Undergraduate Mathematics at OSU

The Department of Mathematics at OSU offers two bachelor’s degrees 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 Option.

RESOURCES FOR STUDENTS

Advising

You should talk periodically to an advisor in the mathematics department. You are free to consult with any advisor, although most students choose one advisor to see regularly. General advising questions and inquiries about the undergraduate math programs at OSU can be sent to the following email address:

UnderGradInfo@math.oregonstate.edu

It is a good idea to see an advisor and have a graduation audit sometime just before, or near the beginning of, your final year. Further information about mathematics at OSU can be found on the Department of Mathematics website and on the bulletin board by the water fountain on the third floor of Kidder Hall.

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. See

http://www.math.oregonstate.edu/mlc

for hours of operation and additional information. Math majors who have reached the upper division courses sometimes work as tutors in the MLC, either as a work-study job or for credit. The MLC also has a work area, with tables, appropriate for 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 being held there.

Math Reading Room

Undergraduate students are invited to use the Undergraduate Mathematics Reading Room, STAG 402, for studying and meeting with fellow students. The math reading room is well
equipped with tables, couches, white boards, computers, microwave and refrigerator. Select undergraduate members of the OSU student chapter of Pi Mu Epsilon (the National Mathematics Honor Society) are available for consultation in the reading room (during select hours), as peer mentors. The room is maintained by officers of the OSU math club and Pi Mu Epsilon; the hours during which it is open vary by term.

**DEGREE PROGRAMS**

The Department of Mathematics offers two undergraduate majors and two minors. The Department of Mathematics is a unit within the College of Science, which is one of 11 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. Each student must complete OSU’s general education program, the Baccalaureate Core, and must satisfy the requirements for a major in some subject. The details of the university and college requirements are available in the OSU catalogue and various other publications. All students can track their progress toward degree online using the MyDegrees program audit system. For more information and access to the login page, visit the following page:

http://oregonstate.edu/registrar/mydegrees/home.

All math majors take certain core courses. The lower division courses (those numbered lower than 300) and math 341 are usually taken during a student’s first two years. These requirements total only 45 credits, so most of the university baccalaureate core can also be completed during these first two years. Some of the courses required for the math major will simultaneously satisfy requirements of the baccalaureate core.

If a student does not place directly into the calculus sequence as a freshman, he or she can still complete the lower division courses during the first two years, as some terms in the calculus sequence can be taken simultaneously. A flow chart for the prerequisites in the calculus sequence follows. The 6 term sequence can be completed in 4 terms if need be.

251 → 252 253 → 255
     254 → 256

Alternately, if a student arrives at OSU with credit for some calculus, he or she may be able to complete the lower division requirements in one year. In this case, the student may wish to begin what we call the “junior core” during his or her second year here.

The junior core consists of six courses, which all math majors must take. Each of these courses is (expected to be) offered during the term indicated in the checklist. In addition to the junior core, 7 more 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 the major and minor programs are summarized beginning on
Students 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 the education option are different from those required for the math major. Future teachers also are required to take two courses in math education that will help prepare them for a graduate program in education and teacher licensure. Students earning the education option who desire 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 the education option are described in a checklist on page 5 of this pamphlet. An individual check list for this option is available on-line.

**Minor 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 offers courses of interest to the financial and actuarial industries. The minor helps students prepare for the first examination administered by the Society of Actuaries. More information about this program is available at

[http://www.math.oregonstate.edu/Actuarial_Science_Program](http://www.math.oregonstate.edu/Actuarial_Science_Program)

or by sending a message to [ActurarialInfo@math.oregonstate.edu](mailto:ActurarialInfo@math.oregonstate.edu).

For more information about the minor programs in mathematics contact an undergraduate advisor in the Department of Mathematics at

[UnderGradInfo@math.oregonstate.edu](mailto:UnderGradInfo@math.oregonstate.edu).

Requirements for both minor programs are described in a checklist on page 6 of this pamphlet. Further information about both minor programs can be found on the Department of Mathematics website.
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 will also need to satisfy the requirements of the university and the College of Science to earn a degree. 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) Abstract Algebra
- WIC1 (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 1__________ 5 courses from the following list:
2 2__________ MTH 440 (F) Computational Number Theory
3 3__________ MTH 451 (F) Numerical Linear Algebra
4 4__________ MTH 463 (F) Probability I
5 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.

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1 Writing Intensive Course, a component of the Baccalaureate Core.
2 Non-blanket numbered (not X99- or X0X numbered) upper-division MTH courses (except for MTH 390), 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 the math major + secondary teaching emphasis option portion of the Bachelor of Science in Mathematics. Students will also need to satisfy the requirements of the university and the College of Science in order to earn a degree. 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 Division¹
- 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)  Abstract Algebra
- MTH 338 (S)  Non Euclidean Geometry, a WIC²
- TCE 309 (F,W,S)  Field Practicum
- SED 414 (W)  Inquiry in Mathematics and Mathematics Education
- MTH 361 (S)  Probability (For a stronger math preparation, substitute MTH 463)
- ST 351 (F,W,S)  Statistics (For a stronger math preparation, substitute ST 421).
- 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 wanting a stronger background in mathematics should choose some electives from the seven senior courses listed above 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. 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. No course used to fulfill requirements for the minor in actuarial science may be taken “S/U.”

- 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

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