

**Department of Mathematics, Science and Technology
Program in Mathematics**

Study Guide for Mathematics Education

Degree: M.A.

Major Code: MATH-INIT

This academic Program Study Guide has been developed to assist you in planning your course of study at Teachers College. Below you will find the Study Guide for the program to which you have been admitted.

We hope this Study Guide provides a helpful introduction and orientation to your degree program. Given the richness and complexity of graduate and professional programs at Teachers College, these Study Guides are intended to be illustrative, rather than definitive. The Teachers College Catalog (<https://www.tc.columbia.edu/catalog/>), for the year in which you were admitted, remains the official reference document for College policies and Program in Mathematics requirements for each degree plan. For doctoral degrees, additional documentation can be found in the appropriate doctoral requirements bulletin, which is available online through the Office of Doctoral Studies (<https://www.tc.columbia.edu/doctoral/forms/requirements/>).

Congratulations, again, on your admission to graduate study at Teachers College, Columbia University!

TEACHERS COLLEGE COLUMBIA UNIVERSITY

A Graduate School of Education, Health & Psychology

Department of Mathematics, Science and Technology Program in Mathematics

Degree in: MATHEMATICS EDUCATION

Master of Arts in Mathematics Education with NY State Initial Secondary Certification (Pre-service program)

Master of Arts Degree with NY State Initial
Certification 7-12 (M.A.)

Major Code: MATH-INIT

Brief Program Description

The Master of Arts degree with initial certification is a professional degree leading to a New York State initial certificate for teaching secondary school mathematics (grades 7-12)¹. The program of study for the degree is designed to increase the teacher's knowledge of mathematics and prepare them for the profession of teaching. The program can be completed in one calendar year through full-time study during an academic year and a dual summer session, or spread across two academic years.

Prerequisite Requirements

Admission to the program requires evidence of ability to be prepared for certification to teach secondary school mathematics. Normally, (i) an undergraduate major in a mathematical science or strong minor in a mathematical science (an equivalent of 24 credit hours) that includes substantial coursework beyond calculus is required, and (ii) one year of college level study, or its equivalent, of a language other than English. Students are referred to the Admission Bulletin of the Teachers College Catalog for general information concerning admission and degree requirements (<https://www.tc.columbia.edu/catalog/admission/>).

Minimum Point Requirement

The program of study for the pre-service M.A. with initial certification degree must include a minimum of 36 points of graduate study under Teachers College auspices. (The point requirements include the 32 points required for the master's degree, and an additional 4

¹ New York has certification reciprocity with over 40 states. More information on reciprocity or options around state certification can be found from the Office of Teacher Education (<http://www.tc.columbia.edu/ote/>).

points of student teaching.) Normally students complete at least 24 points in Program in Mathematics courses.

Course Requirements

Courses offered within the Program in Mathematics (MSTM) tend to be either mathematics content or mathematics education courses (the latter of which include our courses in research methods). The program of study has certain requirements (see the Table below) – though there are few specific courses that are required. Students' precise programs of study should be determined in consultation with their program advisor.

1. Mathematics Content Breadth in mathematics content in order to enrich student's undergraduate preparation. Students will need to provide documentation that their composite undergraduate and graduate mathematical profile includes coursework in all of the following areas: (i) Number theory/historical topics, (ii) Algebra, (iii) Geometry/topology, (iv) Calculus/analysis, (v) Discrete mathematics, and (vi) Probability/statistics. Students are also encouraged to include coursework on mathematical models/applications.	At least 12 points
2. Mathematics Education Theory and methods courses in the teaching of mathematics must include the following two required courses: MSTM 4019 <i>Mathematics Teaching and Learning</i> (3 points), which discusses theoretical aspects of teaching and learning, and MSTM 5011 <i>Mathematics in the Secondary School</i> (3 points), which is a methods course dealing with issues of classroom teaching and includes field experiences during the school day. To satisfy a state requirement for <u>understanding history, philosophy, and the role of education</u>, one other professional course in mathematics education can be taken. Recommended courses to meet this requirement include MSTM 5020 <i>Mathematics and Multicultural Education</i>, MSTM 4020 <i>Mathematics Teaching and Learning II</i>, and MSTM 4005 <i>Teaching Mathematics in Diverse Cultures</i>. (Alternatively, to satisfy this state requirement candidates can enroll in a relevant course outside of the Program. In this case additional points in mathematics education can be obtained in other methods courses offered by the program.)	At least 8 points

