

MATHEMATICS 310
MODERN ALGEBRA I
SECTION A - FALL 2001

Instructor: Prof. Ted Sundstrom **Office:** 2268 Mackinac Hall

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Instructor's Home Page: <http://www2.gvsu.edu/~sundstrt/>

Class Schedule: M W F 12:00 - 12:50 1119 Mackinac Hall

Office Hours: To be announced later.

Prerequisite: MTH 210, and MTH 227 or MTH 225.

Textbook: *Abstract Algebra, an Introduction*, second edition, by Thomas W. Hungerford, Saunders College Publishing, copyright 1997, 1990.

Course Description: Algebraic properties of the and development of the rational, real, and complex number systems as algebraic structures. Topics from modern algebra include rings, integral domains, fields, and ring isomorphisms. Further study of algebraic structures using congruence arithmetic and factorization in the ring of integers and polynomial rings.

Computer Software: The computer software package MAPLE V for Windows will be used by the instructor in this course and is available for student use the computer labs.

Internet Access and Student e-mail: Most of the materials and information for this course will be posted to the course homepage. This homepage is part of one of Grand Valley's internet sites called "GVSU Blackboard" The internet address for the GVSU Blackboard System is <http://bb.gvsu.edu>. (A link to this page is also on the instructor's home page.) In addition, the course schedule and assignments will be posted on this homepage. Students are also expected to use the e-mail provided by GVSU as the instructor will frequently send e-mail messages to the entire class.

Absences: Students are responsible for material covered and announcements made during absences from class. Since material that is not in the text will be presented in class, it is advised that students miss as few classes as possible.

Tentative Course Outline:	Chapter 1	Arithmetic in \mathbb{Z} Revisited.
	Chapter 2	Congruence in \mathbb{Z} and Modular Arithmetic
	Chapter 3	Rings
	Appendix D	Equivalence Relations
	Section 9.4	The Field of Quotients of an Integral Domain
	Chapter 4	Arithmetic in $F[x]$
	Chapter 5	Congruence in $F[x]$ and Congruence Class Arithmetic
	Chapter 15	Geometric Constructions

Homework: Daily reading and problem assignments will be made and homework will be reviewed in class. These homework assignments will not be collected.

Homework Assignments: There will be several homework assignments that will be collected and graded. These Homework Assignments are an essential component of this course and will be a major factor in determining grades for the course. The problems on the assignments will mostly be proofs which must be written according to the guidelines for the course (to be distributed in class). Basically, the proofs will be graded on the quality of the writing, the quality of the mathematical content, and the logical organization of the writing. Each Homework Assignment will be worth 25 points. The lowest homework score will be dropped, and the remaining scores will be averaged to count 200 points toward the final grade.

Team Project: There will be project for this course. For this project, each student must work in a team of three students. Each team will hand in one written report for the project and each member of the team will receive the same grade. The team assignment will be graded on a 75 point basis. Details about this assignment will be distributed later in the semester.

Tests: There will be two tests each worth 100 points. An attempt will be made to schedule the tests uniformly throughout the semester. This means that the first test will occur during Week 6 or Week 7, and the second test will occur during Week 11 or Week 12. The date of each test will be announced in class at least one week in advance. No make-up tests will be given without permission from the instructor prior to the date of the test.

**Writing,
Using a Word
Processor, and
Electronic
Submission of
Assignments:**

Writing is an important part of communicating mathematical results. The homework assignments, tests, and team project will require you to write solutions to mathematical problems. Writing mathematical solutions means more than writing formulas and circling an answer. It requires explanations of all significant steps taken in the solution of a problem. These explanations must be written in complete sentences and paragraphs with appropriate formulas and graphs included. The grading of the writing assignments will be based on the quality of the writing, the quality of the mathematical content, and the logical organization of the writing.

Students will be required to use word processing/typesetting software for the written Homework Assignments and the Team Project. If you do not have ready access to the student network, you should make sure that you have access to software that is capable of typesetting mathematics (for example, Microsoft Word with its Equation Editor).

Students will also be required to submit their Homework Assignments and Team Projects using the Digital Drop Box for the MTH 310 Home Page in the GVSU Blackboard System. The Digital Drop Box is located in the Tools Section of the Course Home Page.

**Final
Examination:**

The final examination will be a comprehensive test worth 150 points. It will be given on Wednesday December 12, 2001 from 2:00 p.m. to 3:50 p.m.

Grading:

Grades will be determined by the scores on the reading assignments, quizzes, lab assignments, skills test, portfolio problems, tests, and final examination according to the following scale:

Grade	Minimum Score	Grade	Minimum Score
A	90%	C+	74%
A-	87%	C	70%
B+	84%	C-	67%
B	80%	D+	64%
B-	77%	D	60%