

## **MTH-481/MED-581 Modern Algebra for Teachers**

Winter/Spring 2005

University of Detroit Mercy

Department of Mathematics and Computer Science

Lecture: Mondays, 6:40pm-9:10pm, Room E120

Instructor: Abhijit Dasgupta

Office: E254

Phone: 313-993-1062

Email: abhijit.dasgupta@udmercy.edu

Office Hours: Mondays: 4:00pm-5:30pm, Tuesdays and Thursdays: 3:00pm-

4:30pm, and anytime my office door is open. Or, email, call, or talk to me in

person to schedule an appointment.

### **Textbook**

*Elements of Modern Algebra* by Jimmie Gilbert and Linda Gilbert, 6th edition, Thomson Brooks/Cole, 2005.

### **Course Description**

Credit applies only in math education. Mappings, operations, inverse mapping, and permutations. The integers - induction, divisibility, congruence. Rudimentary introduction to coding theory and cryptography. Groups. Rings. Integral domains. Fields. The Real and Complex Fields.

### **Course Outcomes**

After taking this course, students will be able to:

1. Get a basic conception abstract algebraic thinking.
2. Have concrete understanding of integers, modulo arithmetic, and prime numbers, appropriate for computing and programming as well as coding theory and cryptography.
3. Solve problems involving various mathematical structures with operations, such as groups, rings, and fields.
4. Carry out rigorous deductions (proofs) of general theorems about particular algebraic systems from axioms for that system.
5. Have a deeper understanding of the algebraic nature of the integers, divisibility, and the real numbers needed for mathematics education.

### **Final Exam**

The final exam will be on Monday, April 25, 7:30pm-9:20pm. Note that the exam time is different from that of the lecture. It will be a comprehensive (cumulative) exam, and is mandatory for determining your overall grade. The final exam score cannot be replaced by any of the test scores.

### **Grading Policy**

Homework and Quizzes: 10%

Two midterm tests: 60% (50% for graduate students)

Final Exam: 30%

No make up exams will be given. However, a final exam score which is higher than the lowest test score will replace the lowest test score. A missed test will count as the lowest test score.

Graduate students must do additional work (10%) to pass this course. To determine what this work will be, every graduate student must see me in person by the end of the second week and arrange possible assignments. It will be 10% of the final grade.

Grading Scale: A: 90 or above B: 75-89 C: 60-74 D: 50-59

Letter grades may be appended with a '+' or a '-' if the score is close to the boundary of the next (adjacent) higher or lower letter grade score range.

### **Tentative Schedule** (subject to change)

Week	Date	Material/Activities
1	Jan 10	Chapter 1, Chapter 2
2	Jan 17	ML King Day (No class)
3	Jan 24	Chapter 2
4	Jan 31	Chapter 2
5	Feb 7	Chapter 3
6	Feb 14	Chapter 3
7	Feb 21	Test 1, Chapter 4
8	Feb 28	Chapter 4
9	Mar 7	Spring Break (No class)
10	Mar 14	Chapter 5
11	Mar 21	Chapter 5
12	Mar 28	Chapter 6
13	Apr 4	Chapter 6, Chapter 7
14	Apr 11	Test 2, Chapter 7
15	Apr 18	Final Review
16	Apr 25	Final Exam 7:30pm

### **General Policy**

1. You are encouraged to ask questions!
2. Working out the homework assignments will be an integral part of learning the material in the course.
3. Everything in this document (including the course description, the class/test schedule, and the grading policy) is subject to change.

### **Important Dates**

January 17	Martin Luther King Day (No Classes)
February 4	Last Day to Drop a Course Without a W
March 7-12	Mid-Winter/Spring Break (No Classes)
April 1	Last Day to Withdraw From Class
April 25	Final Examination starting at 7:30pm

**Academic Integrity**

Students are expected to conform to a high standard of honesty and integrity in this course. Any kind of cheating or unfair means to perform in this course (or permitting or helping someone to do so) will result in an automatic zero score for that assignment or test. In addition, the student will be reported to the proper university authority for appropriate action. (See the University Catalog and the Engineering and Science Student Handbook for details.)