

MATHEMATICS (BS)

Exploration and Discovery

The general purpose of this degree is to provide a program of study in mathematics fostering general mathematical reasoning and the development of the mathematical tools needed for success. Students wishing to pursue a career as a certified mathematics teacher should choose either the Middle School Teacher Certification or Secondary Teacher Certification option.

Degree Requirements

| Course | Title | Credits |
|--|---|---------|
| Major Requirements | | |
| MA 2400 | Introduction to Formal Mathematics | 3 |
| MA 2700 | Logic, Proofs, and Axiomatic Systems (WRCO) | 3 |
| MA 3500 | Probability and Statistics for Scientists | 3 |
| General Education (https://coursecatalog.plymouth.edu/general-education) | | |
| EN 1400 | Composition | 4 |
| IS 1111 | The First Year Seminar: Critical Thinking and the Nature of Inquiry | 3 |
| CTDI | Creative Thought Direction | 3-4 |
| PPDI | Past and Present Direction | 3-4 |
| SIDI | Scientific Inquiry Direction | 3-4 |
| SSDI | Self and Society Direction | 3-4 |
| Directions (choose from CTDI, PPDI, SIDI, SSDI) ¹ | | 4-8 |
| Option Requirements | | |
| Complete one from the following required options: | | 78-90 |
| Mathematics Option | | |
| Middle School Teacher Certification (5-8) Option | | |
| Secondary Teacher Certification (7-12) Option | | |
| Total Credits | | 120 |

¹ Directions should total 20 credits (unless the major has a waiver for a specific Direction).

Mathematics Option of BS Mathematics

| Course | Title | Credits |
|---|------------------------------------|---------|
| MA 2550 | Calculus I (QRCO) | 4 |
| MA 2560 | Calculus II (QRCO) | 4 |
| MA 3120 | Linear Algebra | 3 |
| MA 3510 | Differential Equations | 3 |
| MA 3540 | Calculus III | 4 |
| MA 4140 | Abstract Algebra (WRCO) | 3 |
| MA 4430 | Numerical Analysis (TECO) | 3 |
| MA 4510 | Introduction to Analysis | 3 |
| Mathematics Electives | | |
| Complete 12 credits from the following: | | 12 |
| MA 3130 | Directed Research in Mathematics | |
| MA 3200 | Discrete Mathematics | |
| MA 3230 | College Geometries (TECO,WRCO) | |
| MA 3280 | Regression Analysis | |
| MA 3460 | History of Mathematics (GACO,WRCO) | |

| | | |
|--|-------------------------------|-------|
| MA 4220 | Topics in Mathematics | |
| MA 4350 | Probability Theory | |
| Computer Science Electives | | |
| Complete two courses from the following: | | 5-7 |
| CS 2010 | Computing Fundamentals (TECO) | |
| CS 2370 | Introduction to Programming | |
| CS 2400 | Scientific Programming | |
| CS 2470 | Systems Programming in C/C++ | |
| General Education (https://coursecatalog.plymouth.edu/general-education) | | |
| DICO | Diversity Connection | 3-4 |
| GACO | Global Awareness Connection | 3-4 |
| INCO | Integration Connection | 3-4 |
| WECO | Wellness Connection | 3-4 |
| Electives | | 22-28 |
| Total Credits | | 78-90 |

Students must receive a grade of C or better in all MA courses required in their degree program. A grade of C or better must be earned in any MA prerequisite course before enrolling in the post-requisite course.

Middle School Teacher Certification (5-8) Option of BS Mathematics

This Option leads to certification to teach mathematics in the public schools. The Educator Preparation programs at Plymouth State University are approved by the New Hampshire Department of Education. The University is a member of the American Association of Colleges of Teacher Education (AACTE). Graduates who complete this Teacher Certification Option are eligible for 5-8 teacher certification in the state of New Hampshire upon successful completion of the Middle School Mathematics Praxis Test. Because of New Hampshire's membership in the Interstate Certification Contract, Plymouth graduates are eligible to earn a certificate or license in another Contract state upon application to that state's department of education. For further information, please see the Holmes Center for School Partnerships and Educator Preparation. Requirements for certification may change, subject to changes made by the New Hampshire Department of Education. Teacher candidates can find the most current New Hampshire Department of Education standards at education.nh.gov/index.htm (<http://education.nh.gov>).

