Introduction to Proofs
Math 3300-001 – Spring 2011

Time: Tuesday, Thursday 2:00 – 3:20 PM
Classroom: Pickard Hall 304
Instructor: Prof. Barbara Shipman (Distinguished Teaching Professor 😊)
Office: Pickard Hall 437
Office Hours: Mon. 9:30 – 11:30 AM, Wed. 2 – 4 PM
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 weekly assignments and schedule. Go to www.uta.edu/faculty/shipman/proof for the online course activities.

Prerequisite: Math 1426 (Calculus I)


Course Outline (with chapters from the textbook):

Logic, Language, and Sets – Chapter 1
Strategies of Proof – Chapter 2
Functions – Chapter 3
Relations – Chapter 4

Additional topics on infinite sets, cardinality, abstract algebra, discrete mathematics, and real analysis may be chosen from the remaining chapters of the text and from supplementary materials.

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.

Active learning and 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. During every class, you will be talking, thinking, and explaining your work and reasoning with your classmates. You should find the skills gained from this useful in daily activities as well!
**Prepared Attendance and Participation:** At the end of almost every class, you will be given a class preparation to complete and bring to the next class. You will be called on during classes to present and explain your solutions to class preparations, explain part of a class discussion, or critique the work of classmates. Sometimes the class preparations will be collected and viewed on the opaque projector for discussion. It is important to complete every class preparation and participate in every class to succeed in the course. An attendance/participation score will be taken at each class meeting, scored as follows.

- 2: for prepared attendance with good participation (well-explained answers when called upon and good interaction with peers during class activities)
- 1: if you arrive after class has begun, leave at any time during class, come unprepared, or if your participation is less than as described above
- 0: if you miss the class

Oral participation in this course satisfies the oral communication component of the undergraduate mathematics major.

**Team Homework:** Three written homework sets will be given, to be completed in teams of two or three as assigned, due on the dates listed below. Mistakes on the homework will be circled or otherwise indicated, and the homework will be handed back to you at the next class meeting. Many of these errors will be discussed and corrected in class. To prepare for the exams, you should re-write every homework problem with all errors corrected and come to office hours to check your work. Each homework assignment will receive a letter grade based on completeness, clarity, correctness, neatness, and timely submission of your work. In computing course grades, the following values will be used: A+(100), A(95), B(85), C(75), D(62), E(45), F(0).

**Guidelines for Team Homework:**
- Each team submits one paper, prepared by the team.
- Each team member must work on and discuss all of the problems with the team.
- Each team should meet for at least three hours outside of class to work on the project. On the cover sheet, record meeting dates, times, and members present.
- Include all hypotheses, steps and justifications in all explanations and proofs.
- Write your work in clear logical order, in complete sentences written in clear English with correct punctuation.
- Write clearly in dark writing (pen or dark pencil) or type your work.

**Exams:** Three Course Tests during the semester and a comprehensive Final Exam will measure your progress in mastering the learning outcomes.

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

- Attendance with Oral Participation: 15%
- Three Homework Projects: 20%
- Three Course Tests: 45% (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.
**Important dates:**

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<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Jan 18</td>
<td>First class</td>
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<tr>
<td>Feb 8</td>
<td>Homework 1 due</td>
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<tr>
<td><strong>Feb 17</strong></td>
<td><strong>Course Test 1</strong></td>
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<tr>
<td>Mar 14 - 18</td>
<td>Spring Break</td>
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<tr>
<td>Mar 8</td>
<td>Homework 2 due</td>
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<td><strong>Mar 24</strong></td>
<td><strong>Course Test 2</strong></td>
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<td>Apr 1</td>
<td>Last day to drop (automatic W)</td>
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<td>Apr 12</td>
<td>Homework 3 due</td>
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<td><strong>Apr 21</strong></td>
<td><strong>Course Test 3</strong></td>
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<td>May 5</td>
<td>Last class</td>
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<td><strong>May 10</strong></td>
<td><strong>Final Exam</strong> (Tuesday) 2:00 – 4:00 PM</td>
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**Advice for Succeeding in Introduction to Proofs:**

1. Attend and participate in every class, and work out each Class Preparation thoroughly before class. 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. 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. Discuss the concepts and homework regularly with your classmates and homework teams, and come to office hours to ask questions that come up as you study and prepare your homework.

4. Think about mathematics 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 308 for a free lunch and fun discussions about mathematics. (The MAA is the Mathematical Association of America.)
Policies of the University of Texas at Arlington:

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](http://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](http://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/](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/](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](mailto:helpdesk@uta.edu).