

MATHEMATICS EDUCATION (MTHED-UE)

MTHED-UE 1000 Independent Study (1-6 Credits)

Typically offered Fall

It should be noted that independent study requires a minimum of 45 hours of work per point. Independent study cannot be applied to the established professional education sequence in teaching curricula. Each departmental program has established its own maximum credit allowance for independent study. This information may be obtained from a student's department. Prior to registering for independent study, each student should obtain an Independent Study Approval Form from the adviser.

Grading: Ugrd Steinhardt Graded

Repeatable for additional credit: Yes

MTHED-UE 1023 Mathematics in Childhood Education I (3 Credits)

Typically offered Fall

A methods course focusing on how to teach mathematics at the elementary school level. Use a variety of manipulatives & the development of concepts and skills.

Grading: Ugrd Steinhardt Graded

Repeatable for additional credit: No

MTHED-UE 1024 Mathematics in Childhood Education II (3 Credits)

Typically offered Spring

A methods course focusing on how to teach mathematics at the elementary school level. Use of a variety of manipulatives & the development of concepts & skills

Grading: Ugrd Steinhardt Graded

Repeatable for additional credit: No

MTHED-UE 1032 Mathematics in Early Childhood Education I (3 Credits)

Typically offered Spring

How mathematics is learned through the social experiences of young children. Analysis of activities in early childhood settings that help children develop insight into mathematics both as a study in itself & as a tool for applied use. Focus on the mathematical concepts that infuse young children's experiences, the use of mathematical tools in young children's learning, methods for adapting math curriculum for learners with diverse abilities, & the relationship of mathematical learning to all areas of the curriculum.

Grading: Ugrd Steinhardt Graded

Repeatable for additional credit: No

MTHED-UE 1033 Mathematics in Early Childhood Education II (3 Credits)

Typically offered Fall

How mathematics is learned through the spatial/temporal worlds of young children. Analysis of activities in early childhood settings that help children develop emerging, unprejudiced mathematical awareness. Focus on the mathematical environment that respects all learners as a means to build upon children's existing mathematical perceptions & expand and further those reading.

Grading: Ugrd Steinhardt Graded

Repeatable for additional credit: No

MTHED-UE 1041 The Teaching of Rational Numbers, Grades 5-12 (3 Credits)

Typically offered Fall

This course provides a link between teachers' mathematical knowledge & understanding of the major skills & concepts of ratios, proportions, percents, decimals & fractions to the effective & appropriate teaching of these topics in grades 5-12.

Grading: Ugrd Steinhardt Graded

Repeatable for additional credit: No

MTHED-UE 1043 Teaching of Secondary Schools Mathematics (3 Credits)

Typically offered Fall

Developing the skills of classroom planning, management, & implementation for effective instructional practices in grades 7-12. Topics include lesson plan development & implementation, different models of teaching, assessing student understanding & the use of instructional technology. Students also visit schools, observe teachers in the classroom & use these observations as the basis for discussions of effective teaching practice. Allows students enrolled in certification programs to accumulate required pre-student teaching fieldwork hours.

Grading: Ugrd Steinhardt Graded

Repeatable for additional credit: No

MTHED-UE 1044 Educational Technology in Secondary School Mathematics (3 Credits)

Typically offered Spring

The course provides an in-depth examination of the affordances & limitations of educational technology in enhancing the teaching & learning of secondary school mathematics. It focuses on the use of handheld & computer technology, & introduces web-based mathematical software, dynamic software, graphical tools & other software that can be successfully incorporated in the middle & high school mathematics classroom. The course offers opportunities to engage in, design, & critique technology-enhanced mathematical activities that aim at developing understanding of school mathematics.

Grading: Ugrd Steinhardt Graded

Repeatable for additional credit: No

MTHED-UE 1045 Teaching of Algebra and Rational Numbers, Grades 5-12 (3 Credits)

Typically offered Fall

This course provides a link between teachers' mathematical knowledge & understanding of the major skills & concepts of algebra & trigonometry to the effective & appropriate teaching of these topics in grades 7 through 12.

Grading: Ugrd Steinhardt Graded

Repeatable for additional credit: No

MTHED-UE 1046 Geometry for Teachers (4 Credits)

Typically offered Spring

This course serves both as a methods course and a math content course. Students will concurrently learn Euclidean Plane Geometry content and equitable pedagogical approaches for teaching this content at the secondary level.

Grading: Ugrd Steinhardt Graded

Repeatable for additional credit: No

MTHED-UE 1047 Teaching of Pre-Calculus and Trigonometry in High School (3 Credits)*Typically offered Spring*

This course provides a link between teachers' mathematical knowledge & understanding of the major skills & concepts of pre-calculus mathematics to the effective & appropriate teaching of these topics in grades 7 through 12.

