# Mathematics (MS)

Master's degree programs are available to suit the needs of students with various objectives. There are programs for students who intend to enter a doctoral program and for those who plan to conclude their formal study of pure or applied mathematics at the master's level.

In addition to general Division of Graduate Studies requirements, the specific graduate program courses and conditions listed below must be fulfilled. More details can be found in the Department of Mathematics *Graduate Student Handbook*, available in the department office and online (https://math.uoregon.edu/wp-content/uploads/2022/11/Handbook-22-23.pdf). All mathematics courses applied to degree requirements, including associated reading courses, must be taken for letter grades. A final written or oral examination or both is required for master's degrees except under the pre-PhD option. This examination is waived under circumstances outlined in the departmental *Graduate Student Handbook*.

## Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- Demonstrate mastery of subject knowledge in three core areas.
- Demonstrate ability to learn from non-expository sources.
- Conduct original and substantive research.

**Explanation:**

Demonstrate mastery of subject knowledge in three core areas.
Explanation: The three core subject areas taught in our department are algebra, topology/geometry, and analysis/probability. Graduate students are expected to attain a mastery of this material at an advanced level for two of the three core areas, and at an intermediate level for the third area.

Demonstrate ability to learn from non-expository sources.
Explanation: Learning material from research papers is different from learning from courses and textbooks. Graduate students are expected to demonstrate the ability to learn material from non-expository sources, including at least one source that is written in French, German, or Russian.

Conduct original and substantive research.
Explanation: The most important requirement completing a Ph.D. in mathematics is producing a dissertation containing original and substantive mathematical work.

The learning outcomes and assessments for students who earn a master's degree consist of a modified version of Learning Outcome #1 for Ph.D. students. To earn a master's degree, a student must complete full-year course sequences in each of the three core areas, one at the 600-level and two at the 500-level, with an average grade of B+ or better and a minimum grade of B or better in each sequence. In addition, the student is required to complete at least 45 graduate credit hours, at least 30 of which are completed in the Department of Mathematics.

## Mathematics Major

| Code | Title | Credits |
|---|---|---|
| **Three of the following sequences below with at least one at 600-level** [1] | | **30** |
| 500-Level Sequences | | |
| MATH 513 | Introduction to Analysis I | |
| & MATH 514 | and Introduction to Analysis II | |
| & MATH 515 | and Introduction to Analysis III | |
| MATH 531 | Introduction to Topology I | |
| & MATH 532 | and Introduction to Topology II | |
| & MATH 533 | and Introduction to Differential Geometry | |
| or MATH 53 | Introduction to Topology I | |
| & MATH 532 | and Introduction to Topology II | |
| & MATH 534 | and Introduction to Topology III | |
| MATH 544 | Introduction to Abstract Algebra I | |
| & MATH 545 | and Introduction to Abstract Algebra II | |
| & MATH 546 | and Introduction to Abstract Algebra III | |
| 600-Level Sequences | | |
| MATH 647 | Abstract Algebra | |
| & MATH 648 | and Abstract Algebra | |
| & MATH 649 | and Abstract Algebra | |
| MATH 634 | Algebraic Topology | |
| & MATH 635 | and Algebraic Topology | |
| & MATH 636 | and Algebraic Topology | |
| MATH 637 | Differential Geometry | |
| & MATH 638 | and Differential Geometry | |
| & MATH 639 | and Differential Geometry | |
| MATH 616 | Real Analysis | |
| & MATH 617 | and Real Analysis | |
| & MATH 618 | and Real Analysis | |
| MATH 616 | Real Analysis | |
| & MATH 672 | and Theory of Probability | |
| & MATH 673 | and Theory of Probability | |
| MATH 607 | Seminar: [Topic] | |
| & 607 | and Seminar: [Topic] | |
| & 607 | and Seminar: [Topic] [2] | |
| **Electives** [3] | | **9-15** |
| Total Credit Requirement: | | 45 |

1. At least 9 credits of 600-level mathematics courses. Excluding Reading and Conference: [Topic] (MATH 605).
2. Only MATH 607 courses in the "applied math" sequence count toward this requirement.
3. Up to 15 credits can be taken outside of mathematics.

Students should also have taken a three-term upper-division or graduate sequence in statistics, numerical analysis, computing, or other applied mathematics.