3. General Professional Education Teachers College courses outside the Program in Mathematics related to general educational foundations or broader professional issues that are useful for mathematics educators, which must meet the following requirements: • a course in human development (2 or 3 points) which must include at least one of the following required courses: HUDK 4027 <i>Development of Mathematical Thinking</i>, HUDK 4023 <i>Developmental Psychology: Adolescence</i>, or HUDK 5023 <i>Cognitive Development</i>; • a course in the nature of students within the full range of disabilities and inclusive education (3 points), which must include at least one of the following required courses: C&T 4001 <i>Teaching Students with Disabilities in Inclusive Classrooms</i>, C&T 4046A <i>Multifoundational Approach to Learning Disabilities</i>, or HBSE 4002 <i>Instruction and Curriculum for Students With and Without Disabilities</i> (alternatively, students can enroll in MSTM 4023 <i>Mathematics for Exceptional Students</i> to meet this requirement, but which then does not count towards the General Professional Education requirements). • a course in language acquisition and literacy development (3 points), which must include either C&T 4137 <i>Literacy and Learning in the Content Areas</i> (3 points) or C&T 4842 <i>Institute: Content Area Literacies</i> (3 points). Based on an analysis of their undergraduate transcripts, students and their advisor should decide whether any more courses in teaching literacy are needed in addition to this one requirement.	At least 8 points
4. Student Teaching Supervised teaching experiences in metropolitan area secondary schools, fulfilled by completing the required course MSTM 4760 <i>Student Teaching in Mathematics</i> (4 points).	4 points

Additional Program Requirements

Breadth Requirement

The College breadth requirement is fulfilled through the General Professional Education course requirement.

Master's Degree Integrative Project Requirement

The Integrative Project, or “Departmental Special Project,” is a requirement for all master’s degrees. Toward the end of your program of study, a culminating paper should be submitted to your program advisor that makes connections among the various courses you have taken as well as any field experiences, thus demonstrating an ability to integrate various aspects of the M.A. program. The paper should (i) specify a key issue in mathematics education, (ii) reflect on this issue in relation to existing scholarly literature, and (iii) provide potential implications for teaching; it should be approximately ten typewritten pages with a title page that includes the designation “Departmental Special Project” and the date submitted.

Official deadlines for applying to graduate and for submission of the project for approval by an advisor can be found on the College’s Academic Calendar for the appropriate academic year (<https://www.tc.columbia.edu/academics/academic-calendar/>). The table below provides approximate deadlines.

To graduate in:	Submit approved application for degree to Registrar by:	Submit paper and obtain approval from Department by:
May	Approximately February 1	Approximately April 30
October	Approximately August 1	Approximately August 1
February	Approximately November 1	Approximately December 15

Cumulative Portfolio Requirement

The program of study includes submission of a cumulative portfolio. Further information about each component of the cumulative portfolio is available from a program advisor.

In addition to the other requirements listed on this program study guide, students must complete a project – typically a paper – with a focus on diversity or multiculturalism in mathematics education.

Continuous Enrollment Requirement

Students must register for courses beginning with their initial term of entry and continuing each fall and spring term until their degree requirements have been met. To meet the continuous enrollment requirement students must register for coursework, register as a master’s candidate or doctoral candidate, or request and receive a leave of absence.

Transfer Credit Evaluation

By College policy, no transfer credits can be applied to the M.A. degree, though prior class work may count towards certification requirements. Consult a program advisor for further information. If you choose to continue on for an advanced master’s degree (M.S. or Ed.M.), up to 30 points of acceptable prior graduate credits can be applied to the degree.

Statement on Satisfactory Progress and Academic Performance

Students are expected to make satisfactory progress toward the completion of degree requirements. Program faculty will review each student's progress annually. If a student is performing below expectations he/she may be required to complete additional coursework. The program will provide a plan and timeline for remediation so students know the expectation for them to continue in the program. Certification students whose academic performance is unsatisfactory cannot begin the student teaching experience. If satisfactory progress is not maintained a student may be dismissed from the program. For additional information about Academic Performance, please refer to Policy on Degree Requirements in the Policies of the College (<https://www.tc.columbia.edu/policy/>).

An average grade of B or better is expected for satisfactory completion of the degree. According to College policy, no more than 3 points of C- may be credited toward any degree, certificate or diploma. Students completing requirements for more than one degree or diploma may count 3 points of C- toward only one such award. Students who accumulate 8 points or more with grades of C- or lower may not continue study at the College and will not receive a degree or diploma.

