

Introduction to Mathematical Reasoning

Math 300: Summer 2011

Instructor: Dr. Andrew D. Loveless

Office: Padelford C-339

Course Website: <http://www.math.washington.edu/~aloveles/>

e-mail: aloveles@math.washington.edu I will happily try to answer homework questions via email, just make sure to be specific about your questions if you write me.

Office Hours: MW 12:15-1:45 pm, F 12:15-1:15 pm. My office hours are also posted on my web page. They may change, so please check the webpage before you come by. I will also be available before my first lecture from 9:10-9:40 Monday, Wednesday and Friday. I can often stay later after 1:45pm on Monday and Wednesday, just let me know. You can also email me questions as a last resort if you can't make it to office hours.

Text: *Mathematical Thinking: Problem-Solving and Proofs*, 2nd edition, by D'Angelo and West.

Course Objectives: In this course, you will learn and practice the fundamental techniques of mathematical proof (logic, direct proof, contrapositive, contradiction, induction) in the context of elementary set theory, basic function theory, combinatorics, and number theory.

Grading: Your grade will be made up of:

Homework	140 points (35%)
Exam I	80 points (20%)
Exam II	80 points (20%)
Final Exam	100 points (25%)
Total	400 points (100%)

To be guaranteed above a 2.0 in the course, you must earn at least 300 of the 400 points this term. Here are a few significant points on the standard grade scale:

Points	Percentage	Grade
360	90	3.5
340	85	3.0
320	80	2.5
300	75	2.0
below 200	below 50	0.0

Please take the homework seriously as I have given it a lot of weight! I will help you in any way I can during office hours, but you need to put in the time. I will offer extra credit challenge problems each week that can help you get closer to the grade you desire (you should attempt all of these problems if you want a high grade).

Homework: Homework assignments will be handed out in class each week and will be collected in lecture on the designated day. Most problems will be from the book, but some will be created by me. Some assignments will have extra exploratory problems. You may also submit homework during my office hours. Homework submitted after the end of office hours on the due date will not be accepted. You should nicely write up all your homework and proofs (punctuation, grammar and all).

Exams: No outside sources (books, notes, etc.) will be allowed on exams. I will provide you with a basic fact sheet (which I will give to you on the review day). Scientific calculators (no graphing calculators) are allowed but rarely needed.

Exam Dates:

Exam I	Fri., July 15	in lecture
Exam II	Fri., August 5	in lecture
Final Exam	Fri., August 19	in lecture

Make-Ups: Late homework assignments will not be accepted for any reason. You will be allowed to miss one homework assignment without penalty to your grade. In the case of observance of religious holidays or participation in university sponsored activities, such as debate or athletics, arrangements must be made at least one week in advance for exams. You will be required to provide documentation for your absence. Make-up exams will not be given. If you miss an exam due to **unavoidable, compelling, and well-documented** circumstances, your final exam will be weighted more heavily.

Resources for Students with Disabilities: The University of Washington is committed to providing access, equal opportunity and reasonable accommodation in its services, programs, activities, education and employment for individuals with disabilities. To request disability accommodation contact the Disability Services Office at least ten days in advance at: 206-543-6450/V, 206-543-6452/TTY, 206-685-7264 (FAX), or dss@u.washington.edu.

About the Course :

This will be significantly different than any math class you have ever taken. In basic algebra and calculus courses, you are given a theorem and asked to apply it on several exercise problems. In this course, you are given a statement and asked to prove why it will always be true in all circumstances (or give a situation where it is false). Your proof must be an infallible argument that is justified in each step by axioms or other known results. You will be grading on the accuracy and clarity of your proofs.

Higher mathematics is about discovering new theorems and proving them. A proof makes a theorem, a theorem. Without a proof a statement is just a conjecture and it cannot be used reliably because we don't know if it will always work. Proofs hold the essence and beauty of mathematics. The allure of higher mathematics is that you can sit down one afternoon and write a proof for a theorem that could change the world with only pencil, paper and ingenuity.

About the Instructor : Dr. Andrew D. Loveless graduated with a Ph.D. in Mathematics from Washington State University in the summer of 2005. My dissertation is entitled "Extensions in Theory Lucas and Lehmer Pseudoprimes" which pertains to the ability of finding large (200 digit) primes which are essential to modern cryptography. I have published papers in the areas of number theory and combinatorics. Since receiving my doctorate, I have taught as a lecturer (now a senior lecturer) at the University of Washington for 5 years earning a few teaching awards along the way including "Faculty Member of the Year" as voted on by the interfraternity council. In particular, I have experience teaching Precalculus, Calculus, Business Math, Linear Algebra, and Mathematical Reasoning. Personally, I have been married for eight years and we have a four year old son and a two year old daughter. I am a Washington native (originally from Yakima, Washington). My undergraduate studies were at the University of Puget Sound where I double majored in Mathematics and Computer Science. I have a passion for mathematics, especial problems from number theory that are tantalizingly simple to state yet still remain unsolved after hundreds of years. If your interested ask me sometime and I'm sure I can stir up a few interesting problems for you.

I look forward to getting to know all of you. Please visit my office hours regularly. Don't let yourself fall behind.