Math 321

Introduction to Advanced Mathematics, Fall 2015

Tuesday and Thursday, 9:00-10:15, Keller 313

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Office: PSB 321
Office Hours: Tuesday 2:30-3:30, Thursday 1:30-2:30
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Course Description: Formal introduction to topics necessary for advanced math courses, including: symbolic logic, naive set theory, functions and relations, methods of proof and axiomatic systems. Learning mathematical expressions in writing is an integral part of this course.

Course Objectives: Upon successful completion of Math 321, the student will be able to

1. Work with basic foundational concepts common to most 400-level mathematics courses.
2. Develop and write direct proofs, proofs by contradiction and contraposition, and proofs by induction.
3. Understand the axiomatic approach to simple mathematical systems.

Prerequisite(s): Math 243 (or concurrent) or 253A (or concurrent) or consent.

Textbook: *How to Prove It: A Structured Approach*, 2nd Edition, by Daniel Velleman.

Grade Distribution:

Homework assignments	40%
Quizzes	10%
Midterm Exams	30% (15% each)
Final Exam	20%

Letter Grade Distribution: Your letter grade will be determined according to the standard 10-point scale (A: 90 - 100%; B: 80 - 90% ; C: 65 - 80%; D: 55 - 65%) with plus or minus grades assigned appropriately.

General Expectations: You should read the Math Department's general expectations of students at www.math.hawaii.edu/∼dale/Expectations.html.

Expectations: Homework exercises and reading will form the basis of testable material for the course. You should generally read an assigned section before going to class and attempt to complete the accompanying homework soon after. The list of homework and reading will be assigned/updated throughout the semester.

On reading: You should expect to read each chapter more than once. In fact, you may have to reread sections before, during and after attempting the homework.

On doing homework: Although suggested homework problems will not be turned in, they are essential to understanding the material. You should ask about them in class (when appropriate) and office hours. As in previous math classes, working problems is the most effective way to learn the material.

Quizzes: We will have a quiz roughly once per week (on Thursday). Although quizzes will not make up a major part of the final grade (10%), it will give feedback and prepare you for the midterms and final. The material on the quizzes will be based on both reading and homework. The quiz with your lowest score will be dropped.

Problem Sets: This is a writing intensive course. The writing components of the course are primarily in the graded homework; these count for 40% of the grade of the course. One problem set will be assigned (roughly) every two weeks. You will have two weeks to complete each. **These assignments will be fairly long, so do not start them the night before they are due!** Answers must be written in complete sentences as each problem set will be graded both on exposition and correctness. You are welcome to work with others, ask me questions, or use textbooks. Please make clear when an answer, or part of an answer comes from the textbook or a discussion with someone else: you will not lose points for this, but it helps me see how everyone is getting along, and is good practice in terms of academic integrity.
After the problem set has been collected, I will grade it and hand it back quickly (ideally by the next class period). If you have any answers that are close to correct, and/or that lost points due to exposition, you will have another week to correct those. The grading of the problem set will go as follows:

1. For the initial submission, each problem will be labeled correct, unsatisfactory or needs improvement. Full points will be recorded for each correct answer, a zero will be recorded for each omitted or unsatisfactory answer and a small fraction of full points for each answer needing improvement.

2. The resubmission should include the original assignment and corrected versions of each problem labeled as needs improvement. Each such problem will be regraded; a new score will be awarded between the original score and full points.

Midterm Exams: Two in-class midterm will be given, tentatively, on Oct. 6 and Nov. 10; a firm announcement will be made two weeks before the exam.

Final Exam: A comprehensive final examination will be given at the time designated by the registrar; currently, it is set for Dec. 15 at 9:45a.m.