Standard Policies and Procedures

Included below are some other pertinent policies and procedures, taken from Policies in the Teachers College Catalog (<https://www.tc.columbia.edu/catalog/>) and other Policies of the College (<https://www.tc.columbia.edu/policy/>). Further information, and all other policies, can be found online.

Accommodations

The College will make reasonable accommodations for persons with documented disabilities. Students are encouraged to contact the Office of Access and Services for Individuals with Disabilities for information about registration (301 Zankel Hall). Services are available only to students who are registered and submit appropriate documentation.

Statement on Academic and General Conduct

Students are expected to observe traditional norms of scholarly discourse and academic integrity, and engage in responsible social conduct. They are to refrain from any conduct, including cheating, plagiarizing, harassment, or discrimination, that calls into question their academic or professional probity. Decisions regarding academic evaluation in all aspects of students' work at the college, including coursework, certification examinations, clinical or field experiences, and preparation of dissertations, are within the sole jurisdiction of the faculty concerned, including as appropriate, the department or program staff members. Disciplinary actions (e.g., reprimand, suspension, or expulsion) in cases of academic misconduct can be imposed by the Vice Provost for Student Affairs or the Student Conduct Committee.

Academic Program Concerns and Grievance Procedures

Any student who has a concern regarding an academic or other matter may seek assistance. The College provides both informal and formal dispute resolution procedures. The procedure for resolving academic program concerns (see also the note on grade correction procedures below) begins with the student contacting either the faculty member (if the concern is related to a course) or the student's program advisor. If the student is not satisfied with the response or resolution achieved at this first level, or if speaking with the faculty member presents a conflict of interest for the student, the student should proceed to speak with the Program Director in the area in which the academic concern resides. If the student is not satisfied with the response or resolution achieved through the Program Director, the student can contact the Vice Provost for Student Affairs. At any stage of the process, students are welcome to seek the advice and guidance of the Ombudsman, who is charged with attempting to informally resolve student dissatisfaction of an academic nature on a completely confidential basis.

Grade Correction Procedure

The instructor for a course has the responsibility for setting the requirements for a course and making an evaluation of students' work. All grades other than Incomplete are final once submitted to the Office of the Registrar. Once final grades have been given, instructors may not change them unless errors occurred in the original transmission of grades. If a student believes that an error has been made, the student must take the initiative to bring about the necessary correction prior to the conclusion of the semester immediately following the semester in which the course was taken. The normal procedure for effecting a correction of a final grade on the official student record would be through direct discussion between the student and the instructor. If redress cannot be attained through such discussions, the student may next appeal to the department chairperson of the department offering the course. If resolution cannot be attained through appeal, the student may next appeal to the Vice Provost for Student Affairs. In situations where the student feels that such an appeal process might not be in the student's interest, counsel and assistance can be sought from the Ombudsman or the Vice Provost for Student Affairs.

Appendix

Point Allocation Chart

M.A. Degree in Mathematics Education with NY State Initial Certification (MATH-INIT)

The following table provides *recommendations* for a program of study, as well as *example* courses. The recommendations align with, and fulfill all of, the course requirements given previously, though they may not be the only ways of doing so. Notably, there is a degree of choice in the specific courses used to fulfill the requirements; the example courses do not necessarily indicate ones recommended over others. The specifics of all programs of study should be determined in consultation with the student's program advisor.

Recommended Competencies	Points Recommended	Example Courses
1. Breadth in mathematics content, with composite profile including: (i) Number theory/historical topics, (ii) Algebra, (iii) Geometry/topology, (iv) Calculus/analysis, (v) Discrete mathematics, and (vi) Probability/statistics.	12-14	Number Theory (MSTM 4031) Exploring Secondary School Mathematics (MSTM 4034) Topics in Algebra (MSTM 5033) Topics in Geometry (MSTM 5032) Problem Solving (MSTM 5023) Topics in Discrete Mathematics (MSTM 5036)
2. Mathematics education professional competencies in theory and methods.	8-10	*Mathematics Teaching and Learning (MSTM 4019) *Mathematics in the Secondary School (MSTM 5011) Mathematics and Multicultural Education (MSTM 5020)
3. Background in general professional education.	8-9	Development of Mathematical Thinking (HUDK 4027) Teaching Students with Disabilities in Inclusive Classrooms (C&T 4001) Literacy and Learning in the Content Areas (C&T 4137)
4. Student teaching.	4	*Student Teaching in Mathematics (MSTM 4760)

* Indicates required course