

Math Major Assessment Plan
Last Revised: December 3, 2018

Learning Outcomes

LO1: Demonstrate proficiency with the calculational techniques and applications of calculus, including the ability to show that limits and derivatives do or do not exist.

LO2: Demonstrate a familiarity with the breadth of mathematics, including linear algebra and at least one area from modern algebra, basic analysis, and number theory.

LO3: Read and write mathematical proofs, producing arguments that are logically and syntactically correct.

LO4: Demonstrate an in-depth understanding of some area of mathematics.

LO5: (For students on the secondary education track only) Pass the licensure examination in mathematics.

Assessment Methods

Educational goals LO1 and LO2 are assessed structurally within the major and need no further assessment. Students who complete the mathematics major must pass courses that require proficiency with calculus in order to succeed. Students cannot pass MATH 281-282 (or, in the case of the secondary education track, MATH 281 and 397) without computational proficiency in calculus. Similarly, the core course requirements ensure that students are inevitably exposed to a broad area of mathematics as part of their major.

LO3 and LO4 will typically be assessed in alternate years, using the following procedure. Each year the department will choose an "Assessment Subcommittee" of the Undergraduate Affairs Committee. This committee will select (in consultation with the relevant instructors and before these exams are given) a small number of questions from the final exams of core courses in the major. For LO3 these courses will typically be from 316-317, 347-348, and 391-392, whereas for LO4 they will typically be from another advanced sequence in the major (351-352, 461-462, 421-422, etc.) After these final exams are given, the instructor will make copies of the students' solutions for the Assessment Committee. The committee will audit the solutions given to the selected questions for the purpose of assessing whether students are engaging in mathematical reasoning and proof, and/or for the purpose of assessing whether the answers indicate in-depth understanding of the subject matter of this material. The committee will write up its findings in a report, to be shared with the head of undergraduate studies in mathematics and with the department head.

For LO5, we plan to develop a system for tracking majors who are headed toward a secondary teaching career. We will maintain a contact list for these students, and will assess LO5 by polling students who graduated in the past two years to find out what percentage of these students passed their licensure examination.

Assessment Processes and Reports

Each year the Assessment Committee will produce a report by the end of the school year (June). This report will be reviewed by the department head and head of undergraduate studies, who will share any information with the Undergraduate Affairs Committee if appropriate. Decisions about how to interpret the findings, as well as any resulting actions, will be made by appropriate subsets of these entities.

The department head, in consultation with the head of undergraduate studies (and perhaps delegating the job to this person), will produce a separate report detailing any initiatives the department has been working on related to undergraduate education, and describing any areas of concern or plans for the future. These two reports will together form the yearly "Assessment Report" of the department.