, NY 11201-1909

MATHEMATICS DEPARTMENT
Namm 711
718.260.5380 • Fax: 718.254.8537

XXX School
XXXX

XXX, 2023

Re: Spring 2023 Student Teaching Placement

Dear Principal XXX, Math Assistant Principal XXX, and Ms. XXX:

This is a letter of introduction for XXX, who is a student in the Mathematics Education Program at New York City College of Technology of The City University of New York (CUNY). XXX enrolled in Supervised Student Teaching practice in Spring 2023, which is required for New York State certification as a teacher of mathematics. The program consists of seven weeks of full-time teaching practice in middle school and seven weeks of full-time teaching practice in high school. We sincerely appreciate your consideration in allowing XXX to complete his student teaching practice in mathematics at your high school. XXX's email is XXX.

Responsibilities of the student teacher: The student teacher is required to be at your school for a minimum of 7 complete weeks of full-time practice for the full length of the school days (total of 25 hours per week) and is required to keep a timesheet signed by the cooperating teacher. The student teacher's responsibilities include working closely with the cooperating teacher and learning from her as an experienced professional as he develops his own teaching style. The student teacher is expected to assist the cooperating teacher in preparing lesson materials and assessing students, as well as working with small groups and teaching lessons. The student teacher is also required to assemble a teaching portfolio, which includes 3-5 lesson plans with pre- and post-assessments, copies of student samples of the post-assessment with written feedback, and two 15-minute videos of his own teaching of those same lessons. The student teacher is expected to plan the lessons, teach them, administer pre- and post-assessments, and organize the videotaping of the lessons.

Cooperating Teacher's Responsibilities: The cooperating teacher is a vital partner in the teacher preparation process. Her role is to serve as mentor by guiding the student teacher in the development of pedagogically sound and appropriate knowledge and skills. We ask the cooperating teacher to nurture, but also to direct the beginning teacher through providing regular guidance and feedback, and through encouraging critical self-reflection on the practice. We would appreciate it if the cooperating teacher could provide the student with as many teaching opportunities as possible, including opportunities for collaborative lesson planning, collaborative assessment, and analysis of student learning, as well as engaging in other teaching activities.

Ideally, the student teacher will begin teaching some portions of lessons in the second week of the placement, and will gradually be given more teaching responsibilities, until he assumes full teaching responsibility, i.e. preparing and teaching lessons, grading, school-time duties (study

halls, hall duty, recess), faculty meetings, etc. It is extremely important that the cooperating teacher provides regular guidance in the preparation of lesson plans and feedback as to the effectiveness of the teacher candidate's teaching performance, and that, before offering her own expert evaluation, she encourages the student teacher to engage in self-evaluation as to the effectiveness of the lesson he has taught through identifying both strengths and weaknesses. It is also very important to identify, as early as possible, serious problems with teaching performance, receptiveness towards constructive feedback, and professional behavior. If you have a serious concern, we encourage you to contact us directly.

Student Teacher Evaluation: The student teacher's final grade will be based on the evaluation of the cooperating teacher as well as the college supervisor. We ask that the cooperating teacher completes the *CPAST Evaluation Form* for one of the student teacher's lessons -- ideally one lesson at the end of the placement. We also expect that the cooperating teacher will have a conference with the college supervisor and the student at the end of the placement. Typically, it takes between 60 and 90 minutes. We will also ask the mentor to complete a short survey toward the end of the placement.

Again, thank you! We value the collaborative relationship that we share highly and hope to maintain it into the future as our program continues to grow and thrive. We do recognize the amount of effort, time, and energy. Our appreciation is only heightened as we consider all the other demands that the teaching profession is making on its practitioners, especially in this historical moment. In recognition of those added burdens, we are offering 10 CTLE credits along with our customary voucher for a 3-credit course that can be used at any CUNY campus, awarded for the student teaching mentorship and for the assessment and survey that the cooperating teacher will complete at the end of the placement. Please feel to contact us if you have any questions.

Sincerely,

Ariane Masuda, Director of Clinical Experiences, Mathematics Education Program, Professor of Mathematics, NYCCT

CC: Nadia Kennedy, Mathematics Education Program Director, Associate Professor of Mathematics, NYCCT

Appendix F

Confidentiality Agreement

Candidate Confidentiality and Non-Disclosure Agreement

I, _____ (name) understand and accept the following conditions regarding confidentiality and non-disclosure of confidential information while completing my clinical experience at _____ (the “school”)

- 1) In the performance of my clinical experience, I will be given access to data and information the school has determined to be confidential. This includes student records and may also include records of faculty or staff, business information, correspondence and other material.
- 2) Confidential information may come in various forms and formats including, but not limited to hardcopy, photocopy, microform, automated and/or electronic form, visual and verbal.
- 3) I am familiar with and understand the Family Educational Rights Privacy Act (“FERPA”) and its application to student education records. I am also aware that in New York State, Education Law Section 2-d exceeds FERPA by requiring additional protections of student data as well as teacher and principal annual professional performance (“APPR”) data.
- 4) I will not access confidential information, particularly student data, unless I am authorized by my school supervisor to do so, and I agree to maintain the confidentiality and privacy of confidential information, particularly student data, during and after my clinical experience. I shall not communicate verbally, in writing, by email or any other manner any confidential information to any third party including, my college supervisor as well as other colleagues, fellow students, friends and family members.
- 5) I am, or agree to become, familiar with the school's data privacy and security policies, the parents' bill of rights and FERPA policies.
- 6) I agree to attend any training on data privacy and security that the school may require.

(Candidate)

(date)

(School)

(date)