Undergraduate Mathematics Programs at OSU

The Department of Mathematics at OSU offers a Bachelor of Science degree in mathematics, a minor in mathematics, and a minor in actuarial science. The Bachelor of Science in mathematics trains students to think logically and precisely, and exposes students to many areas of pure and applied mathematics. This degree has a transcript visible option, the Secondary Teaching Emphasis. In addition to this pamphlet, further information about mathematics at OSU can be found under Undergraduate Programs on the Department of Mathematics website.

RESOURCES FOR STUDENTS

Mathematics Advising

You should periodically confer with an advisor in the mathematics department. You are free to consult with any advisor, although many students choose one advisor to see regularly. At the beginning of your final year you should schedule a Graduation Audit by applying to graduate in Student Online Services. To arrange an advising appointment and for inquiries about our mathematics programs write to: MathHeadAdvisor@math.oregonstate.edu

Mathematics Learning Center

The Mathematics Learning Center (MLC) is located on the first floor of Kidder Hall, room 108. The MLC provides free drop-in tutoring, reference books, make-up testing, and other services and resources. Refer to the Mathematics Department website under MLC for the hours of operation and additional information.

Junior and senior math majors sometimes work as tutors in the MLC, either as a work-study job or for credit. The MLC also has tables appropriate for use by study groups. Math majors are encouraged to use the MLC as a place to meet and study with each other. There is a computer lab adjoining the MLC, which math majors are free to use unless a class is scheduled.

The Undergraduate Mathematics Reading Room

Undergraduate students are invited to use the Undergraduate Mathematics Reading Room, StAg 402, for studying and meeting with fellow students. The hours vary by term. The room is maintained by officers of the OSU math club and Pi Mu Epsilon.
**DEGREE PROGRAMS**

The Department of Mathematics offers an undergraduate major and two minors. The Department of Mathematics is a unit within the College of Science, which is one of eleven academic colleges at OSU. The College of Science and the university have certain requirements for a bachelor’s degree. For example, a student must earn a total of at least 180 credits, at least 60 of which must be upper division courses. Each student must complete OSU’s Baccalaureate Core in addition to satisfying the requirements for a major in some subject. The details of the university and college requirements are available in the OSU catalogue. All students can track their progress using the on-line MyDegrees program audit system.

**The Major Degree Program in Mathematics**

All math majors must take certain core courses in mathematics. The lower division courses (those numbered lower than 300) and MTH 341 are prerequisite to the 300-level courses. Since these requirements total only 27 credits, most of the university Baccalaureate Core can also be completed during the first two years of study. Some of the courses required for the math major will simultaneously satisfy requirements of the Baccalaureate Core.

A student who does not place directly into the calculus sequence in the first year can usually still complete the lower division courses during the first two years, as some courses in the calculus sequence can be taken simultaneously. A flow chart for these prerequisites follows.

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MTH 251 → MTH 252 → MTH 253 *(Spring Term Only)*
  \[\quad\]
     MTH 254 → MTH 341  
     \[\quad\]
     \[\quad\]
     MTH 255  
     \[\quad\]
     MTH 256
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Alternately, a student arriving at OSU with some calculus credit may be able to complete the lower division requirements in one year. In this case, the student may decide to begin our “junior core” during the second year at OSU.

The junior core consists of six courses that all math majors must take. Each of these courses is (expected to be) offered during the term indicated in the checklists at the end of this pamphlet. In addition to the junior core, seven other upper division courses are required. Math majors gain breadth of knowledge by choosing five of these courses from a diverse list of mathematical topics. The requirements for our major program are summarized on page 4 of this pamphlet. Individual check lists are also available on-line.
The Major Degree Program with a Secondary Teaching Emphasis
Majors who plan to teach mathematics in middle or high school may earn a transcript visible option in education. The 400-level math courses required for this Secondary Teaching Emphasis option are different from those required for the math major. Future teachers are also required to take two courses in math education that will help prepare them for a graduate program in education and teacher licensure. Students in this option who would like a stronger background in mathematics are encouraged to take some of the senior level core math courses as electives. The requirements for the math major with Secondary Teaching Emphasis are described in a checklist on page 5 of this pamphlet. An individual check list for this option is also available on-line.

Minor Degree Programs in Mathematics
The Department of Mathematics at Oregon State offers a minor in Mathematics and a minor in Actuarial Science.

The minor in Actuarial Science allows students to take courses of interest to the financial and actuarial industries and helps students prepare for the first examination administered by the Society of Actuaries. For more information about this program is available under Actuarial Science on the departmental website. You may also send a message to ActuarialInfo@math.oregonstate.edu. A very informative website about the actuarial profession is BeAnActuary.

Requirements for both minor programs are described on page 6 of this pamphlet where a checklist for the Actuarial Science is included. Further information about both minor programs can be found under Undergraduate Programs on the Department of Mathematics website, and by writing to MathHeadAdvisor@math.oregonstate.edu.
Checklist for the Bachelor of Science in Mathematics

Listed below are the requirements for the math major portion of the Bachelor of Science in Mathematics. Students also need to satisfy the requirements of the university and the College of Science. Frequent consultation with an advisor is recommended to monitor timely degree completion.

A grade of at least C– and a GPA of 2.25 are required in all upper-division mathematics courses used to fulfill degree requirements. An OSU GPA of 2.00 is required by the College of Science. No course used to fulfill requirements for your major may be taken “S/U.”

