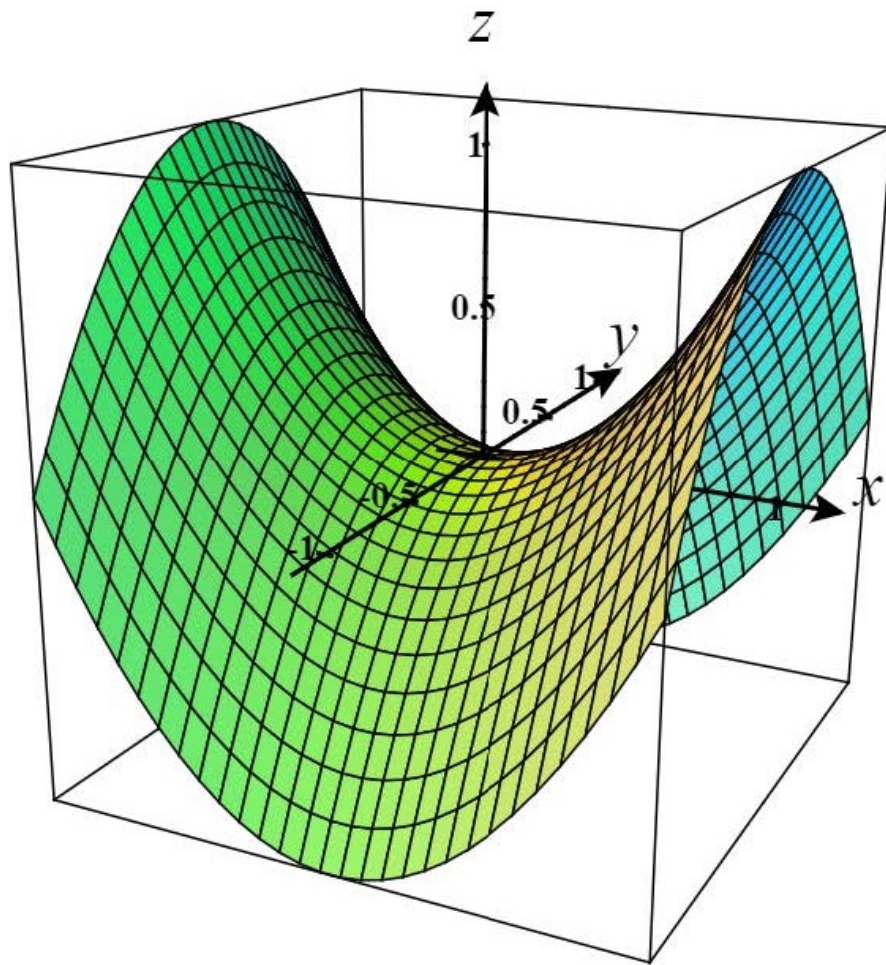


Framingham State University

Mathematics Department

Student Handbook



Academic Year: 2023 - 2024

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Welcome and Departmental Mission

A Word to the Mathematics Major

The Mathematics Department would like to welcome you as one of our majors. This planning guide is intended to help you in selecting your courses in their proper sequence and to give you direction in your overall program of study. You are not alone in this process. Although you are primarily responsible for your schedule, you will be assigned an advisor who can help answer questions you may have about the program and course selections. It is important to keep in mind that not all courses are offered every semester and some upper level courses are only offered on alternate years. It is also important to be sure you have satisfied the prerequisites for each course.

In addition to helping you with your program, this guide also identifies some opportunities offered by the Department such as Teaching Assistantships for upper-level mathematics majors who have a G.P.A. of at least 3.0. There is also an opportunity to do an internship in mathematics/statistics in order to gain real-world experience while earning course credit.

The top graduating senior mathematics major with a G.P.A. above 3.5 in mathematics is awarded the Frank Castagna Award for Excellence in Mathematics. There are other awards possible within the Department and the University.

