

Spring 2014. MATH3310. Section 002.

## Introduction to Mathematical Reasoning and Proof

**Instructor:** Luan Thach Hoang

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Office hours: TR 11:00 am - 12:00 pm, W 2:00 pm - 3:00 pm

**Time and Classroom:** TR 12:30 pm - 1:50 pm English And Philosophy 150

**Course website:** <http://www.math.ttu.edu/~lhoang/2014Spr-M3310/>

Updates about the course and other related announcements will be posted on this webpage.

**Prerequisite:** MATH 2350 or 2450.

**Text:** *Mathematical Proofs: A Transition to Advanced Mathematics*, 3th edition by G. Chartrand, A. D. Polimeni, P. Zhang, published by Pearson

**Course Description:** This course will teach students how to construct and organize their mathematical reasoning and develop skill for writing mathematical proofs. This is a writing intensive course.

### Course Outline:

- Chapter 1 - Sets
- Chapter 2 - Logic
- Chapter 3 - Direct proof and proof by contrapositive
- Chapter 4 - More on direct proof and proof by contrapositive
- Chapter 5 - Existence and proof by contradiction
- Chapter 6 - Mathematical induction
- Chapter 7 - Prove or disprove
- Chapter 8 - Equivalence relations
- Chapter 9 - Functions
- Chapter 12 - Proofs in calculus
- Selected topics (if time permits)

**Expected Learning Outcomes:** Students are expected to understand the following concepts and use them in various problems: Sets, cardinality, subsets, elements, union, intersection, functions (including the meaning of injectivity, surjectivity and bijectivity), equivalence relations/classes, as well as an introduction to modular arithmetic. Students are expected to become proficient in reading and writing proofs.

**Methods of Assessment of Learning Outcomes:** Assessment of the learning outcomes will be achieved through homework assignments, two midterm exams, and a final exam.

**Homework Assignments:** Written homework will be assigned weekly and will be collected in class.

**Grading Policy:** Homework will count for 30% of the grade. The lowest score of homework will be dropped. There will be two midterm exams in class, each will count for 20% of the grade. The final exam will count for 30% of the grade. All in-class exams are closed-book. No make-up exams are given unless legitimate documents for excuses are presented to the instructor at least a week in advance. Grading Scale: A:

90%-100%, B: 80%-89%, C: 70%-79%, D: 60%-69%, F: below 60%

**Attendance Policy:** Students must go to lectures and attendance will be taken. If you miss no more than four lectures, a bonus of three points will be added to your final grade.

### **Examination Schedule:**

- Midterm 1: Thursday, February 27
- Midterm 2: Thursday, April 17
- FINAL EXAM: 1:30 p.m. - 4:00 p.m. Tuesday, May 13, English And Philosophy 150

### **Critical Dates:**

- January 15, Wednesday: Classes begin.
- January 20, Monday: Martin Luther King Jr. Day. University holiday.
- January 31, Friday: Last day for student-initiated drop on MyTech without academic penalty.
- March 15 – 23, Saturday – Sunday: Spring Break! No classes.
- March 26, Wednesday: Last day for student-initiated drop on MyTech with academic penalty.
- April 21, Monday: No classes.
- May 1 – May 7, Thursday – Wednesday: No examinations except for makeup exams.
- May 6, Tuesday: Last day of classes.

**Academic Misconduct:** Academic dishonesty is intolerable and will be punished to the full extent allowed by the University policy.

**Civility in the Classroom:** Texas Tech University endeavor to foster a classroom climate of mutual respect among students and between students and teacher. Students are expected to maintain a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor, students are prohibited from engaging in any other form of distraction. Students must attend class on time and are not allowed to leave the class before the end of the hour without authorization. During class time students are not allowed to eat, smoke, drink alcohol, text, chat, sleep, play games, read newspapers, wear earphones, play with smart phones or tablets, etc. Please put silent mode to all your electronic devices. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class.

**Students with Disabilities:** Any student who because of a disability may require special arrangements in order to meet course requirements should contact the instructor as soon as possible. *I would appreciate hearing from anyone who has a disability that may require special accommodations. I am sure we can work out whatever arrangements are necessary. Please see me during my office hours.* Student Disability Services office is in 335 West Hall (phone: 806-742-2405).

**Advice:** Come to class regularly, work on homework problems. Ask questions in class and get help from the Tutoring Center (information will be provided) or from the instructor during the office hours. Since a lot of material will be covered, students have to master them quickly and do not wait too late until the midterms or the final exam. Students are encouraged to give feedbacks to the instructor during the semester.

**NOTE:** When needed, the instructor will communicate with the students using their TTU email addresses. At the beginning of the semester, the instructor will send an email to confirm the students' email addresses. If a student does not receive this message by the time of the second class, he/she must contact the instructor immediately.