Syllabus for M 307, Spring 2019
Introduction to Abstract Mathematics

Meeting Time: MWF 12:00 - 12:50
Location: Math 306.

Professor: Jennifer Brooks
Office: Math 107
Office Phone: 243-2083
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Office Hours: MWF 1:00 – 1:50.


Course Description

This course is designed to help you develop the tools needed in upper-division proof-based courses. This is the course in which you make the transition from a learner of mathematics to a creator of mathematics.

More specifically, the learning outcomes for this course are:

1. Recognize correct and incorrect mathematical reasoning.
2. Demonstrate an understanding of basic mathematical logic.
3. Use counter examples in rigorous arguments.
4. Write clear and concise proofs using the following methods: direct proof, contrapositive proof, proof by contradiction and proof by mathematical induction.
5. Write clear and concise proofs using basic set theory.
6. Write clear and concise proofs using precise definitions for functions and relations.
7. Write clear and concise proofs using injections, surjections, and bijections to compare cardinalities of sets.

Assessment

Homework: 25%
Exams: 30%
Portfolio: 25%
Final: 20%

**Homework:** In upper-division courses, the homework assignments serve a different purpose than homework assignments given in 100- and 200-level courses; in the latter case, the main purpose of the homework is to give you practice with the basic ideas and techniques, and the grade is determined mostly through exams. In most upper-division courses, the “practicing” occurs on your own as you work through suggested exercises from the text and examples from the lecture. The homework assignments are where you are asked to bring together ideas and where you are to practice your mathematical writing skills. Homework is now the most important part of the assessment.
Homework is due each Wednesday. You are encouraged to work together and
get all the help you need from me. However, you are expected to submit your own
solutions.

**Exams.** There will be two midterm exams. They will be on and .

**Portfolio:** This is the part of the course in which you will really focus on
learning to write clearly. Each week, you must select a new problem to add to your
portfolio. Solutions are to be typed using latex. Each Monday, you must submit
the first draft of your portfolio problem. I will comment on, but not grade, the
solution at that time. The portfolio is submitted for grading at 3 points during the
semester. *Portfolio problems are to be entirely your own work.* View them as a sort
of take-home exam stretched over time, with a revision process.

**Final:** There will be a written final exam given .

**Academic Misconduct**

All students must practice academic honesty. Academic misconduct is subject to
an academic penalty by the course instructor and/or a disciplinary sanction by the
University. All students need to be familiar with the Student Conduct Code. The
Code is available for review online at http://www.umt.edu/SA/VPSA/index.cfm/page/1321.

**Students with Disabilities**

Students with disabilities may request reasonable modifications by consulting
with me. The University of Montana assures equal access to instruction through
collaboration between students, instructors, and Disability Services for Students
(DSS). For more information, consult http://www.umt.edu/disability.

**Important Dates**

Jan. 21 (Monday): MLK Day – no class.
Feb. 18 (Monday): Presidents’ Day – no class.
Feb. 15 (Friday): Portfolio 1 due
Feb. 22 (Friday): Exam 1.
Mar. 22 (Friday): Portfolio 2 due.
Mar. 25 – Mar 29: SPRING BREAK.
Apr. 4 (Friday): Exam 2
Apr. 26 (Friday): Last day of class.