

Math 307 Introduction to Proof

Fall 2015 CRN 13827

PART I GENERAL INFORMATION

- 1 Classroom and Meeting Time:** Deady Hall 205; MTWF 12:00-12:50pm
- 2 Text Book:** J. D'Angelo and D. West, Mathematical thinking (2nd ed.)
- 3 Instructor:** Peng Lu
- 4 Office Hours:** MWF 10:00-10:50am
- 5 Office and Phone Number:** Deady Hall 304, 346-4727
- 6 Email Address:** penglu@uoregon.edu
- 7 Web Page:** <http://canvas.uoregon.edu/>
- 8 Learning Outcome:** Students should be able to do the following.
- 8a) Know how to interpret and employ “if-then” statements, the converse statements, and the contrapositive statements.
 - 8b) Know what counterexamples to a general statement are and generate some counterexamples (by looking at contrapositive statements).
 - 8c) Know what definitions, theorems, and proofs are. Understand how each of these kinds of statements pertains to examples.
 - 8d) Be fluent with simple mathematical induction proofs for a variety of statements including using strong induction.
 - 8e) Interpret quantifiers and employ them in student’s own arguments.
- 9 Special Accommodation:** If you are a student with a documented disability, please meet with me soon to discuss your needs. If you have not already requested a notification letter from Disability Services outlining recommended accommodations, please do so soon.

PART II. HOMEWORK and EXAMS

- 1 Homework:** There will be up to nine homework assigned weekly, each homework will be collected on Wednesdays in class.
- 2 Exams:** Two in-class tests and one final exam (accumulative)
Graphing calculators are allowed
No makeup for tests unless there is a documented excuse
- 3 Grade:** Homework: 10%; Each test: 25%; Final exam: 40%

4 Important dates: You must bring a photo ID to the tests and the final
Test 1: 12-12:50pm, Tuesday, Oct. 20, 2015 in class
Test 2: 12-12:50pm, Tuesday, Nov. 17, 2015 in class
Final Exam: 10:15am-12:15pm Thur, Dec. 10, 2015

PART III. OUTLINE

We will do a cherry-picking of sections/topics from the book. The topic selection is centered around the goal that at the end of the quarter you achieve the learning outcome: you are able to understand mathematical proofs rigorously and to produce some mathematical proofs yourself. The following topics are highly likely to be discussed.

- Elementary logic (optionally including symbolic logic).
- Sets and functions (for example, establishing de Morgan's laws and that the preimage of an intersection is the intersection of the preimages).
- Divisibility (for example, establishing that a number is divisible by three if and only if the sum of its base-ten digits are).
- Sums of arithmetic and geometric sequences.
- Absolute values and inequalities (for example, a nice problem in the book is to describe when a quadratic polynomial is non-negative).
- Counting problems (for example, counting the subsets of a finite set).