

**Humboldt State University
Mathematics Department
Math 240: Introduction to Mathematical Thought**

Fall Semester, 2016

Instructor:	Dr. Peter Goetz
Office Location:	BSS 358
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Office Hours:	Monday: 11:00 - 12:00 Tuesday: 2:00 - 3:00 Wednesday: 9:00 - 10:00 Thursday: 11:00 - 12:00 Friday: 9:00 - 10:00
Class Days/Time:	MWF from 1:00 - 1:50 PM
Classroom:	NR 223
Prerequisites:	Math 110 or instructor approval

Course Description

Mathematical reasoning, writing, and proofs; sets, functions, topics in discrete mathematics, number theory, group theory; problem formulation, and problem solving. The format of the course is lecture-discussion. A minimum grade of C- is required for this course to count toward the mathematics major.

Course Goals and Student Learning Outcomes

Course learning outcomes:

- 1) Articulate a framework of reasoning for the mathematical sciences (what is truth in mathematics?)
- 2) Explain, construct, and evaluate mathematical arguments (reasoning and proof).
- 3) Use multiple forms of mathematical argument, including direct and indirect, contradiction, and mathematical induction.
- 4) Communicate mathematical ideas and arguments efficiently and effectively (orally, graphically, symbolically, and in writing).

Program learning outcomes:

It is expected that each mathematics graduate will be able to:

- 1) Reason mathematically and statistically.
- 2) Solve complex problems using mathematics and statistics.
- 3) Communicate mathematical and statistical ideas.
- 4) Evaluate mathematical and statistical work.
- 5) Demonstrate mathematical knowledge commensurate with national norms.

HSU learning outcomes:

HSU graduates will have demonstrated:

- 1) Effective communication through written and oral modes.
- 2) Competence in a major area of study.

Required Texts/Course Website

Textbook:

Mathematical Proofs: A Transition to Advanced Mathematics, Third Edition, G. Chartrand, A. Polimeni, P. Zhang

ISBN-13: 9780321797094

Course Website:

Course announcements and links to course handouts, homework assignments, solutions to exams and other material will be posted at

<http://users.humboldt.edu/pgoetz/math240.html>

Course Expectations

I expect you to participate in the course by attending all of the lectures, to arrive to class on time and prepared to learn, and to turn in all homework assignments by the due date. I expect you to read the required section in the textbook before each lecture. I expect you to be polite and respectful of your fellow class members and myself. Please refrain from cell phone use in class except for emergencies and have your phone on silent during class. In general, it is expected that students spend at least two hours studying outside of class for each class meeting. Plan on spending at least 6 hours per week studying for this course. (If you really want to excel, you might need to study 12 or more hours per week.)

You may expect that I: come to class prepared to teach, give clear lectures, assign homework problems that are relevant to the course, and prepare exam questions that accurately measure your progress in the course. Additionally, I am available outside of class for consultation in office hours. I hope to share with you my passion for mathematics!

Assignments and Grading Policy

Attendance and Classroom Etiquette:

Attendance will be taken at the beginning of each lecture. Students who arrive to class after roll is taken will be marked late; two late marks equal one absence. Anyone arriving more than ten minutes late to class will be counted absent for that day. Each student is allowed three absences without penalty, but please email me in this event, before class, as a courtesy. Each absence after the allowed three, if not excused, will be counted as unexcused. Following are examples of excused and unexcused absences.

Excused:

- Documented serious illness/injury
- Documented emergency in the immediate family
- Recognized commitments to the university

Unexcused:

- Weddings; family visits or special occasions (e.g., birthdays, reunions, anniversaries, etc.)
- Work or school conflicts (e.g., “I have a huge research paper due in another class.”)
- Vehicle broke down, missed the bus
- “I got the due date/quiz or exam time/meeting place/assignment mixed up/wrong/confused
- “I forgot”, “My alarm clock didn’t ring/work”

Each student is expected to observe and uphold appropriate rules of classroom etiquette (e.g., preparedness, timely attendance, attentiveness, engagement, respectfulness, responsibility) and can expect to be credited for such behavior. Likewise, any student’s behavior that interferes with the teaching and/or learning process in the classroom, whether it is something that interferes with the learning of the student in question or with the learning of fellow students, will be penalized. For example, it is not appropriate for a student to doze or nap during class; it is not appropriate to do homework or test preparation for another class; it is not appropriate to be engaged in leisure activities such as doodling, playing games or reading newspapers, magazines, catalogs; and it is not appropriate to be chatting with fellow students on matters unrelated to class discussion.

Since one of the most significant problems we have is the improper use of technology, if your cell phone is used, or is visible during class, you will be counted as absent for that day. This list of disapproved behaviors is not intended to be exhaustive and students are invited to consult with me on any other matters of classroom etiquette. Penalties for not observing classroom etiquette include being counted absent (without excuse) for the day or being asked to leave the classroom. Flagrant and persistent non-observance of classroom etiquette may result in a student being removed from the class roster and failure of the course.

