

**Instructor:** Ted Sundstrom      **Office:** 2268 Mackinac Hall  
**email:** sundstrt@gvsu.edu      **Phone:** 331-2041

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

**Class Schedule:** Tu Th 10:00 - 11:15 in Room 2322 Mackinac Hall

**Office Hours:**      Mon. 1:00 - 3:00      Tue. 2:00 - 3:00  
                             Wed. 11:00 - 12:00      Thur. 2:00 - 3:00

**Prerequisites:** MTH 210; and MTH 227 or MTH 225.

**Required Textbooks:** *Abstract Algebra*, by Lawrence E. Spence and Charles Vanden Eynden. (Available as a course pack at the bookstore.)

*Course Pack for MTH 310 Section A* available at the bookstore.

**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.
- 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.

## Grading for the Course

### Preview Assignments (10% of the course grade)

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 4-point basis.

**Assignments (30% of the course grade)**

There will be several assignments that will be collected and graded. These 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 problem on an assignment will be graded on a 20 point basis, and the lowest score on a problem for each student will be dropped.

**Team Assignments (20% of the course grade)**

There will be two Team Assignments made during the semester. 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. These assignments will require each team to make a significant effort to communicate their 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. Details about this assignment will be distributed later in the semester.

**Mid Term Exam (20% of the course grade)**

There will a mid-term exam tentatively scheduled for Tuesday February 26, 2008. No make-ups for this exam will be given without permission from the instructor prior to the date of the test.

**Final Examination (20% of the course grade)**

The final examination will be a comprehensive test. The final exam is scheduled for Wednesday April 23, 2008 from 8:00 a.m. to 9:50 a.m.

**Course Grades**

Grades for the courses will be no lower than the grades determined from the following scale:

Grade	Minimum Score	Grade	Minimum Score
A	93%	C+	77%
A-	90%	C	73%
B+	87%	C-	70%
B	83%	D+	67%
B-	80%	D	63%

## **Expectations for the Course**

This is a required course for the mathematics major. You will be expected to spend a great deal of time writing and rewriting your assignments, and you will be responsible for the mathematical content in this course. The most important rule for this course is that **you cannot get behind in your work!! Always stay up to date with the material in this course. Make succeeding in this course a priority.**

## **Honor System and Academic Honesty**

It is expected that students will not have given nor received unauthorized aid in any work that is submitted for a grade in this course. Please refer to and carefully read the policy on academic honesty and plagiarism included at the end of this syllabus. Note the penalties for such behavior in the course. On every assignment, I reserve the right to discuss the nature and origins of your work with you prior to awarding a grade on the work.

## **Attendance**

Because this is a discussion-based course, attendance in class is critical to your success in this course. You are expected to be present and on time each day we meet. You are responsible for announcements made in class concerning material covered, assignments, changes in the syllabus or due dates, or anything else pertinent to the course.

## **Preparation and Participation**

It is imperative that you work on a consistent basis. This applies to both the day-to-day work to prepare for class as well as the more long-term work such as the assignments and projects. You should keep a well-organized record of your study notes, completed problems, and problems in progress for future reference. You must understand that a great deal of your learning in this course must occur on your own. It is your responsibility to do the preview assignments, read the text, do the problems, be prepared for class, and to seek help as needed.

## **Due Dates**

All due dates for the course will be strictly enforced. It is expected that all assignments will be turned in by the due date. No late work will be accepted without prior approval from the instructor.

## **Internet and Student Email**

Most of the materials and information for this course will be posted to the course home page. This home page 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.**

### **Graded Work and Mathematical Typesetting**

I expect your very best work on all graded assignments. All course writing should adhere to the writing guidelines and principles established in MTH 210. Writing is an important part of communicating mathematical results. The assignments, tests, and team assignments 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 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 assignments and the team assignments. 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). Following are some specific writing guidelines for this course.

1. For the Preview Assignments, you may choose to either provide well written work using pen or pencil. Please use loose-leaf paper, rather than the fuzzy stuff from a spiral bound notebook. Submissions with more than one page must always be stapled (with one staple in the upper left corner), not paper-clipped or otherwise connected.
2. The assignments and projects must be typeset. You may choose to use the Equation Editor in Word to enter mathematical symbols, and you are required to use correct mathematical notation and syntax as demonstrated in the text and in class. For some, the mathematical typesetting language LaTeX may provide a more appealing alternative to Word.
3. For problems on the assignments, be certain that a statement of the problem you are solving is included before you begin your solution. (This is often given in the form of a proposition or theorem.) Ideally, you will provide this in your own words. In all cases, the solution of the problem must be given in context so that anyone reading the problem knows what the question is without access to the original problem statement. Never start a problem with the phrase “Prove that . . .,” or its equivalents.
4. In every graded assignment, reasoning counts! While “the” answer is important, I consider how you found your answer even more important. In every graded response in the course (assignments and exams), you are expected to document your reasoning and demonstrate an argument that justifies your conclusion.
5. If you use a theorem/result from our books, cite it by name or number, including the page on which it was found. If you look up a result from a previous class, clearly cite where the result came from in your notes or textbook.