Lower Division:
- MTH 251 - 256 The Calculus Sequence (MTH 251, 252, 253, 254, 255, 256)
- Physics 211 General Physics with Calculus
- MTH 341 Linear Algebra I

Upper Division:
- MTH 311 (F) Advanced Calculus I
- MTH 355 (F) Discrete Mathematics
- MTH 312 (W) Advanced Calculus II
- MTH 342 (W) Linear Algebra II
- MTH 343 (S) Introduction to Modern Algebra
- WIC\(^1\) (S) MTH 323 Mathematical Modeling (even # years) or MTH 333 Fundamental Concepts of Topology (odd # years) or MTH 338 Non-Euclidean Geometry (every year)

- 1__________ 5 courses from the following list:
- 2__________ MTH 440 (F) Computational Number Theory
- 3__________ MTH 451 (F) Numerical Linear Algebra
- 4__________ MTH 463 (F) Probability I
- 5__________ MTH 430 (W) Metric Spaces and Topology
  MTH 434 (W) Introduction to Differential Geometry
  MTH 480 (S) Systems of Ordinary Differential Equations
  MTH 483 (S) Complex Variables

- 1__________ 2 more courses of upper division math, 400 level statistics or other approved courses of a mathematical nature.\(^2\)
- 2__________

*Course offerings and schedules are subject to change.

\(^1\) Writing Intensive Course, a component of the Baccalaureate Core.

\(^2\) Possible courses are non-blanket (not X99- or X0X numbered) upper-division MTH courses (except for MTH 390) or 400-level ST courses or other courses of a mathematical nature approved by the departmental head advisor.
Checklist for the Bachelor of Science in Mathematics with Secondary Teaching Emphasis Option

Listed below are the requirements for Secondary Teaching Emphasis option of the Bachelor of Science in Mathematics. Students also need to satisfy the requirements of the university and the College of Science. Frequent consultation with an advisor is recommended to monitor timely degree completion.

A grade of at least C– and a GPA of 2.25 are required in all upper-division mathematics courses used to fulfill degree requirements. An OSU GPA of 2.00 is required by the College of Science. No course used to fulfill requirements for your major may be taken “S/U.”

**Lower Division:**
- MTH 251 – 256 The Calculus Sequence (MTH 251, 252, 253, 254, 255, 256)
- Physics 211 General Physics with Calculus
- MTH 341 Linear Algebra I

**Upper Division**¹
- MTH 311 (F) Advanced Calculus I
- MTH 355 (F) Discrete Mathematics
- MTH 312 (W) Advanced Calculus II
- MTH 342 (W) Linear Algebra II
- MTH 343 (S) Introduction to Modern Algebra
- MTH 338 (S) Non Euclidean Geometry, a WIC²
- TCE 309 (F,W,S) Field Practicum (3 credits)
- SED 414 (W) Inquiry in Mathematics and Mathematics Education
- MTH 361 (S) Introduction to Probability (MTH 463 can be substituted)
- ST 351 (F,W,S) Introduction to Statistical Methods (ST 421 can be substituted)
- MTH 491 (F) Algebraic and Geometric Transformations
- MTH 492 (W) Algebraic and Geometric Transformations
- MTH 493 (S) Algebraic and Geometric Transformations

*Course offerings and schedules are subject to change.

¹ Students who want a stronger background in mathematics should choose some courses from the seven senior directed electives listed in the mathematics major.
² Writing Intensive Course, a component of the Baccalaureate Core.
Checklists for the Minor Programs in Mathematics

Minor in Mathematics

The requirements for a minor in mathematics are 30 credits of MTH courses numbered 231 or higher, including 15 credits numbered 311 or higher. Either MTH 311 or MTH 341 must be included. MTH 390 may not be used for credit in the mathematics minor. MTH 251, MTH 252 and MTH 254 are strongly recommended for students pursuing a minor in mathematics. No course used to fulfill requirements for the minor in mathematics may be taken “S/U.” A minimum GPA of 2.0 is required in this minor.

Minor in Actuarial Science

28 credits are required for the minor in actuarial science. These credits are fulfilled by the courses in the checklist below. A minimum GPA of 2.0 is required in this minor. No course used to fulfill requirements for the minor in actuarial science may be taken “S/U.”

The following restriction applies to courses used for the minor in Actuarial Science: No upper-division courses other than MTH 306 and MTH 341 used to satisfy requirements in a student's major may also be used to satisfy the requirements of the actuarial science minor.

- MTH 251 Differential Calculus
- MTH 252 Integral Calculus
- MTH 253 Infinite Series and Sequences
- MTH 254 Vector Calculus I
- MTH 341 Linear Algebra
- MTH 361 Introduction to Probability

2 (or more) courses from the following list

- 1. MTH 351 Introduction to Numerical Analysis
- 2. MTH 463 Probability I
- MTH 464 Probability II
- MTH 465 Probability III
- MTH 467 Actuarial Mathematics
- ST 411 Methods of Data Analysis
- ST 412 Methods of Data Analysis
- ST 413 Methods of Data Analysis
- ST 421 Introduction to Mathematical Statistics
- ST 422 Introduction to Mathematical Statistics
- ST 441 Probability, Computing, and Simulation in Statistics
- ST 443 Applied Stochastic Models

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1 MTH 306 (Matrix and Power Series Methods) may be substituted for MTH 253.