

# Mathematics 310 – Modern Algebra I

## Section B – Fall 2003

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

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**Instructor's Home Page** <http://www.faculty.gvsu.edu/sundstrt/>

**Class Schedule** M W F 10:00 – 10:50 2050 Mackinac Hall

**Office Hours** Mon. 1:00 – 2:00      Thur. 11:00 – 12:00  
Wed. 1:00 – 2:00      Fri. 9:00 – 10:00

**Prerequisite** MTH 210; and MTH 227 or MTH 225.

**Textbook** *Abstract Algebra*, by Lawrence E. Spence and Charles Vanden Eynden.

**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.

**Course Objectives**

- To explore the algebraic concepts listed in the course description and course content on the previous page.
- To instill an appreciation of the rich algebraic structure of our familiar number systems.
- To develop each student's understanding of the broad scope of algebraic ideas contained in other mathematics courses.
- To improve the quality of communication in mathematics begun in previous courses.
- To advance each student's ability to handle abstract mathematical ideas and to appreciate their importance.
- To provide opportunities for the development of talents for creative thinking, problem solving, and writing proofs.

**Internet Access and Student e-mail** Most of the materials and information for this course will be posted to the course home page. 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.)

**Students are expected to check the course home page daily since the course schedule and assignments will be posted on this home page. 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.**

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

**Preview Assignments** During the semester, several preview assignments will be made. These will be short assignments that will be distributed in class (and posted on Blackboard) and will be due before the start of the next class. Grading of these assignments will not be based on whether or not everything is correct, but rather on whether or not a serious and substantial effort was made to complete the assignment. Each preview assignment will be graded on an 8-point basis.

**Individual Assignments and Team Assignments** During this course, students will be expected to develop and clearly write mathematical proofs. There will be four Individual Assignments and two Team Assignments made during the semester. These assignments will consist of written solutions to selected problems and exercises from the text and/or supplemental problems. These assignments will require you to make a significant effort to communicate your results and procedures for obtaining the results in writing. They will be graded on the basis of both content and the quality of the mathematical writing.

Tentative due dates and point values for the individual assignments are:

	Points	Distributed	Due Date
Assignment #1	25	Fri. Aug. 29	Mon. Sept. 22
Assignment #2	50	Mon. Sept. 22	Mon. Oct. 17
Assignment #3	50	Fri. Oct. 17	Fri. Nov. 7
Assignment #4	25	Fri. Nov. 7	Mon. Nov. 24

Tentative due dates and point values for the Team Assignments are:

	Points	Distributed	Due Date
Team Assignment #1	75	Wed. Sept. 3	Fri. Oct. 21
Team Assignment #2	75	Mon. Oct. 17	Wed. Dec. 3

The Team Assignments will consist of a set of problems and must be completed by teams of two or three students. Each team will hand in one set of solutions to the problems and each member of the team will receive the same grade. Details about this assignment will be distributed later in the semester.

**Honor System** All work that you submit for Individual Assignments must be your own work. **This means that you may not discuss the Individual Assignments with anyone except the instructor of the course and may not use any resources other than the textbook.**

All work that is submitted for Team Assignments must be the work of the team. **This means that each team member may not discuss the Team Assignments with anyone except the team members and the instructor of the course and may not use any resources other than the textbook. It also means that all students on the team are to contribute to solutions.**

Students may complete the assignment by collaborating on all parts or by delegating different parts to different team members keeping in mind that one part of the assignment often depends on earlier parts of the assignment.

**Writing, Using a Word Processor, and Electronic Submission of Assignments:** Writing is an important part of communicating mathematical results. The assignments and tests 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 Individual Assignments and the Team Assignments. Microsoft Word and its Equation Editor, which is available on the student network, is one such word processor.

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

**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 5 or Week 6, and the second test will occur during Week 10 or Week 11. 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.

**Final Examination** The final examination will be a comprehensive test worth 150 points. The final exam is scheduled for Tuesday December 9, 2003 from 12:00 p.m. to 1:50 p.m.

**Grading**

Grades will be determined by the scores on the preview activities, assignments, portfolio, mid-term examination, 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%