Introduction to Proofs
Math 3300-001 – Fall 2010

Time: Tuesday, Thursday 7:00 – 8:20 PM
Classroom: Pickard Hall 302
Instructor: Prof. Barbara Shipman (and Distinguished Teaching Professor 😊)
Office: Pickard Hall 437
Office Hours: Monday 11:30 – 12:45
Tuesday 2 – 3:15 and 5 – 6:30 PM
Wednesday 10 – 11:30 AM
Thursday 2:30 – 3:15 and 5 – 6:30 PM
You may also call or send me an e-mail with questions.
Phone: (817) 272-2606
E-mail: bshipman@uta.edu
Website: www.uta.edu/faculty/shipman – go to the Student Center, Math 3300, to view the daily class preparations and schedule.

Prerequisite: Math 1426 (Calculus I)


Learning Materials: I will post active learning materials that I am writing for Math 3300 on the website www.uta.edu/faculty/shipman/proof. These will be used during class and assigned as Class Preparations and Homework Projects.

Topics of the Course (with chapters from the textbook):
Logic – Chapter 1
Sets – Chapter 2
Mathematical Induction – Chapter 3
Relations – Chapter 4
Functions – Chapter 5
Selected topics from
Chapter 6: Elementary Number Theory
Chapter 7: Cardinality
Chapter 8: The Real Numbers

Learning Outcomes: Upon completion of Math 3300, students should be able to
- think critically about mathematical statements using sound principles of logic,
- decide whether statements involving the topics of the course are true or false,
- construct correct mathematical arguments to prove true statements about the topics of the course,
- create examples or counter-examples and apply them appropriately to prove or disprove statements about the topics of the course, and
- be confident about the correctness of their mathematical reasoning and proofs.
Bridge to higher-level thinking: This course is designed as a “bridge” to higher-level mathematical thinking to equip you with critical reasoning and communication skills for upper-level mathematics courses and for research and teaching in mathematics. An essential component of this bridge is to effectively communicate your reasoning verbally and in writing. You should find these skills useful in daily activities as well!

Active Learning: During every class meeting and between classes, you will be doing the talking and the thinking and the learning, prompted by interesting questions and reading about mathematics. Come to every class for stimulating interactions and debates with your classmates!

Office Hours: My office hours are to help you learn the material and guide you in finding answers to your questions. Please come by when you have questions; I’m happy to help.

Class Preparations (CP’s): A Class Preparation will be assigned at the end of each class to prime you for the discussions of the next class. Write up your CP according to the guidelines that follow, and hand it in at the beginning of the next class. These will provide material for the Oral Presentations. Since the CP’s will be discussed in class, they will not be graded in detail. Here is the scoring:

- 3: the work is complete and clear, and mostly correct,
- 2: the explanations are incomplete or hard to read, or there are more than a few small errors,
- 1: the work is sketchy or illegible or has several significant errors,
- 0: the preparation is not turned in or you are absent the day it is due.

Attendance: Come to every class meeting with your Class Preparation ready to hand in at the beginning of class. The CP’s also measure attendance. The CP score for a missed class is zero, and two lowest two CP scores will be dropped.

Oral Presentations: This course satisfies the “oral communication” component of the undergraduate mathematics major. During class, students will be called on to explain part of a Class Preparation or critique the write-up of a classmate, using an opaque projector. Each student will be called on up to one or more times per week to explain a proof or a solution to a mathematical question orally to the class, using the opaque projector and/or the board. The material for the Oral Presentations may come from the Class Preparations, the Homework Projects, or additional problems brought up during class. Each Oral Presentation will be given a score from 0 through 10 according to the following criteria:

- State the question before answering it.
- Speak clearly to the class and support your explanations with clear writing.
- Include complete steps and justification in your arguments.
- If you “get stuck,” that’s okay. State where the problem is and how you plan to find a way out.
- Carefully answer questions that your classmates may ask, and repeat the comment or question so that the whole class can hear it.
**Homework Projects:** Three written Homework Projects will be given, due on the dates listed below. I will grade and make comments on these and hand them back to you. You may come by during office hours to correct errors on the Homework Projects and gain back missed points, based on the clarity and correctness of your explanations. Points on a Homework Project may be gained back for up to two weeks after the date the Project is returned to you.

**Team Project:** This In-Class Team Project, scheduled for Tuesday, November 23, will help you prepare for the Final Exam. Details will be provided on Nov. 23, and the written Team Projects will be collected at the end of class.

