

**PRACTICAL INFORMATION**

Class time: TR 11:00–12:20 pm  
Class room: MATH 017  
Instructor: Lars Winther Christensen  
Office: MATH 251  
Office hours: M 1:30–3:00 pm and R 2:00–3:30 pm or by appointment  
E-mail: [lars.w.christensen@ttu.edu](mailto:lars.w.christensen@ttu.edu)  
Course homepage: [www.math.ttu.edu/~lchrste/teaching5326171.html](http://www.math.ttu.edu/~lchrste/teaching5326171.html)

**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*, 3<sup>rd</sup> edition by Dummit and Foote, John Wiley & Sons Inc. (2004)

**Prerequisites:** Basic knowledge of groups and rings corresponding the material covered in chapters 1–3 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:

- Euclidean domains
- Principal ideal domains
- Unique factorization domains
- Polynomial algebras over fields
- Modules and their homomorphisms
- Constructions with modules: quotients, products, and sums
- Tensor products
- Exact sequences of modules
- Projective, injective, and flat modules
- Modules over principal ideal domains
- Linear algebra over principal ideal domains: canonical forms

**LEARNING ASSESSMENT**

Graded assessment is done through homework 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. Exam problems will be constructed such as to test if the students have acquired the expected mastery of these concepts.

## COURSE ORGANIZATION

Of the 28 class periods, 24 will be spent on lectures and 4 on exams and feedback. The plan is to cover sections 8.1–8.3 (4 class periods), 9.1–9.5 (5 c.p.), 10.1–10.5 (10 c.p.), and 12.1–12.3 (5 c.p.) Reading assignments are posted on the course homepage, which is updated after every class.

**Exams:** In-class exams take place on Tuesday 3 October and Thursday 2 November. The final exam is on Friday 8 December, 1:30–4:00 pm.

### Other important dates:

Last day to drop a course without penalty	13 September
Last day to drop a course	30 October
Thanksgiving Vacation	22–26 November
Last day to withdraw	1 December

## ASSIGNMENTS, GRADES, AND GRADING

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

**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. Make-up exams are only given if the original exam was missed for a valid, university approved, reason.

**Final grade:** Homework (10 assignments) and exams (3) are counted towards the final grade with weights as follows: Homework 50% (5% ea.), in-class exams 30% (15% ea.), and final exam 20%.

## GENERAL POLICIES

**Academic integrity:** It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension. “Scholastic dishonesty” includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student or the attempt to commit such an act. See [www.depts.ttu.edu/opmanual/OP34.12.pdf](http://www.depts.ttu.edu/opmanual/OP34.12.pdf).

**Students with disabilities:** Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services (SDS) during the instructor’s office hours. Please note: instructors are not allowed to provide classroom accommodations to a student until appropriate verification from SDS has been provided. For additional information, please contact SDS in West Hall or call 806-742-2405. Please see more on-line at [www.depts.ttu.edu/opmanual/OP34.22.pdf](http://www.depts.ttu.edu/opmanual/OP34.22.pdf)

**Religious holy days:** Students are allowed to take time to travel and observe a religious holy day as detailed in [www.depts.ttu.edu/opmanual/OP34.19.pdf](http://www.depts.ttu.edu/opmanual/OP34.19.pdf). Note that prior notice must be given to the instructor in writing.