

**PRACTICAL INFORMATION**

Class hours: TR 12:30–1:50 pm  
Class room: MA 115  
Instructor: Lars Winther Christensen  
Office: MA 251  
Office hours: W 3:30–5:30 pm and R 9:30–10:30 am, or by appointment  
Phone: (806) 742-2580 x 366  
E-mail: lars.w.christensen@ttu.edu  
Course homepage: [www.math.ttu.edu/~lchrste/teaching5326091](http://www.math.ttu.edu/~lchrste/teaching5326091)

**COURSE DESCRIPTION**

This is the first course in the graduate algebra sequence; it covers fundamental concepts from ring theory and module theory.

**Required text:** “Abstract Algebra”, Third Edition by Dummit and Foote, John Wiley & Sons Inc.

**Prerequisites:** Basic knowledge of groups and rings: approximately the material covered in chapters 1–2 and 7 of the text.

**Expected learning outcomes:** After completion of the class, students should master the fundamental concepts of ring and module theory. Concepts include but are not limited to the following:

- Rings: rings of fractions, the Chinese Remainder Theorem, factorization in commutative rings, polynomial rings and algebras.
- Modules: standard functions and constructions, modules over principal ideal domains with applications to linear algebra, projective, injective, and flat modules.
- Commutative algebra: localization, primary decomposition, Hilbert’s Nullstellensatz.

**LEARNING ASSESSMENT**

Graded assessment is done through homework and exams. Other assessment techniques will also be used; these include direct questioning, and problems to be solved in class. Additionally, problems will be assigned for student self-assessment.

**COURSE ORGANIZATION**

The plan is to cover parts II and III plus some of part V in the text. Precise reading assignments will be posted on the course homepage after every class.

**Exams:** In-class exams take place on 8 Oct. and 19 Nov. The final is a 50 hour take-home exam, due on 10 Dec at 4 pm.

**Other important dates:**

Labor Day	7 Sep.
Student holiday	12–13 Oct.
Last day to drop a course	2 Nov.
Thanksgiving vacation	25–29 Nov.

## ASSIGNMENTS, GRADES, AND GRADING

Two (2) in-class exams are given during the semester. Homework will be assigned 12 times during the semester. Students are encouraged to work on the homework problems in groups.

**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 *per se* does not 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) and exams (3) are counted towards the final grade with weights as follows: Homework 40% (4% ea.), in-class exams 40% (20% 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/studentaffairs/CampusCrime/documents/integritymatters.pdf](http://www.depts.ttu.edu/studentaffairs/CampusCrime/documents/integritymatters.pdf).

**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 1 day 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 office 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.