

MAT 2190 (Honors Section): Finite Mathematics

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1. COURSE CONTENT

Text: *Finite Mathematics*, by Goldstein, Schneider, and Siegel (11th ed.)

Systems of linear equations, linear programming, combinatorics (counting theory), probability, and related topics, with applications to business and social science. *Prerequisite*: MAT 1271 with grade of C or better, or satisfactory placement, and admission to University Honors.

2. OBJECTIVES

The most general and important objective of this course is that you understand the material covered, rather than only memorizing formulas and following procedures as directed. The word *understand* is quite vague, so let me explain what I mean: you understand a concept when you can explain it in your own words and can apply it to solving problems *substantially different* from those you have previously been given as examples. Since this is a mathematics course, understanding includes the ability to read and write in the language of mathematics, interpreting the meaning of mathematical statements and problems, and expressing your solutions to problems, correctly and with precision. *Deep understanding is not easy to achieve and only comes with time and thoughtful effort, so don't get discouraged! Do plan to devote substantial time to your study of this course!*

More specific objectives will become apparent as we cover the material of the course.

3. HOW TO READ MATHEMATICS: SOME SUGGESTIONS

Try to visualize the ideas for yourself as you read. Make comparisons and analogies to things that are familiar, and think about how the new ideas relate to what you have already learned.

Mathematics is difficult to read! Avoid getting bogged down in a swamp of technical details! *The trick is to recognize that the technical details are motivated by simple basic ideas; get a sense of these ideas before verifying the technical details, in order to place them in context.*

When you read the examples, *don't try to memorize the procedure that is used*; instead, *think about the purpose of each step, and also think about the overall strategy that motivates the steps and binds them together in a logical sequence*, so that you will understand how to do new problems.

4. HOW TO PARTICIPATE IN CLASS: SOME SUGGESTIONS

Many people find that note-taking focuses their attention, but do not let note-taking distract you from thinking about the material being presented. It is not necessary, and generally not desirable, to get everything down. All of the essential material is in the textbook; if you have read the section in advance (as you should have), you will know what additional pointers you might want to write down. In taking down an example, do not struggle to write down every algebraic step: at this point, you should know how to do algebra, so just leave room to fill in any missed steps later. (And you can always come to my office to ask about anything you cannot fill in.)

Always go over your notes before the following class, filling in any missing details, adding marginal notes, and making sure you understand what you have written. If you have questions, ask them at the beginning of the following class or come to my office. (I will usually ask for questions at the beginning, but if I forget to do that, ask your questions anyway!) Be neat, organized, and thorough - it really helps a lot!

I realize that some of you have failed to do these things in the past and find it difficult to get in the habit of doing them, because I myself had this problem as an undergraduate. (High school was easy for me, so I never had to pay attention to how I studied.) When I started doing them, it was as if a bright light went on in my mind, and my success level jumped from mediocre to ... well, I got a Ph.D., after all! *I cannot overemphasize how much difference these good study habits make.*

Finally, *never hesitate to ask a question in class. Really! Ask!*

5. REQUIREMENTS & GRADING

5.1. Homework & Quizzes. Homework will regularly be assigned, and questions on the homework will be regularly addressed in class. You may sometimes need to do additional problems for practice. *You must take responsibility for doing the homework thoroughly and on time. I expect you to keep up; therefore, I will not answer questions in class on an assignment after the due date (except during review periods). Come to class prepared with questions at the beginning!*

Homework will be assigned at the beginning of each week. You are expected to be complete the assignment by the following Monday. There will be a practice quiz each Monday, based on the homework material, and a quiz the following Friday, on the same material, except during weeks when we have a comprehensive exam.

You are expected to explain the process used to solve each homework problem in clear, grammatical, and logical sentences, organized logically into paragraphs if necessary, using proper English and mathematical notation. The grading of quizzes will reflect this expectation. Solutions to quiz and exam questions must be clearly presented and justified in order to receive credit. You must show the method by which you did the problem. I am VERY STINGY with partial credit. (However, I am very forgiving about small careless errors.)

I encourage you to work in groups and discuss the homework problems with your classmates; however, you should write out the solution to each problem completely on your own. Otherwise, you won't know if you really understand how to do it. Cooperation is far more effective than slogging it out on your own. Also, the experience of explaining things to other people and finding their mistakes will improve your own understanding. *I strongly advise forming a study group of 2-6 people that meets regularly to work on this course. Gobs of research shows that students who belong to a regular study group do better than those who don't. (It stands to reason, doesn't it?)*

5.2. Exams. There will be *two exams before final exam period*, one near the middle of the term (the *mid-term exam*) and one near the end of the term (the *end-of-term exam*). The mid-term exam will cover all of the material since the beginning of the course; the end-of-term exam will cover all material since the midterm exam.

There will be a *comprehensive final exam*, covering all the material of the course, at the scheduled time during exam period.

Make-up exams will be given only under extraordinary circumstances or in case of serious emergency; prior permission to miss an exam must be obtained from the professor if at all possible.

5.3. Grading. The requirements count toward your grade as follows: quizzes, 40%; exams during the term, $2 \times 20\% = 40\%$; final exam, 20%. To make it easy for you to keep track of how you are doing, each quiz will be worth 40 points, and I will count the best ten of them, each exam during the term will be worth 200 points, and the final will be worth 200 points. (If for some reason we have fewer than ten quizzes, I will count your best score multiple times. But we will probably have at least ten.) Thus, you can use a total of 1000 points as your benchmark.

I do not grade on a "curve"; an average of at least 90% is required for an A, at least 80% for a B, and so on. Thus, your grade will not depend on how how your fellow students do. If you do a good job of learning the material, you will receive a good grade, regardless of how well the other members of the class perform. Don't forget that the reverse is also true: if you do a poor job of learning the material, you will receive a poor grade, regardless of how poorly everyone else does.

Complete honesty on assignments and exams is expected.

6. DISABILITY SERVICES

If you have a documented disability and are in need of accommodation, please contact the Office of Student Disability Services (OSDS), Ninth Street Hall, Room 2006, (217) 581-6583. All accommodations must be approved through OSDS.