

# MASTER OF ARTS IN MATHEMATICS TEACHING

## Overview and Contact Information

The Master of Arts in Mathematics Teaching program (M.A.M.T.), offered through Mount Holyoke College's Mathematics Leadership Programs, is designed for teachers, teacher-leaders, and math coaches of grades K– 8 who have a teaching license (initial or professional) and at least a bachelor degree. The program is designed for educators looking to strengthen their skills as math teachers or develop their professional credentials in order to become qualified as math specialists.

Upon successful completion of the program, students are awarded the Master of Arts in Teaching degree.

### Contact Information

Michael Flynn, Director

Janet Paquette, Senior Administrative Assistant

413-538-2063

<http://mathleadership.org/programs/master-of-arts-in-mathematics-teaching/>

## Curriculum and Requirements

This 32-credit program is built around the latest research and best practices in math education. The core component of the work is the Developing Mathematical Ideas curriculum. The two-and-a-half-year program involves three intensive summer sessions (three weeks each, except the final summer of two weeks) and two academic years of online work.

Each summer will consist of three weeks of courses, two focused on mathematics and one focused on educational leadership. The final summer will consist of one week of mathematics and one week of educational leadership. Students may attend in person on our beautiful campus at Mount Holyoke College or online through our virtual leaning environment during the summer sessions.

Each academic year will include four credits of mathematics work and four credits of educational leadership, all conducted online. The academic year online courses blend asynchronous assignments with live virtual learning sessions. During the virtual learning sessions, participants have the option to attend in person on campus.

### Summer (On-Campus or Online)

X.MATH-400	Developing Mathematical Ideas: Building a System of Tens	2
X.MATH-401	Developing Mathematical Ideas: Making Meaning for Operations	2
X.MTHED-422	Research on Learning: Implementing the Common Core Math Practice Standards	2

### Academic Year (Online)

X.MATH-407	Reasoning Algebraically About Operations	4
X.MTHED-407	Reasoning Algebraically About Operations	2
X.MTHED-465	Action Research on Learning and Teaching	2

### Summer (On-Campus or Online)

X.MATH-405	Developing Mathematical Ideas: Measuring Space in One, Two, and Three Dimensions	2
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X.MTHED-408	Educational Leadership I: Coaching and Mentoring	2
X.MATH-402	Developing Mathematical Ideas: Examining Features of Shape	2

### Academic Year (Online)

X.MATH-460	Connecting Arithmetic to Algebra	4
X.MTHED-460	Connecting Arithmetic/Algebra Leadership	2
X.MTHED-466	Action Research on Coaching and Mentoring	2

### Summer (On-Campus or Online)

X.MATH-406	Developing Mathematical Ideas: Patterns, Functions, and Change	2
X.MTHED-410	Educational Leadership II: Facilitating Professional Development	2

Total Credits	32
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Teachers, teacher-leaders, and math coaches of grades K– 8 who wish to apply must have a teaching license (initial or professional) and at least a bachelor degree. Apply for the program online (<http://mathleadership.org/programs/master-of-arts-in-mathematics-teaching>).

To secure their place in the program, admitted applicants will pay a non-refundable \$300 deposit which will be applied as a credit to their first term's bill.

In total, the M.A.M.T. program is based on 16 credits of synchronous summer sessions (on-campus or online) and 16 credits of online work completed during the academic year for a total of 32 credits. Total cost of the program is \$24,500.

The tuition for the complete program is broken into five billing cycles over the two and a half years.

When	Bill Amount
June for Summer	\$4,324
July for Fall	\$5,765
June for Summer	\$4,324
July for Fall	\$5,765
June for Summer	\$4,322
Total Tuition	\$24,500

M.A.M.T. students who elect additional courses will pay each course's per-course fee.

For refund schedules and information, please consult the Refund Policies for all M.A.T. Degree Programs section of the PaGE Financial Policies page (<http://catalog.mtholyoke.edu/PaGE/financial-policies>).

Mount Holyoke's Office of Student Financial Services works closely with M.A.M.T. students to ensure that they are aware of the different financing options available to best suit their individual needs.

Please see Financial Aid for all M.A.T. Degree Programs (<http://catalog.mtholyoke.edu/PaGE/financial-policies>) for further details.