6. It is always essential that you use proper grammar, complete sentences, and correct spelling. Always proofread your work thoroughly. Use a spell checker for work that is done using a word processor.
7. On any assignment, **if you collaborate with peers, please clearly indicate their names on the paper next to the relevant problems or ideas in which they were involved.** See the statement on academic honesty for permitted forms of collaboration.
8. Overall, the expectation is that, in every assignment, you will strive to implement the professional mathematical writing standards that we teach and learn in MTH 210. In each case, your very best work is expected. If you have any questions about how to present an idea or result, I would be glad to discuss that with you at any time prior to when the assignment is due.

## Academic Honesty and Plagiarism Policy

All of the work that you complete as part of the graded requirements for this course must be your own. I am interested in what you think of the subject, both on matters opinion-related (such as the essays) and matters proof-related (such as the assignments). In everything that you write, I will be looking to find your personal understanding and development in the course of studying the material. To be clear, I have no interest in you emulating the work of one of your classmates, replicating the efforts of a student from a prior semester in MTH 310, nor in work taken from an external resource such as a textbook or Internet site. All of this is to say that your work must be completed with the highest level of academic honesty and integrity, and that plagiarism will not be tolerated.

This document establishes our guidelines for the semester regarding academic honesty and plagiarism, hopefully setting appropriate boundaries for each student so that we can achieve the goals stated above for personal learning and understanding. This policy is in effect for all students in MTH 310 for the duration of the term. Please be sure to read it carefully and to honor it accordingly.

**Plagiarism** is the act of submitting the work of someone else as if it were your own. Specifically, this action intends to mislead the instructor to think that the work is the result of learning accomplished by the student named on the paper.

(For example, Dr. Matt Boelkins originally wrote the material on expectations and on plagiarism in this syllabus for MTH 495. I have modified it for this course, but since the material that Dr. Boelkins wrote is very well suited for most courses, I decided to use his documents rather than writing something new.)

While there are many terrible things about plagiarism, the worst may be that committing the act once will call into question all of your work in a course. In addition, in an environment where students engage in academic dishonesty, the instructor is forced to look at everyone's work and question it. This is particularly unfair to the students who are doing honest work.

The following are guidelines for avoiding plagiarism in course assignments. The list is representative, but not exhaustive. Evidence of such behavior on any assignment will be grounds for a minimum penalty of zero on the entire assignment. In severe cases, the penalty will be failure of the course. In all cases, the guidelines established in the GVSU catalog and GVSU student code will be followed. I reserve the right to discuss the nature and origins of any assignment with you prior to awarding a grade on the paper.

1. On the assignments and team assignments, every sentence that you write should be one that you have generated yourself and that you understand. While you are permitted to collaborate on big ideas and hints on problems with classmates, **you must be working alone when you write your solutions.** All collaboration must occur only with students in this class who are currently at the same stage of problem solution as you.

To be clear, suppose that you asked 4 different students in the class "How did you do problem 4?" You did this at a time when you had made no personal progress on the problem, and you asked until you found someone who both had the problem completed and was willing to give you a route to the solution. Such an act constitutes plagiarism, for the work is simply not your own. On the other hand, it is entirely fine to work with one or two peers who are similarly stuck and to "put your heads together."

Please remember that your instructor is generous with hints and is always willing to discuss problems with you. While I will never simply give you the answer, I will offer direction and guidance that will assist you in coming to a solution on your own.

2. On the assignments, the primary resources you should use are the textbooks and the course pack for the course. If you look up relevant review material from a past mathematics course (e.g. calculus or MTH 210), you should cite the book you used and the specific pages you considered. You are not, however, permitted to go looking for completed solutions to current homework problems in any other texts or resources.

***In particular, using the Internet is completely off limits for assignments and team assignments. Evidence of using Internet sources in your work will result in a minimum penalty of failure of the assignment.***

3. On the team assignments, you are working as part of a team. As such, it is assumed that each team member is doing roughly the same amount of work. While it is impossible to make the workload exactly even, it should not be the case in your project that, say, one person did 60% of the work and the other two did 20% each.

If the workload is unevenly distributed, it is the responsibility of each person in the group to divulge this to me on their peer and self-assessment. This is especially so for the person not contributing their fair share to the work. In this event, individual project grades will be adjusted appropriately. **It is an act of plagiarism if you put your name on a project paper on which you have not made substantial contributions.**

4. On any assignment, it is an act of plagiarism to base your work on the efforts of a friend or acquaintance who has completed the course in a prior term. Be advised that in many instances, other instructors have kept copies of essays, homework assignments, and semester projects and I will be able to access them. I am well aware that students often share past exams, homework assignments, and more with one another. But, such sharing strives to defeat the point of the course for those of you registered this term, and therefore is not permitted. If you have any such materials in your possession, please return them immediately to their rightful owner. Use of such materials in your work this semester is grounds for failure of the course.

Again, the entire point of any course is for you to learn, grow, and mature as a student. Such development can only happen in an environment of academic honesty. I expect that each of you will adhere to these guidelines and that you will play active roles in encouraging your peers to do likewise. At any time, you are welcome to discuss with me questions or concerns that you have regarding this policy, your own work, or the work of your peers.