All teacher candidates who interact with students in public school settings through course-related field experiences, including Internship in Mathematics Teaching, are subject to New Hampshire state legislation that requires a full disclosure criminal records check. This may include fingerprinting. The processing of the criminal records check is conducted at the site school before the clinical experience begins. The fee for this processing is the responsibility of the teacher candidate and is paid directly to the school district. Each new site will require a separate fingerprinting and background check. Inquiries should be directed to the Holmes Center for School Partnerships and Educator Preparation.

In order for teacher candidates to participate in clinical experiences in diverse settings that are essential for their development as teachers and required for accreditation, teacher candidates must be willing and able to travel outside of the Plymouth area beyond walking distances. All Internship in Teaching candidates should plan for and be able to secure their own transportation by the junior year.

| Course | Title | Credits |
|--|---|---------|
| MA | Mathematics electives (not MADI) ¹ | 6-8 |
| MA 2120 | Mathematics for Grades 4-6 Educators (QRCO) | 4 |
| MA 3050 | Introduction to Mathematics Education | 3 |
| MA 3230 | College Geometries (TECO,WRCO) | 4 |
| MA 3460 | History of Mathematics (GACO,WRCO) | 3 |
| MA 4020 | The Cultural and Psychological Aspects of Mathematics Learning (DICO,INCO) | 3 |
| MA 4040 | Teaching and Learning Mathematics for Secondary and Middle School | 3 |
| MA 4965 | Internship in Mathematics Teaching (5-8) ² | 12 |
| MA 4985 | Internship in Mathematics Teaching Seminar | 1 |
| CD 3000 | Philosophical and Historical Perspectives on the Child in Society (INCO,WRCO) | 3 |
| ED 2350 | Child and Youth Health and Development in Context (WECO) | 3 |
| ED 3350 | Classroom Planning, Management, and Organization for Middle School and Secondary Educators (TECO) | 3 |
| SE 3090 | Introduction to Special Education: Middle and Secondary | 3 |
| General Education (https://coursecatalog.plymouth.edu/general-education) | | |
| Electives | | 23-25 |
| Calculus | | |
| Complete one sequence from the following: | | 8 |
| MA 2490 & MA 2500 | Applied Calculus I (QRCO) and Applied Calculus II (QRCO) | |
| MA 2550 & MA 2560 | Calculus I (QRCO) and Calculus II (QRCO) | |
| Total Credits | | 82-86 |

¹ MA 2110 or higher

² Internship in Mathematics Teaching requires a minimum cumulative grade point average of 2.50.

Students must receive a grade of C or better in all MA courses required in their degree program. A grade of C or better must be earned in any MA prerequisite course before enrolling in the post-requisite course.

Secondary Teacher Certification (7-12) Option of BS Mathematics

This Option leads to certification to teach mathematics in the public schools. The Educator Preparation programs at Plymouth State University are approved by the New Hampshire Department of Education. The University is a member of the American Association of Colleges of Teacher Education (AACTE). Graduates who complete this Teacher Certification Option are eligible for 7-12 teacher certification in the state of New Hampshire upon successful completion of the Secondary Mathematics: Content Knowledge Praxis Test. Because of New Hampshire's membership in the Interstate Certification Contract, Plymouth graduates are eligible to earn a certificate or license in another Contract state upon application to that state's department of education. For further information, please see the Holmes Center for School Partnerships and Educator Preparation section. Requirements for certification may change, subject to changes made by the New Hampshire Department of Education. Teacher candidates can find the

most current New Hampshire Department of Education standards at education.nh.gov/index.htm (<http://education.nh.gov>).

All teacher candidates who interact with students in public school settings through course-related field experiences, including Internship in Mathematics Teaching, are subject to New Hampshire state legislation that requires a full disclosure criminal records check. This may include fingerprinting. The processing of the criminal records check is conducted at the site school before the clinical experience begins. The fee for this processing is the responsibility of the teacher candidate and is paid directly to the school district. Each new site will require a separate fingerprinting and background check. Inquiries should be directed to the Holmes Center for School Partnerships and Educator Preparation.

