Program Learning Outcomes

Department of Mathematical Sciences

Updated: November 1, 2017

Mathematics Option

Students demonstrate the ability to:

1. Effectively communicate mathematical ideas by precisely formulating them in proper mathematical language (M333, M 383, M 384, M 431).
2. Produce rigorous proofs of results that arise in the context of real analysis (M 383, M 384).
3. Produce rigorous proofs of results that arise in the context of abstract algebra (M 431).
4. Produce rigorous proofs of results that arise in the context of linear algebra (M 333).
5. Construct direct, indirect, and proofs by induction and determine the appropriateness of each type in a particular setting. Analyze and critique proofs with respect to logic and correctness. (M 333,383,384)
6. Write solutions to problems and proofs of results that meet rigorous standards based on content, organization, coherence, logical arguments, and style. (M333, M 383, M 384, M 431)

Applied Mathematics Option

Students demonstrate the ability to:

1. Derive numerical methods for approximating the solution of problems of continuous mathematics (M 441, M 442).
2. Implement a variety of numerical algorithms using appropriate technology (M 441, M 442).
3. Set up mathematical models and critically interpret their results. (M 450, M451)
4. Select and implement an appropriate mathematical technique needed to analyze and validate mathematical models. (M 450, M 451)

Mathematics Teaching Option

Students demonstrate the ability to:

1. Reason with and about mathematical statements and construct and validate mathematical arguments. (M 242)
2. Solve problems with and reason about functional relationships and algebraic structures. (M 328)
3. Apply fundamental ideas of number theory and combinatorics in the exploration, solution, and formulation of problems. (M 328)
4. Create, critique, and revise proofs in Euclidean and non-Euclidean geometries. (M 329)

5. Model, analyze, and interpret situations using data analysis, statistics, and probability. (M 428)
6. Develop, apply and validate mathematical models using current and emerging technologies. (M 428)

Statistics Option
Students demonstrate the ability to:

1. Given a scientific question, students will design an appropriate sampling plan or experimental design (Stat 446)
2. Given a sampling plan or experimental design, students will be able to execute the plan or design. (Stat 446)
3. Students will use appropriate technology and statistical computing skills to conduct statistical analyses (Stat 408)
4. Given a scientific question and information about the study design used to collect data, students will be able to conduct an appropriate statistical analysis (Stat 411, Stat 412)
5. Students will be able to explain and interpret the results of a statistical data analysis in a written report, and in a way that is consistent with research question and study design. (Stat 411, Stat 412)

Schedule of Assessment

	Applied Mathematics	Mathematics	Mathematics – Teaching	Statistics
Even Fall	M 441	M 333	M 328	Stat 411
Odd Spring	M 442	M 431	M 329	Stat 412
Odd Fall	M 450	M 383	M 428	Stat 446
Even Spring	M 451	M 384	M 242	Stat 408