**Guidelines for Class Preparations and Homework Projects:**
- In the upper right corner of the first page, write your name, “Math 3300,” and the date the work is due.
- Across the top of the first page, write the title of the assignment, for example, “Class Preparation – Online Activities #9 and #11” or “Homework Project #2.”
- Write out the complete question before presenting the solution.
- Be complete in showing the steps and justifications in all explanations and proofs.
- Write clearly in dark writing (pen or dark pencil) or type your work.
- Write on one side of the paper only for better viewing on the projector.
- Trim the edges from paper torn from a spiral notebook.
- Staple pages together in the upper left corner.
- You may discuss the course work with classmates, but your written work must be your own explanations in your own words.

**Exams:**
- An **Entry Exam** on logic, sets, relations, functions, and proof strategies will measure your reasoning skills on these topics when you enter Math 3300. This will help in guiding the activities and focus as we work through the course material.
- Three **Course Tests** during the semester will measure your progress in mastering the learning outcomes.
- The **Final Exam** will include an **Exit Exam** similar to the Entry Exam, which will provide a means to compare your reasoning skills in logic, sets, relations, functions, and proof strategies before and after the course. The Final Exam will also include a proof-writing component. It will be comprehensive, on material covered in the whole course.

**Grading:** Your work will be graded on correctness, completeness, and clarity.

- Attendance with Class Preparations: 15%
- Oral Presentations: 20%
- Homework Projects and Team Project: 15%
- Two Best (out of three) Course Tests: 30% (15% each)
- Comprehensive Final Exam: 20%

A course average of at least 90% guarantees an A, at least 80% a B, at least 70% a C, and at least 60% a D.
Missed Exams cannot be made up. One lowest Course Test score and two lowest Class Preparations will be dropped. Class Preparations are accepted only at the beginning of the class at which they are due. Homework Projects must be submitted by the due date for full credit. The Team Project must be completed as teamwork during the scheduled class time for full credit.

Important dates:

Aug 26            First class and Entry Exam
Sep 14            Homework Project 1 due
Sep 23            Course Test 1
Oct 12            Homework Project 2 due
Oct 26            Course Test 2
Nov  5            Last day to drop (automatic W)
Nov  9            Homework Project 3 due
Nov 18            Course Test 3
Nov 23            In-Class Team Project
Dec  9            Last class
Dec 16            Final Exam (Thursday) 8:15 – 10:00 PM

Advice for Succeeding in Introduction to Proofs:

1. Attend every class. You will not want to miss out on the interesting debates about True/False questions, concepts, and proofs. Regular attendance will help you immensely in learning the concepts and preparing for the exams, and it is an important part of your grade as well.

2. Work out all of the Class Preparations and Homework Problems. To do well in the course, most students may need to spend at least 10 hours per week (and probably more) studying, reviewing class notes, reading the textbook, and working on homework.

3. Come to office hours often to ask questions that come up as you study and prepare your homework. If enough students attend an office hour, we may move to another room so that everyone can work together.

4. Think about Math 3300 concepts and problems when you are doing things such as walking or eating. You don’t need to be sitting down with a pencil and paper to think about a problem. Good thinking can be done while doing something relaxing.

5. If you cannot put in enough hours per week outside of class or if TV, friends, work, etc. are taking away your needed study time, then change something now so that you will be able to do well in the class. Discussing mathematics with other students (but writing up your own proofs and explanations) will help you use your time more efficiently.
6. Come to the MAA meetings (UT Arlington's Math Club) every first and third Wednesday of each month at 12 noon in PKH 304 (or 308) for a free lunch and fun discussions about mathematics. (MAA = Mathematical Association of America.)

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. Students will not be automatically dropped for non-attendance. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. Contact the Financial Aid Office for more information.

Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the Americans with Disabilities Act (ADA). All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Academic Integrity: It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University. According to the UT System Regents’ Rule 50101, §2.2, "Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts."

Student Support Services Available: The University of Texas at Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. These resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals to resources for any reason, students may contact the Maverick Resource Hotline at 817-272-6107 or visit www.uta.edu/resources for more information.

Electronic Communication Policy: The University of Texas at Arlington has adopted the University “MavMail” address as the sole official means of communication with students. MavMail is used to remind students of important deadlines, advertise events and activities, and permit the University to conduct official transactions exclusively by electronic means. For example, important information concerning registration, financial aid, payment of bills, and graduation are now sent to students through the MavMail system. All students are assigned a MavMail account. Students are responsible for checking their MavMail regularly. Information about activating and using MavMail is available at http://www.uta.edu/oit/email/. There is no additional charge to students for using this account, and it remains active even after they graduate from UT Arlington.

To obtain your NetID or for logon assistance, visit https://webapps.uta.edu/oit/selfservice/. If you are unable to resolve your issue from the Self-Service website, contact the Helpdesk at helpdesk@uta.edu.