## Scholarships

Mount Holyoke College offers \$10,000 Emerging Teacher Leader Scholarships for K-8 teachers and coaches that are invested in the learning and teaching of mathematics and are interested in developing their leadership potential, and Distinguished Teacher Leaders Scholarships for State Teachers of the Year and recipients of the Presidential Award for Excellence in Mathematics and Science Teaching.

The scholarships will assist with the tuition toward our Master of Arts in Mathematics Teaching (MAMT) program beginning in July. The scholarship funds are awarded across all five billing cycles, reducing each tuition bill by \$2,000.

The scholarship application is embedded in the MAMT application in the form of an essay. Scholarships are issued on a rolling basis at the end of each month beginning in January until all the funds are awarded. Interested applicants are strongly encouraged to apply early to ensure the availability of scholarship funds.

## Loans and Loan Forgiveness

Please see Financial Aid for all M.A.T. Degree Programs (<http://catalog.mtholyoke.edu/PaGE/financial-policies>) for further details.

## National Council of Teachers of Mathematics Education Trust

The Mathematics Education Trust (MET) was established in 1976 to channel the generosity of contributors through the creation and funding of grants, awards, honors, and other projects that support the improvement of mathematics teaching and learning. For more information, visit the MET website (<http://www.nctm.org/MET>).

## Mathematics

### X.MATH-400 Developing Mathematical Ideas: Building a System of Tens

*Credits: 2*

Participants will explore the base-ten structure of the number system, consider how that structure is exploited in multi-digit computational procedures, and examine how basic concepts of whole numbers reappear when working with decimals. They will study the various ways children naturally tend to think about separating and combining numbers and what children must understand in order to work with numbers in these ways.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, S. Bent, M. Flynn*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

### X.MATH-401 Developing Mathematical Ideas: Making Meaning for Operations

*Spring. Credits: 2*

This course provides opportunities for participants to examine the actions and situations modeled by the four basic operations. The course will begin with a view of young children's counting strategies as they encounter word problems, moves to an examination of the four basic operations on whole numbers, and revisits the operations in the context of rational numbers.

*Applies to requirement(s): Meets No Distribution Requirement*

*M. Flynn*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

### X.MATH-402 Developing Mathematical Ideas: Examining Features of Shape

*Credits: 2*

Participants examine aspects of two-dimensional and three-dimensional shapes, develop geometric vocabulary, and explore both definitions and properties of geometric objects. The seminar includes a study of angle, similarity, congruence, and the relationships between three-dimensional objects and their two-dimensional representations. Participants examine how students develop these concepts through analyzing print and video cases as well as reading and discussing research articles.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Flynn*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Instructor permission required.*

*Notes: Section 01 for MAMT students. Section 02 for non-matriculated students. Half semester.*

### X.MATH-404 Developing Mathematical Ideas: Working With Data

*Credits: 2*

Participants will work with the collection, representation, description, and interpretation of data. They will learn what various graphs and statistical measures show about features of the data, study how to summarize data when comparing groups, and consider whether the data provides insight into the questions that led to data collection.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Riddle*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

### X.MATH-405 Developing Mathematical Ideas: Measuring Space in One, Two, and Three Dimensions

*Credits: 2*

Participants will examine different aspects of size, develop facility in composing and decomposing shapes, and apply these skills to make sense of formulas for area and volume. They will also explore conceptual issues of length, area, and volume, as well as their complex interrelationships.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Flynn, A. O'Reilly, S. Smith*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Notes: Section 01 for MAMT students. Section 02 for non-matriculated students. Half semester.*

### X.MATH-406 Developing Mathematical Ideas: Patterns, Functions, and Change

*Not Scheduled for This Year. Credits: 2*

Participants discover how the study of repeating patterns and number sequences can lead to ideas of functions, learn how to read tables and graphs to interpret phenomena of change, and use algebraic notation to write function rules. With a particular emphasis on linear functions, participants also explore quadratic and exponential functions and examine how various features of a function are seen in graphs, tables, or rules. Participants examine how students develop these concepts through analyzing print and video cases as well as reading and discussing research articles.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Flynn*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Instructor permission required.*

