

# Undergraduate Mathematics at OSU

## **Introduction:**

The mathematics department at OSU offers two bachelor's degrees. 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 can be obtained with a transcript visible option – the Secondary Teaching Emphasis Option. The second degree, the Bachelor of Science in Mathematical Sciences, is an interdisciplinary degree including coursework in the Departments of Statistics, Computer Science, and Mathematics.

## **Advice to the student:**

In addition to reading this information, you should talk periodically to a faculty advisor in the mathematics department. A list of the mathematics faculty members serving as advisors is available from the receptionist in the math department office, Kidder Hall 368, and on the mathematics department web site:

<http://www.math.oregonstate.edu/>

You are free to consult with any advisor, although most students choose one advisor to see regularly. 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.

## **Mathematics Learning Center:**

The Mathematics Learning Center (MLC) is located on the first floor of Kidder Hall, room 108. The MLC provides free tutoring, reference books, sample tests for some math courses and a variety of other services. 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.

## **Lounge**

The math department lounge, Kidder 302, is open to students. The lounge has comfortable seating, a refrigerator and a microwave. It is a good place to eat a brown bag lunch, get a little studying done or meet with other students.

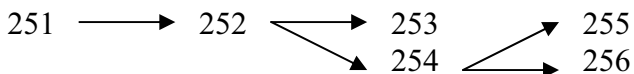
## **Requirements for the Bachelor of Science Degree:**

The mathematics department is a unit within the College of Science, which is one of 11 colleges in OSU. The College of Science and the university require certain things of students seeking 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 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. The College of Science Student Handbook is a useful source of information and includes a checklist, on page 3, for baccalaureate core courses and college-level requirements. It is available in the College of Science main office, Kidder Hall, room 128. A math advisor can help interpret university regulations, but unusual or complicated questions may require a visit to the College of Science office.

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.



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 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 math major are summarized in a checklist on page 4 of this pamphlet. An individual check list is available on-line.

The mathematics department at OSU also supports students who are training for careers in Actuarial/Financial Mathematics or as mathematics teachers in secondary school.

The student planning a career in Actuarial/Financial Mathematics completes all of the math major requirements, and takes certain electives from the department of economics and the business school. A math department advisor can provide more information about these electives, and general preparation for the initial exams of the National Society of Actuaries. There is ample free time within the major to complete the suggested electives.

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 take 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.

The checklist for the mathematical sciences degree is on page 6 and also is available on-line.

## Checklist for the Bachelor of Science in Mathematics:

The following courses must be passed with a grade of C- or better. The cumulative GPA for required upper division math courses must be at least 2.25.

### Lower division:

- MTH 251, 252, 253, 254, 255, 256, the Calculus sequence
- Physics 211
- MTH 341, Linear Algebra I

### Upper division:

- MTH 311 (Fall)                      Advanced Calculus I
- MTH 355 (Fall)                      Discrete Math/Mathematical Software
- MTH 312 (Winter)                    Advanced Calculus II
- MTH 342 (Winter)                    Linear Algebra II
- MTH 343 (Spring)                    Abstract Algebra
- WIC (Spring)                        MTH 323 or 333 or 338 (not all offered every year)

- 1 \_\_\_\_\_                      *5 courses from the following list:*
- 2 \_\_\_\_\_                      MTH 483 Complex variables
- 3 \_\_\_\_\_                      MTH 480 Systems of Differential Equations
- 4 \_\_\_\_\_                      MTH 434 Introduction to Differential Geometry
- 5 \_\_\_\_\_                      MTH 440 Computational Number Theory
- MTH 451 Numerical Linear Algebra
- MTH 463 Probability I
- MTH 430 Metric Spaces and Topology

- 1 \_\_\_\_\_                      *2 more courses* of upper division math, 400 level statistics,
- 2 \_\_\_\_\_                      or other approved course of a mathematical nature.

### Checklist for the Bachelor of Science in Mathematics with the Education Option:

The following courses must be passed with a grade of C- or better. The cumulative GPA for required upper division math courses must be at least 2.25.

#### Lower division:

- MTH 251, 252, 253, 254, 255, 256, the Calculus sequence
- Physics 211
- MTH 341, Linear Algebra I

#### Upper division:

- MTH 311 (Fall)                      Advanced Calculus I
  - MTH 355 (Fall)                    Discrete Math/Mathematical Software
  - MTH 312 (Winter)                 Advanced Calculus II
  - MTH 342 (Winter)                 Linear Algebra II
  - MTH 343 (Spring)                 Abstract Algebra
  - MTH 338 (Spring)                 Non Euclidean Geometry, a WIC
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- SED 309                            Field Practicum
  - SED 409                            Field Practicum
  - MTH 361                            Probability (For a stronger math preparation, substitute Math 463)
  - ST 351                             Statistics (For a stronger math preparation, substitute ST 421)
  - MTH 491                            Algebraic and Geometric Transformations
  - MTH 492                            Algebraic and Geometric Transformations
  - MTH 493                            Algebraic and Geometric Transformations

## Checklist for the Bachelor of Science in Mathematical Sciences:

All courses must be passed with a C- or better. The cumulative GPA for required upper division courses must be at least 2.25.

### All of these courses are required:

#### Mathematics

- MTH 251
- MTH 252
- MTH 253 or 306
- MTH 231
- MTH 232
- MTH 256
- MTH 311
- MTH 341
- MTH 351

#### Computer Science

- CS 151
- CS 161
- CS 162
- Either CS 271 or ECE 375
- CS 261
- CS 325

#### Statistics

- One of ST 351, 314, 317 or 201+209
- ST 421
- ST 422
- ST 411

- Only one of the following three term sequences is required:

#### Mathematics

- Three courses from MTH 451, 452, 453, 463, 464, 465, 440

#### Computer Science

- Three courses from CS 311, 321, 411, 420, 430, 440, 450, 475, MTH 440, 441, 451

#### Statistics

One of the two sequences

- ST 407, 412 and either 413 or 415
- ST 441, 443 and either 481 or 483

- Only one writing intensive course is required:

#### Mathematics

- MTH 333
- MTH 323
- MTH 338

#### Computer Science

- CS 361

(There are no WICs in Statistics.)