In order for teacher candidates to participate in clinical experiences in diverse settings that are essential for their development as teachers and required for accreditation, teacher candidates must be willing and able to travel outside of the Plymouth area beyond walking distances. All Internship in Teaching candidates should plan for and be able to secure their own transportation by the junior year.

| Course | Title | Credits |
|--|---|---------|
| MA 2550 | Calculus I (QRCO) | 4 |
| MA 2560 | Calculus II (QRCO) | 4 |
| MA 3050 | Introduction to Mathematics Education | 3 |
| MA 3120 | Linear Algebra | 3 |
| MA 3230 | College Geometries (TECO,WRCO) | 4 |
| MA 3460 | History of Mathematics (GACO,WRCO) | 3 |
| MA 3540 | Calculus III | 4 |
| MA 4020 | The Cultural and Psychological Aspects of Mathematics Learning (DICO,INCO) | 3 |
| MA 4040 | Teaching and Learning Mathematics for Secondary and Middle School | 3 |
| MA 4140 | Abstract Algebra (WRCO) | 3 |
| MA 4975 | Internship in Mathematics Teaching (7-12) ¹ | 12 |
| MA 4985 | Internship in Mathematics Teaching Seminar | 1 |
| CD 3000 | Philosophical and Historical Perspectives on the Child in Society (INCO,WRCO) | 3 |
| ED 2350 | Child and Youth Health and Development in Context (WECO) | 3 |
| ED 3350 | Classroom Planning, Management, and Organization for Middle School and Secondary Educators (TECO) | 3 |
| SE 3090 | Introduction to Special Education: Middle and Secondary | 3 |
| General Education (https://coursecatalog.plymouth.edu/general-education) | | |
| Electives | | 25 |
| Total Credits | | 84 |

¹ Internship in Mathematics Teaching requires a minimum cumulative grade point average of 2.50.

Students must receive a grade of C or better in all MA courses required in their degree program. A grade of C or better must be earned in any MA prerequisite course before enrolling in the post-requisite course.

Recommended Course Sequence Required Options in this Major

Complete one option

Mathematics Option of BS Mathematics

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

| Course | Title | Credits |
|--|---|---------------|
| Year One | | |
| EN 1400 | Composition | 4 |
| IS 1111 | The First Year Seminar: Critical Thinking and the Nature of Inquiry | 3 |
| MA 2400 | Introduction to Formal Mathematics | 3 |
| MA 2550 | Calculus I (QRCO) ¹ | 4 |
| MA 2560 | Calculus II (QRCO) ¹ | 4 |
| MA 2700 | Logic, Proofs, and Axiomatic Systems (WRCO) | 3 |
| CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI) | Creative Thought Direction | 3-4 |
| PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI) | Past and Present Direction | 3-4 |
| Elective | | 1-3 |
| | | Credits 28-32 |
| Year Two | | |
| MA 3540 | Calculus III ¹ | 4 |
| Complete one Mathematics Elective from the following: ¹ | | 3 |
| MA 3130 | Directed Research in Mathematics | |
| MA 3200 | Discrete Mathematics | |
| MA 3230 | College Geometries (TECO,WRCO) | |
| MA 3280 | Regression Analysis | |
| MA 3460 | History of Mathematics (GACO,WRCO) | |
| MA 4220 | Topics in Mathematics | |
| MA 4350 | Probability Theory | |
| Complete two Computer Science Electives from the following: ¹ | | 5-7 |
| CS 2010 | Computing Fundamentals (TECO) | |
| CS 2370 | Introduction to Programming | |
| CS 2400 | Scientific Programming | |
| CS 2470 | Systems Programming in C/C++ | |
| SIDI (https://coursecatalog.plymouth.edu/general-education/#SIDI) | Scientific Inquiry Direction | 3-4 |
| SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI) | Self and Society Direction | 3-4 |
| Directions (choose from CTDI, PPDI, SIDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) ² | | 4-8 |