Grading: Ugrd Steinhardt Graded**Repeatable for additional credit:** No**MTHED-UE 1049 Mathematical Proof and Proving (3 Credits)***Typically offered Spring*

The course introduces elements of mathematical proof, focusing on three main themes: 1. The meaning of mathematical statements – universal/existential; 2. The roles of examples in determining the validity of mathematical statements; 3. The various forms & methods of mathematical proofs, including Direct (deductive) proof; proof by exhaustion; indirect proof (by contradiction, or by contrapositive); mathematical induction; disproof by counterexample. This is a problem-based course. Lessons are structured around activities that engage students in doing proofs that are meaningful to them & based on mathematical topics with which they are familiar

Grading: Ugrd Steinhardt Graded**Repeatable for additional credit:** No**MTHED-UE 1050 Teaching Mathematical Proof and Proving (3 Credits)***Typically offered Fall*

This course complements the content Mathematical Proof & Proving course & provides pedagogical aspects of teaching & learning mathematical proof & proving. The focus is on: 1. Students' difficulties in interpreting the meaning of mathematical; 2. Students' understandings of the roles of examples in determining the validity of mathematical statements; 3. The teaching of various forms & methods of mathematical proofs & bridging between informal & formal proof. Special attention is given to developing students' language precision in mathematics & its implications for teaching, in the course of writing & presenting proofs.

Grading: Ugrd Steinhardt Graded**Repeatable for additional credit:** No**MTHED-UE 1051 Counting and Chance (4 Credits)**

This course is designed to be accessible and approachable for people who will be future teachers of elementary school mathematics. It is also intended for people who want to broaden their knowledge in mathematics and experience it as a relevant, challenging, and enjoyable field. It is not intended for math majors. It will be taught as a problem-based course, that allows for students to explore and develop new ideas, and apply them to real life situations. The course builds on intuitive understandings of fundamental ideas of counting and chance and moves gradually to more formal knowledge of combinatorics and probability concepts and techniques. The learning experiences offered throughout the course are designed to facilitate student interactions and active role in the learning process. Liberal Arts Core/MAP Equivalent - satisfies the requirement for Quantitative Reasoning for Steinhardt students.

Grading: Ugrd Steinhardt Graded**Repeatable for additional credit:** No**MTHED-UE 1080 Teaching of Computer Science (3 Credits)***Typically offered occasionally*

Course is designed to introduce students to the pedagogical approaches & practices associated with teaching computer science at the secondary level. Students will learn methods of teaching secondary CS, but also to become practitioner researchers, taking an evidence-based, questioning, design oriented, analytical, & reflective lens on their teaching practices. Topics include developing learning objectives, theories of learning in CS & computational thinking, instructional approaches, lesson design & implementation, & assessment.

Grading: Ugrd Steinhardt Graded**Repeatable for additional credit:** No**MTHED-UE 1110 Introduction to Computer Science Education (3 Credits)***Typically offered occasionally*

This course will introduce students to a variety of different conceptualizations & implementations of Computer Science education for K-12. Students will discuss and analyze the rationale & purpose of CS teaching behind each case & critique the benefits & challenges from the perspective of K-12 education. This will support students in making informed decisions in their own CS teaching practice & to articulate & justify their decisions. The course will also serve to empower students to participate in future CS curriculum development in their school.

Grading: Ugrd Steinhardt Graded**Repeatable for additional credit:** No**MTHED-UE 1122 Sociopolitical Contexts of STEME Education. (3 Credits)***Typically offered Spring*

This course focuses on pressing issues in science, technology, engineering, math, and environmental (STEME) education and education research—from local classroom contexts to broader institutional and policy levels—and the impact of these issues on teaching and learning. Students make sense of these issues through sociopolitical and sociohistorical lenses and develop informed stances that will shape their emerging work in the education sphere.

Grading: Ugrd Steinhardt Graded**Repeatable for additional credit:** No**MTHED-UE 1274 Fundamental Concepts in Arithmetic (4 Credits)***Typically offered Fall*

This mathematics content course helps students develop understanding of important arithmetic concepts. Besides developing understandings that underlie fractions, ratio, and arithmetic algorithms, students develop greater skill in mathematical justification and communication. Classwork is active, including working in small groups to solve mathematical tasks and participating in whole-class discussions of the mathematical ideas under development.

Grading: Ugrd Steinhardt Graded**Repeatable for additional credit:** No**MTHED-UE 1911 Student Teaching in Mathematics Education: Middle and High School I (3 Credits)***Typically offered Fall and Spring*

One semester supervised student teaching in a mathematics education classroom in middle & high school a minimum of 180 hours within 20 days. Student teaching experiences will be used to support theoretical & practical applications of the planning & implementation of the curriculum. Participation is required in a weekly student teaching seminar which offers a practical examination of teaching problems & practices as they relate to actual classroom teaching.

Grading: Ugrd Steinhardt Graded**Repeatable for additional credit:** No

MTHED-UE 1922 Student Teaching in Mathematics Education: Middle and High School II (3 Credits)*Typically offered Fall and Spring*

One semester supervised student teaching in a mathematics education classroom in middle & high school a minimum of 180 hours within 20 days. Student teaching experiences will be used to support theoretical & practical applications of the planning & implementation of the curriculum. Participation is required in a weekly student teaching seminar which offers a practical examination of teaching problems & practices as they relate to actual classroom teaching.

Grading: Ugrd Steinhardt Graded**Repeatable for additional credit:** No