

**PRACTICAL INFORMATION**

Class hours: TR 9:30–10:50 pm  
Class room: MA 012  
Instructor: Lars Winther Christensen  
Office: MA 251  
Office hours: M 11:30–1:30 pm, T 11:00–1:00 pm, and R 1:00–2:00 pm, or by appointment  
E-mail: [lars.w.christensen@ttu.edu](mailto:lars.w.christensen@ttu.edu)  
Course homepage: [www.math.ttu.edu/~lchrste/teaching3310141.html](http://www.math.ttu.edu/~lchrste/teaching3310141.html)

**COURSE DESCRIPTION**

This goal of this course is to teach students how to construct and organize their mathematical reasoning and develop skills for writing mathematical proofs. It is a writing intensive course.

**Required text:** *Mathematical Proofs: A Transition to Advanced Mathematics*, 3<sup>rd</sup> edition by Chartrand, Polimeni, and Zhang; Pearson (2013).

**Prerequisites:** Math 2450 or consent of the department.

**Student learning outcomes:** The students are expected to understand and be able to use the following concepts:

- Sets (element, subset, union, intersection, product, cardinality)
- Functions (injective, surjective, bijective, composition)
- Equivalence relations (equivalence class, congruence module  $n$ , modular arithmetic)

The students are expected to become proficient in reading and writing mathematical proofs. To this end the following topics will be covered:

- ◇ Truth tables and logic (statements, negation, implications, quantifiers, logical equivalence)
- ◇ Direct proofs
- ◇ Contrapositive proofs
- ◇ Proof by contradiction
- ◇ Proof by cases
- ◇ Proof by mathematical induction

**LEARNING ASSESSMENT**

Graded assessment is done through homework, quizzes, and exams. Other assessment techniques will also be used; these include direct questioning, problems to be solved in class, and discussions during office hours. Additionally, problems will be assigned for student self-assessment. The homework problems will be assigned out of the textbook and focus on the concepts (●) listed above. They will be chosen such that they facilitate the students' development of skills in understanding and creating written mathematical argumentation. Exam problems will be constructed such as to test if the students have acquired the expected command of the concepts and developed the expected skills in mathematical argumentation.

## COURSE ORGANIZATION

Of the 42 scheduled class hours, 32 will be spent on lectures, 3 on in-class assignments, and 7 on quizzes, exams and review. The plan is to cover sections 1.1–1.4 (3.5 hours), 2.1–2.8 (6 h), 3.1–3.5 (3 h), 5.1–5.2&4 (2.5 h), 6.1–6.2&4 (3.5 h), 8.1–8.6 (4 h), 9.1–9.6 (4.5 h), 10.1–10.4 (3 h), 12.1–12.2 (2 h). Exact reading assignments are posted on the course homepage, which is updated after every class.

**Exams:** In-class exams take place on 9 Oct. and 18 Nov. The final is on 6 Dec, 7:30–10:00 am.

### Other important dates:

Last day to drop a course without penalty	10 Sep.
Last day to drop a course	27 Oct.
Last day to withdraw	26 Nov.
Thanksgiving Vacation	26–30 Nov.

## ASSIGNMENTS, GRADES, AND GRADING

Two in-class exams and three quizzes are given during the semester. Homework will be assigned 12 times during the semester and is due on Tuesdays. Students are encouraged to work together on the homework problems. Results and grades are posted at [www.blackboard.ttu.edu](http://www.blackboard.ttu.edu).

**Grading policy:** On exams and written homework, partial credit for correct steps will be awarded even if the final answer is wrong. Full credit will be given only if the final answer and all intermediate steps are correct. A correct final answer does not *per se* guarantee any credit.

**Deadlines and make ups:** Homework is not accepted after the deadline. In-class exams cannot be made up; the final exam serves as make-up for exams that were missed for legal reasons.

**Final grade:** Homework (10 assignments), quizzes (3), and exams (3) are counted towards the final grade with weights as follows: Homework 35% (3.5% ea.), quizzes 15% (5% ea.), in-class exams 30% (15% ea.), and final exam 20%.

## GENERAL POLICIES

**Academic integrity:** It is the aim of the faculty of TTU to foster a spirit of complete honesty and a high standard of integrity. Any attempt of students to present as their own any work that they have not honestly performed is regarded by faculty and administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension. Please see more information on-line at [www.depts.ttu.edu/studentjudicialprograms/academicinteg.php](http://www.depts.ttu.edu/studentjudicialprograms/academicinteg.php).

**Civility in the classroom:** You are expected to be courteous to me and your fellow students. This means that your cell-phone should be turned off during the class; you shall not chat with your friends during class, eat meals or snacks, or cause a distraction in any other way.

**Officially approved trips:** Students are allowed to miss class for trips officially sanctioned by TTU. The student must notify the instructor of upcoming trips and present written authorization.

**Religious holy days:** You are allowed to take the time to travel and observe a religious holy day. Prior notice should be given at least one week before the absence.

**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 to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office at 335 West Hall or 806-742-2405.