The faculty is here to help you with any questions you may have. It is our hope that you will have a successful and rewarding experience at Framingham State University.

Congratulations on your choice of school and major.

Mission

The mission of the Mathematics Department is twofold. Firstly, we provide a strong, broad-based preparation in mathematics and its related skills to enable the student to select a variety of career paths in which the knowledge and intellectual skills of mathematics can be used. Secondly, we function as a service department to other programs on the campus.

The goals of the mathematics curriculum for the mathematics major will develop, in the student, competencies in analysis, algebra, probability and statistics, number theory, geometry, technology, and the history and applications of mathematics. It will also develop and enhance such relevant abilities as critical thinking, logical reasoning, problem solving, including intuition and rigor, modeling, and oral and written communication skills in mathematics.

The combination of the mathematics curriculum and general education portion of the University curriculum is such that the career paths open to the student are broad and varied from teaching, actuarial science, statistics, graduate studies, and more.

In order to carry out its mission, the Mathematics Department strives to meet the needs of a diverse campus and student body through periodic assessment of its course and program offerings. The faculty is committed to developing and improving students' problem solving and reasoning skills, as well as their mathematical knowledge, in order to prepare them to face the challenges of the twenty-first century. The department will continue to offer programs to meet the ever-changing needs of the students and the nation. Our continuing goal is the achievement of excellence and scholarship by all our students.

Mathematics Department Full-Time Faculty

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Program Requirements and Four-Year Plans

General Education Requirements

For information about the University's general education requirements, please consult the most recent University Catalog. Note that for mathematics majors who matriculated to Framingham State University Fall 2013 or later, General Education subdomain II-A is waived.

Mathematics Program Requirements

STAT 157	Probability and Statistics
MATH 206	Discrete Mathematics I
MATH 219	Calculus I
MATH 220	Calculus II
MATH 221	Calculus III
MATH 226	Linear Algebra
MATH 419	Abstract Algebra I
MATH 427	Real Analysis
	One Computer Science Course

In addition to those courses listed above, each student must complete the major requirements described below.

General Mathematics Program (UMAG)

Students enrolled in the UMAG program must complete five electives from the following list.

- MATH 222 Differential Equations
- Any MATH/STAT course at the 300-level or above

Minor in Secondary Education (UMAT)

Students enrolled in the UMAT program must complete MATH 317 Higher Geometry, MATH 322 History of Mathematics, and three electives from the following list.

- MATH 222 Differential Equations
- Any MATH/STAT course at the 300-level or above

It is important to note that middle school or high school student teaching occurs only in the Spring semester. Please see the University Catalog for additional information on teacher education programs.

In addition to the UMAG and UMAT programs, the mathematics department offers the following minors.

Mathematics Minor

- MATH 219 Calculus I
- One mathematics course at or above the 200-level or one of the following.
 - STAT 107 Business Statistics
 - STAT 117 Introduction to Statistics
 - STAT 157 Probability and Statistics
 - STAT 208 Biostatistics
- Three additional mathematics courses at or above the 200-level.

Minor in Mathematics for Elementary Education

- MATH 110 Mathematics for Elementary Educators I
- MATH 120 Mathematics for Elementary Educators II
- MATH 206 Discrete Mathematics I
- Three courses from the following list. At least one course must be at the 300-level.
 - MATH 219 Calculus I
 - MATH 220 Calculus II
 - MATH 226 Linear Algebra and Applications
 - MATH 301 Problem Solving and Modeling in Mathematics
 - MATH 310 Number Theory
 - MATH 317 Higher Geometry
 - MATH 322 History of Mathematics
 - MATH 322 History of Mathematics
 - STAT 117 Introduction to Statistics or STAT 157 Probability and Statistics