| | | |
|--|---|---------------|
| DICO (https://coursecatalog.plymouth.edu/general-education/#DICO) | Diversity Connection ¹ | 3-4 |
| Elective | | 0-1 |
| | | Credits 25-35 |
| Year Three | | |
| MA 3120 | Linear Algebra ¹ | 3 |
| MA 3500 | Probability and Statistics for Scientists | 3 |
| MA 3510 | Differential Equations ¹ | 3 |
| MA 4140 | Abstract Algebra (WRCO) ¹ | 3 |
| MA 4510 | Introduction to Analysis ¹ | 3 |
| Complete one Mathematics Elective from the following: ¹ | | 3 |
| MA 3130 | Directed Research in Mathematics | |
| MA 3200 | Discrete Mathematics | |
| MA 3230 | College Geometries (TECO,WRCO) | |
| MA 3280 | Regression Analysis | |
| MA 3460 | History of Mathematics (GACO,WRCO) | |
| MA 4220 | Topics in Mathematics | |
| MA 4350 | Probability Theory | |
| GACO (https://coursecatalog.plymouth.edu/general-education/#GACO) | Global Awareness Connection ¹ | 3-4 |
| Electives | | 8-9 |
| | | Credits 29-31 |
| Year Four | | |
| MA 4430 | Numerical Analysis (TECO) ¹ | 3 |
| Complete two Mathematics Electives from the following: ¹ | | 6 |
| MA 3130 | Directed Research in Mathematics | |
| MA 3200 | Discrete Mathematics | |
| MA 3230 | College Geometries (TECO,WRCO) | |
| MA 3280 | Regression Analysis | |
| MA 3460 | History of Mathematics (GACO,WRCO) | |
| MA 4220 | Topics in Mathematics | |
| MA 4350 | Probability Theory | |
| INCO (https://coursecatalog.plymouth.edu/general-education/#INCO) | Integration Connection ¹ | 3-4 |
| WECO (https://coursecatalog.plymouth.edu/general-education/#WECO) | Wellness Connection ¹ | 3-4 |
| Electives | | 13-15 |
| | | Credits 28-32 |
| Total Credits | | 120 |

¹ Required for the Option

² Directions should total 20 credits (unless the major has a waiver for a specific Direction).

Middle School Teacher Certification (5-8) Option of BS Mathematics

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

| Course | Title | Credits |
|--|--|---------|
| Year One | | |
| EN 1400 | Composition | 4 |
| IS 1111 | The First Year Seminar: Critical Thinking and the Nature of Inquiry | 3 |
| MA | Mathematics Elective (not MADI) ^{1,2} | 3-4 |
| MA 2400 | Introduction to Formal Mathematics | 3 |
| Complete one Calculus Sequence from the following: ² | | 8 |
| MA 2490 & MA 2500 | Applied Calculus I (QRCO) and Applied Calculus II (QRCO) | |
| MA 2550 & MA 2560 | Calculus I (QRCO) and Calculus II (QRCO) | |
| MA 2700 | Logic, Proofs, and Axiomatic Systems (WRCO) | 3 |
| CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI) | Creative Thought Direction | 3-4 |
| Elective | | 1-3 |
| Credits | | 28-32 |
| Year Two | | |
| MA 2120 | Mathematics for Grades 4-6 Educators (QRCO) ² | 4 |
| MA 3050 | Introduction to Mathematics Education ² | 3 |
| MA 3230 | College Geometries (TECO,WRCO) ² | 4 |
| ED 2350 | Child and Youth Health and Development in Context (WECO) ² | 3 |
| PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI) | Past and Present Direction | 3-4 |
| SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI) | Self and Society Direction | 3-4 |
| Directions (choose from CTDI, PPDI, SIDI, SSDI) (https://coursecatalog.plymouth.edu/general-education) ³ | | 4-8 |
| Elective | | 2-4 |
| Credits | | 26-34 |
| Year Three | | |
| MA 3460 | History of Mathematics (GACO,WRCO) ² | 3 |
| MA 3500 | Probability and Statistics for Scientists | 3 |
| MA 4020 | The Cultural and Psychological Aspects of Mathematics Learning (DICO,INCO) ² | 3 |
| MA 4040 | Teaching and Learning Mathematics for Secondary and Middle School ² | 3 |
| CD 3000 | Philosophical and Historical Perspectives on the Child in Society (INCO,WRCO) ² | 3 |
| ED 3350 | Classroom Planning, Management, and Organization for Middle School and Secondary Educators (TECO) ² | 3 |