**X.MATH-407 Reasoning Algebraically About Operations**

*Not Scheduled for This Year. Credits: 1*

Participants examine generalizations at the heart of the study of operations in the elementary grades. They express these generalizations in common language and in algebraic notation, develop arguments based on representations of the operations, study what it means to prove a generalization, and extend their generalizations and arguments when the domain under consideration expands from whole numbers to integers.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Flynn*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Instructor permission required.*

**X.MATH-460 Connecting Arithmetic to Algebra**

*Not Scheduled for This Year. Credits: 3*

Connecting Arithmetic to Algebra (CAA) is a year-long professional development experience in which teachers consider generalizations that arise from the study of number and operations in grades 1 through 7. They examine cases of students who are engaged in the process of articulating general claims, working to understand those claims, and learning how to prove them. The course also focuses on how this approach to mathematical thinking supports a range of mathematics learners, including those who have difficulty with grade-level mathematics and those who need additional challenge.

*Applies to requirement(s): Meets No Distribution Requirement*

*M. Flynn, The department*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Instructor permission required.*

*Coreq: X.MTHED-460.*

*Notes: This is a year-long online course. At the conclusion of the 2-semester sequence, final letter grades will be awarded for both segments of the sequence.*

**X.MATH-462 Fostering Algebraic Reasoning**

*Fall and Spring. Credits: 3*

Enrolled students examine generalizations at the heart of the study of operations in the elementary grades. They express these generalizations in common language and in algebraic notation, develop arguments based on representations of the operations, study what it means to prove a generalization, and extend their generalizations and arguments when the domain under consideration expands from whole numbers to integers. In addition, they investigate the thinking of their own students working on similar ideas by recording and analyzing their own lessons and interviews with their students. Examination of the links between Common Core Math Practice Standards is also included.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Flynn*

*Restrictions: This course is offered for graduate students only.*

*Notes: This is a year-long online course. At the conclusion of the 2-semester sequence, final letter grades will be awarded for both segments of the sequence.*

## Mathematics Education

**X.MTHED-404 Effective Practices for Advancing the Teaching and Learning of Mathematics**

*Spring. Credits: 2*

The National Council of Teachers of Mathematics identified eight practices for effective teaching of mathematics and teacher leaders from around the country have been working to develop innovative ways to implement these practices in K-12 classrooms. Each live online session will explore a different practice in depth with one of the teacher leaders that designed it. Participants will then work to implement the practice in their own classrooms and analyze how it affects student learning. The live sessions will involve working through mathematical tasks, analyzing student thinking and effective instructional methodologies, and engaging in discussions with colleagues from around the country.

*Applies to requirement(s): Meets No Distribution Requirement*

*M. Flynn*

*Restrictions: This course is offered for graduate students only.*

**X.MTHED-407 Reasoning Algebraically About Operations**

*Not Scheduled for This Year. Credits: 1*

Participants examine generalizations at the heart of the study of operations in the elementary grades. They express these generalizations in common language and in algebraic notation, develop arguments based on representations of the operations, study what it means to prove a generalization, and extend their generalizations and arguments when the domain under consideration expands from whole numbers to integers.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Flynn*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Instructor permission required.*

**X.MTHED-408 Educational Leadership I: Coaching and Mentoring**

*Credits: 2*

This course is designed for elementary math specialists with responsibilities for supporting teachers in the development of strong mathematics education programs. Participants explore issues related to: learning mathematics while in the context of teaching; facilitating the professional development of colleagues; teachers' and students' ideas about mathematics and learning; and fostering a stance of collaborative investigation. By way of a central theme of mathematics learning, the institute will offer coaches opportunities to explore, through the coaching perspective, ideas of number and geometry in the elementary grades.