Attendance and Classroom Etiquette is worth 10% of your overall course grade.

Homework:

There will be short homework assignments, 3 problems, due each week on Friday. See the class handout for the assignments and their due dates. This will also be posted on the course website. Your homework must be written neatly and carefully, and must be stapled (points will be deducted for sloppy or illegible work, or if the assignment is not stapled). I will be grading your homework both on mathematical content and exposition, so use proper grammar, and write complete English sentences where possible. For excellent advice on mathematical writing, be sure to read Chapter 0 of our textbook. You will certainly benefit from rereading this chapter periodically throughout the course as you progress in your writing of mathematical proofs.

I encourage you to work together and to discuss the homework with your classmates, but you must turn in your own work, written in your own words. Plagiarizing work from the internet, or copying from anyone will absolutely not be tolerated. If you are caught, or if I suspect that you have copied work that is not your own, you will be given a score of zero on the assignment, and it will be necessary that you meet with me in my office. For more detailed steps that will be taken, please read:

<http://www2.humboldt.edu/studentrights/academic-honesty>

Absolutely no late homework will be accepted.

Homework is worth 10% of your overall course grade.

Quizzes:

There will be five quizzes throughout the semester. I will tell you in lecture what material to study for each quiz. Quizzes will take place on Fridays. See the weekly schedule below for dates.

Quizzes are worth 20% of your overall course grade.

Exams:

We will have one midterm exam. The date for the exam is given below. Mark your calendar and plan accordingly as **no makeup exams** will be given.

Midterm Exam: Monday, October 10, 2016

The Midterm Exam is worth 30% of your overall course grade.

Final Exam:

The final exam is cumulative.

Day-Date-Time-Place: Monday, December 12, 2016; 12:40 – 2:30 PM; NR 223

The Final Exam is worth 30% of your overall course grade.

Grading Components:

Attendance and Classroom Etiquette	10%
Homework	10%
Quizzes	20%
Midterm Exam	30%
Final Exam	30%

Grading Scale:

All numbers listed below are in percentages. I will round your overall weighted course percentage to the nearest whole percent. Participation in class may work in your favor for borderline cases.

A: 92-100; A-: 90-91; B+: 88-89; B: 82-87; B-: 80-81; C+: 78-79; C: 68-77; C-: 64-67; D: 55-63;

F: 0-54

Weekly Schedule

During class time we will have a mix of lecture and discussion. On the weekly schedule below, you will see a column titled “Reading”. Those are the sections in our textbook I will expect you to have read in preparation for that week’s lecture. Reading the sections before lectures will enable you to gain more information from the lectures. Since part of your grade in the course is based on attendance and participation, it is very important that you keep up with the readings and attend each lecture prepared to discuss the material in the readings.

Week	Topics	Reading	Assignments
1 (8/22-8/26)	Sets	Chapter 0; 1.1-1.4	Homework 1
2 (8/29-9/2)	Cartesian product; direct and contrapositive proofs	1.6; 3.2, 3.3	Quiz 1 Homework 2
3 (9/5-9/9)	Proofs with cases; divisibility	3.4; 4.1	Homework 3
4 (9/12-9/16)	Proofs about congruence, sets	4.2, 4.4-4.6	Quiz 2 Homework 4
5 (9/19-9/23)	Counterexamples, proof by contradiction	5.1, 5.2	Homework 5
6 (9/26-9/30)	Existence proofs	5.4, 5.5	Quiz 3 Homework 6

7 (10/3-10/7)	Induction	6.1, 6.2	Homework 7
8 (10/10-10/14)	Strong induction, relations	6.4; 8.1	Midterm Exam Homework 8
9 (10/17-10/21)	Equivalence relations	8.2-8.4	Homework 9
10 (10/24-10/28)	Congruence modulo n	8.5, 8.6	Homework 10
11 (10/31-11/4)	Functions	9.1-9.3	Quiz 4 Homework 11
12 (11/7-11/11)	Bijective functions	9.4-9.6	Homework 12
13 (11/14-11/18)	Cardinality	10.1-10.3	Homework 13
14 (11/28-12/2)	Group theory	13.1, 13.2	Quiz 5 Homework 14
15(12/5-12/9)	Group theory	13.3-13.5	Homework 15
16 (12/12)	Final Exam: 12:40 – 2:30 PM		

University Policies

The following link provides HSU policies on: academic honesty, attendance and disruptive behavior, complaints against faculty, staff, or administrators, student code of conduct, and animals in classrooms or laboratories. It also has procedures for dropping or adding a class, **please note that September 5, 2016 is the deadline to Add or Drop courses without a serious and compelling reason for the Fall 2016 semester**, and campus emergencies. Finally there is information regarding counseling and psychological services, the student disabilities resource center, financial aid, and academic and career advising.

<http://www2.humboldt.edu/academicprograms/syllabus-addendum-capus-resources-policies>