| | | |
|--|--|-------|
| SE 3090 | Introduction to Special Education: Middle and Secondary ² | 3 |
| SIDI (https://coursecatalog.plymouth.edu/general-education/#SIDI) | Scientific Inquiry Direction | 3-4 |
| Elective | | 5-6 |
| Credits | | 29-31 |
| Year Four | | |
| MA 4965 | Internship in Mathematics Teaching (5-8) ² | 12 |
| MA 4985 | Internship in Mathematics Teaching Seminar ² | 1 |
| MA | Mathematics Elective (not MADI) ^{1,2} | 3-4 |
| Electives | | 13-14 |
| Credits | | 29-31 |
| Total Credits | | 120 |

¹ MA 2110 or higher

² Required for the Option

³ Directions should total 20 credits (unless the major has a waiver for a specific Direction).

Secondary Teacher Certification (7-12) Option of BS Mathematics

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

| Course | Title | Credits |
|--|---|---------|
| Year One | | |
| EN 1400 | Composition | 4 |
| IS 1111 | The First Year Seminar: Critical Thinking and the Nature of Inquiry | 3 |
| MA 2400 | Introduction to Formal Mathematics | 3 |
| MA 2550 | Calculus I (QRCO) ¹ | 4 |
| MA 2560 | Calculus II (QRCO) ¹ | 4 |
| MA 2700 | Logic, Proofs, and Axiomatic Systems (WRCO) | 3 |
| CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI) | Creative Thought Direction | 3-4 |
| PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI) | Past and Present Direction | 3-4 |
| Elective | | 1-3 |
| Credits | | 28-32 |
| Year Two | | |
| MA 3050 | Introduction to Mathematics Education ¹ | 3 |
| MA 3230 | College Geometries (TECO,WRCO) ¹ | 4 |
| MA 3540 | Calculus III ¹ | 4 |
| ED 2350 | Child and Youth Health and Development in Context (WECO) ¹ | 3 |

| | | |
|---|------------------------------|-------|
| SIDI (https://coursecatalog.plymouth.edu/general-education/#SIDI) | Scientific Inquiry Direction | 3-4 |
| SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI) | Self and Society Direction | 3-4 |
| Directions (choose from CTDI, PPD, SIDI, SSDI) (https://coursecatalog.plymouth.edu/general-education) ² | | 4-8 |
| Elective | | 2-4 |
| Credits | | 26-34 |

Year Three

| | | |
|-----------|--|----|
| MA 3120 | Linear Algebra ¹ | 3 |
| MA 3460 | History of Mathematics (GACO,WRCO) ¹ | 3 |
| MA 3500 | Probability and Statistics for Scientists | 3 |
| MA 4020 | The Cultural and Psychological Aspects of Mathematics Learning (DICO,INCO) ¹ | 3 |
| MA 4040 | Teaching and Learning Mathematics for Secondary and Middle School ¹ | 3 |
| CD 3000 | Philosophical and Historical Perspectives on the Child in Society (INCO,WRCO) ¹ | 3 |
| ED 3350 | Classroom Planning, Management, and Organization for Middle School and Secondary Educators (TECO) ¹ | 3 |
| SE 3090 | Introduction to Special Education: Middle and Secondary ¹ | 3 |
| Electives | | 6 |
| Credits | | 30 |

Year Four

| | | |
|---------------|---|-----|
| MA 4140 | Abstract Algebra (WRCO) ¹ | 3 |
| MA 4975 | Internship in Mathematics Teaching (7-12) ¹ | 12 |
| MA 4985 | Internship in Mathematics Teaching Seminar ¹ | 1 |
| Electives | | 14 |
| Credits | | 30 |
| Total Credits | | 120 |

¹ Required for the Option

² Directions should total 20 credits (unless the major has a waiver for a specific Direction).