*Applies to requirement(s): Meets No Distribution Requirement*

*M. Flynn, P. Wagner*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

**X.MTHED-410 Educational Leadership II: Facilitating Professional Development***Credits: 2*

This institute focuses on learning to teach one of the Developmental Mathematical Ideas (DMI) modules. Participants will choose a particular DMI module on which to concentrate their facilitation work. The institute will include examination of the central mathematical ideas of the module, identifying key goals for each session, discussion of the process of interacting with participants both in the institute sessions and through written responses, as well as opportunities for practice facilitation.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Flynn*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Advisory: Prior experience with a DMI seminar recommended.*

**X.MTHED-412 Mathematics Coaching: Designing Effective Professional Development***Not Scheduled for This Year. Credits: 3*

This course provides opportunities for math specialists/coaches of grades K-8 to design, develop, critique, implement, give, and receive feedback on mathematics professional development experiences that align with the Common Core standards and the particular needs of the school/district's participating staff. Topics include staying focused on mathematics while developing collaborative relationships, communicating with teachers and administrators, developing leadership skills, and continuing to be a learner. Emphasis will be placed on learning how to move a school and/or district toward their mathematics goals by providing both support and press for teachers who teach mathematics.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Flynn*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Advisory: Prior experience with a DMI seminar recommended.*

**X.MTHED-422 Research on Learning: Implementing the Common Core Math Practice Standards***Credits: 2*

This course is focused on implementing mathematics instruction to support the development of conceptual understandings of mathematics. Topics include creating a classroom climate for productive mathematics discussion, posing open-ended math tasks, asking probing questions, and exploring teacher moves that both challenge and support individual student learning. Analyzing classroom cases of practice will be a key feature.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Flynn*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Advisory: Prior experience with a DMI seminar recommended.*

**X.MTHED-460 Connecting Arithmetic/Algebra Leadership***Not Scheduled for This Year. Credits: 1*

Connecting Arithmetic to Algebra (CAA) is a professional development experience in which teachers consider generalizations that arise from the study of number and operations in grades 1 through 7. They examine cases of students who are engaged in the process of articulating general claims, working to understand those claims, and learning how to prove them. The course also focuses on how this approach to mathematical thinking supports a range of mathematics learners, including those who have difficulty with grade-level mathematics and those who need additional challenge.

*Applies to requirement(s): Meets No Distribution Requirement*

*The department*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Coreq: X.MATH-460.*

*Notes: This is a year-long online course. At the conclusion of the 2-semester sequence, final letter grades will be awarded for both segments of the sequence.*

**X.MTHED-462 Fostering Algebraic Reasoning***Fall and Spring. Credits: 1*

Enrolled students examine generalizations at the heart of the study of operations in the elementary grades. They express these generalizations in common language and in algebraic notation, develop arguments based on representations of the operations, study what it means to prove a generalization, and extend their generalizations and arguments when the domain under consideration expands from whole numbers to integers. In addition, they investigate the thinking of their own students working on similar ideas by recording and analyzing their own lessons and interviews with their students. Examination of the links between Common Core Math Practice Standards is also included.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Flynn*

*Restrictions: This course is offered for graduate students only.*

*Notes: This is a year-long online course. At the conclusion of the 2-semester sequence, final letter grades will be awarded for both segments of the sequence.*

**X.MTHED-465 Action Research on Learning and Teaching***Spring. Credits: 2*

This course will include action research on the mathematics learning of students and pedagogical moves of teachers. Participants will produce written cases of practice based on audio or videotaped classroom discussions and interviews with their own students. Participants will analyze their own cases and those of their colleagues to examine the learning of students and the impact of teacher moves. Course instructors will also provide individual feedback based on the classroom cases.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Flynn*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Notes: Online.*

**X.MTHED-466 Action Research on Coaching and Mentoring**

*Spring. Credits: 2*

This course will include action research on the impact of mathematics coaching or mentoring. Through a practicum experience each participant will engage with a colleague or group of colleagues, taking on a coaching role. These coaching or mentoring activities will be analyzed and shared with other course participants. Participants will produce written cases of math coaching practice based on audio or videotaped math coaching or mentoring sessions. Participants will analyze their own cases and those of their colleagues to examine the impact of coaching moves. Course instructors will also provide individual feedback on the coaching cases.

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable, M. Flynn*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Advisory: X.MATH-408 is recommended but not required.*

*Notes: Online.*

**X.MTHED-472 Research Into Classroom Routines**

*Not Scheduled for This Year. Credits: 2*

*Applies to requirement(s): Meets No Distribution Requirement*

*V. Bastable*

*Restrictions: This course is limited to Mount Holyoke MTHTE.MAT students only*

*Prereq: X.MATH-460.*