Statistics Minor

- One course from the following list.
 - ENVS 202 Data Analysis for Scientists
 - QUAN 202 Statistical Analysis for Business and Economics
 - STAT 107 Business Statistics
 - STAT 117 Introduction to Statistics
 - STAT 157 Probability and Statistics
 - STAT 208 Biostatistics
- STAT 307 Intermediate Statistics
- STAT 308 Applied Statistics Data Processing
- Two electives from the following list.
 - MATH 340 Probability Theory
 - MRKT 310 Marketing Research
 - MRKT 410 Advanced Marketing Research
 - PSYC 291 Psychology Research I: Descriptive and Correlational Methods
 - PSYC 391 Psychology Research II: Quasi-Experimental and Experimental Methods
 - QUAN 470 Applied Econometrics for Economics and Business
 - STAT 348 Mathematical Statistics I
 - STAT 349 Mathematical Statistics II
 - Any departmental approved internship*

*Any internship must be approved by both the home department and the Mathematics department.

No more than two course credits from a student's major home department may count towards both their major and the statistics minor.

Minor in Artificial Intelligence (interdepartmental minor with Computer Science)

- CSCI 130 Computer Science I Using Java OR
CSCI Python Programming for Applications
- CSCI 300 Artificial Intelligence
- MATH 219 Calculus I
- MATH 226 Linear Algebra and Applications
- One course from the following list:
 - CSCI 490 Independent Study in Computer Science
 - CSCI 495 Internship in Computer Science
 - DGHM 110 Introduction to Digital Humanities
 - ENVS 333 Digital Field Methods: Drone, Data, & Artificial Intelligence
 - MATH 490 Independent Study in Mathematics
 - MATH 495 Internship in Mathematics
 - PHIL 102 Introduction to Ethics: Why be Moral?
 - PSYC 236 Psychology of Learning
 - PSYC 263 Cognitive Psychology



FOUR-YEAR PROGRAM COMPLETION PLAN

Department of Mathematics

- Domain General Education courses and open electives may be taken in any semester and in any order, except for Common Core Domain requirements, which must be taken during Year One.
- Please refer to your Degree Audit for specific course requirements.

Recommended Schedule for Bachelor of Science: Majoring in Mathematics, Concentration in General Studies (UMAG):

Year One: Fall Semester	Year One: Spring Semester
STAT 157 Probability and Statistics	MATH 206 Discrete Mathematics I
MATH 219 Calculus I	MATH 220 Calculus II
ENWR 110 Composition II	Domain General Education Course
Domain General Education Course	Computer Science Course

Year Two: Fall Semester	Year Two: Spring Semester
MATH 226 Linear Algebra and Applications	MATH 221 Calculus III
Mathematics or Free Elective, or Minor Requirement	Mathematics or Free Elective, or Minor Requirement
Domain General Education Course	Domain General Education Course
Domain General Education Course	Domain General Education Course

Year Three: Fall Semester	Year Three: Spring Semester
Mathematics or Free Elective, or Minor Requirement	MATH 419 Abstract Algebra
Mathematics or Free Elective, or Minor Requirement	Mathematics or Free Elective, or Minor Requirement
Domain General Education Course	Mathematics or Free Elective, or Minor Requirement
Domain General Education Course	Domain General Education Course

Year Four: Fall Semester	Year Four: Spring Semester
MATH 427 Real Analysis	Mathematics or Free Elective, or Minor Requirement
Mathematics or Free Elective, or Minor Requirement	Mathematics or Free Elective, or Minor Requirement
Mathematics or Free Elective, or Minor Requirement	Mathematics or Free Elective, or Minor Requirement
Domain General Education Course	Mathematics or Free Elective, or Minor Requirement

Domain General Education Checklist:

- Domain II-A is fulfilled through completion of the major.
- Common Core: ___ A. ENGL 110 Expository Writing
 ___ B. MATH XXX (credit-bearing)
- Domain I: ___ A. Creative Arts
 ___ B. Humanities
 ___ C. Language
- Domain II: _X_ A. Analysis, Modeling, Problem Solving
 ___ B. Natural Sciences (two courses)
- Domain III: ___ A. Perspectives on the Past
 ___ B. Perspectives on Contemporary World
 ___ C. Global Competency, Ethical Reasoning, Human Diversity


FOUR-YEAR PROGRAM COMPLETION PLAN
Department of Mathematics

-- Domain General Education courses may be taken in any semester and in any order, except for Common Core Domain requirements, which must be taken during Year One.

--Please refer to your Degree Audit for specific course requirements.

Recommended Schedule for Bachelor of Science: Majoring in Mathematics, Minor in Secondary Education (UMAT):

Year One: Fall Semester	Year One: Spring Semester
STAT 157 Probability and Statistics	MATH 206 Discrete Mathematics I
MATH 219 Calculus I	MATH 220 Calculus II
ENWR 110 Composition II	Domain General Education Course
Domain General Education Course	Computer Science Course

Year Two: Fall Semester	Year Two: Spring Semester
MATH 226 Linear Algebra and Applications	MATH 221 Calculus III
EDUC 200 Education in American Society with Field Study I	MATH 317 Higher Geometry
PSYC 200 Psychology of Development	Domain General Education Course
Domain General Education Course	Domain General Education Course

Year Three: Fall Semester	Year Three: Spring Semester
MATH 322 History of Mathematics	MATH 419 Abstract Algebra I
Mathematics Elective (MATH 222 or 300-level)	Mathematics Elective (MATH 222 or 300-level)
EDUC 246 Sheltered English Immersion in Secondary Education	Domain General Education Course
Domain General Education Course	Domain General Education Course

Year Four: Fall Semester	Year Four: Spring Semester
MATH 427 Real Analysis	EDPS 423A Secondary Professional Practicum A: Mathematics 5-8 EDPS 423B Secondary Professional Practicum B: Mathematics 5-8
Mathematics Elective (MATH 222 or 300-level)	OR
EDIL 302 Secondary Methods with Field Study II: Special Needs and Educational Technology	EDPS 424A Secondary Professional Practicum A: Mathematics 8-12 EDPS 424B Secondary Professional Practicum B: Mathematics 8-12
EDIL 323 Secondary Methods with Field Study II: Mathematics 5-8/8-12	

Domain General Education Checklist:

- Domain II-A is fulfilled through completion of the major.

Common Core:	___	A. ENGL 110 Expository Writing
	___	B. MATH XXX (credit-bearing)
Domain I:	___	A. Creative Arts
	___	B. Humanities
	___	C. Language
Domain II:	<u> X </u>	A. Analysis, Modeling, Problem Solving
	___	B. Natural Sciences (two courses)
Domain III:	___	A. Perspectives on the Past
	___	B. Perspectives on Contemporary World
	___	C. Global Competency, Ethical Reasoning, Human Diversity

Career Opportunities in Mathematics

The goal of the mathematics major at Framingham State University is to prepare students for employment in the field of mathematics-related areas upon graduation. To this end, the Department has developed strong programs in the areas of pure and applied mathematics and education, as well as minor programs in both mathematics and statistics. The program also prepares students for graduate study in mathematics, applied mathematics, or statistics. Below are brief descriptions of some of the career opportunities available to graduates.

Teacher (Secondary)

Students selecting the teaching concentration will earn an initial license to teach either middle school or high school mathematics. Framingham State University has a rich tradition of preparing effective teachers and several opportunities are usually available for graduates. Should graduates consider a career change, the strong mathematics component of the curriculum makes it possible for them to move into positions in industry.

General Program

The General Mathematics program (UMAG) prepares students for a variety of areas in pure and applied mathematics and related fields. Some students choosing this option take courses that prepare them for careers in applied mathematics including work in technical, financial, and insurance companies. Students have pursued careers in statistics and actuarial science. In addition, many departments of the federal government employ mathematics graduates. In addition, the general option has sufficient latitude for students to earn minors in related areas such as physics, computer science, and business. Other students have chosen to concentrate on courses that prepare them for graduate school.

Additional Resources

The mathematical organizations, The Mathematical Association of America and The American Mathematical Society, have created websites that can be helpful to students who are considering careers in mathematics and/or graduate school. Some of those websites are listed below:

Careers:

www.maa.org/careers

Resources for Undergraduates Web Page:

www.ams.org/programs/students/undergrad/undergrad

Assistantships and Graduate Fellowships:

www.ams.org/programs/students/undergrad/asst.pdf

On Campus Jobs and Student Involvement

Mathematics Department Tutors

Interested students may apply to be a walk-in tutor through the Mathematics department. Tutoring takes place in the Hemenway 402 lounge. Tutors are responsible for material in all 100-level MATH/STAT courses, as well as MATH 206 Discrete Math I, MATH 219 Calculus I, and MATH 220 Calculus II.

Qualifying students must have at least sophomore standing, an overall GPA of at least 3.0, and a GPA of at least 3.0 in the major.

Interested students should see the department Chairperson.

Supplemental Instructors

Students may also be interested in applying to be a Supplemental Instruction (SI) Leader. Supplemental Instructors are assigned as a tutor to a specific section of a mathematics course. SI Leaders communicate with instructors, hold weekly tutoring hours, and periodically attend classes. Interested students may apply through the Center for Academic Success and Achievement (CASA).

Math Club

The Math Club is a student-led organization that periodically coordinates social gatherings, student and faculty presentations, and other events. Math Club membership is comprised of students from a variety of majors who have an interest in and appreciation for all things math-related.

Students who are interested in joining the Math Club or attending future events may contact Dr. Christopher Staniszewski.

Awards and Honors

Pi Mu Epsilon Massachusetts Xi Chapter

Pi Mu Epsilon is a national honor society dedicated to the promotion of mathematics and recognition of students who successfully pursue mathematical understanding. The Massachusetts Xi Chapter was established in May 2021.

Eligible students are those who are candidates for undergraduate degrees at FSU and who have met all of the following requirements.

1. Completed at least the equivalent of two semesters of calculus.
 - In practice, this means a student has credit for MATH 220 Calculus II.
 - Credit can be earned through courses at FSU, through AP credit, or through transfer credit.
2. Completed four additional courses in the mathematics department at FSU, at or above the calculus level, all of which lead to the fulfillment of the requirements for a major in the mathematical sciences. These courses must include at least one course numbered 300 or higher.
 - This would include MATH 206 Discrete Math I, STAT 307 Intermediate Statistics, and STAT 308 Applied Statistical Data Processing.
 - This would NOT include MATH 180 Precalculus, MATH 217 Business Calculus, or STAT 208 Biostatistics.
3. Have maintained the equivalent of a grade point average of at least 3.0 on a 4 point scale in all courses taken in the mathematics department at FSU that lead to the fulfillment of the requirements for a major in the mathematical sciences.
 - This would include ALL courses with a MATH or STAT prefix, including MATH 180, STAT 157, and STAT 208, that appear in a student's degree audit as satisfying a major requirement.
 - This would not include courses from other departments, e.g., computer science or education.
4. Have maintained the equivalent of a grade point average of at least 3.0 on a 4 point scale in all courses that lead to the fulfillment of the requirements for an undergraduate degree.

For additional information, please see either Professor Christopher Staniszewski or Professor Michael Krul.

Frank Castagna Memorial Award

This award is in memory of Dr. Frank Castagna, Associate Professor of Mathematics who was also an expert in Group Theory. The Frank Castagna Award for Excellence is presented annually to the graduating senior mathematics major selected by the faculty of the Mathematics Department for superior achievement in mathematics.

Recent Award Recipients:

Year	Recipient(s)	Year	Recipient(s)
2023	Alex Campbell, Katherine Sommerville	2019	Ariane DeSouza
2022	Madison Bonvino, Ellen Lucier	2018	Faith Richard
2021	Adienex Fernandez, Emma Gertje	2017	Elizabeth Golden
2020	Jesse Pozzi	2016	Andrew Stone
		2015	Andrea Smith