

Syllabus

Algebraic Structures

Math 441, Fall 2009

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Honor Code: For the tests in this class you must not give or receive any aid. For the homework and workshops you are encouraged to work with other students, but the work you turn in should be in your own words and should be understood by you.

Textbook: There is no textbook for this class. If you would like to have a textbook to consult, I would recommend *Abstract Algebra* by Thomas Hungerford. This will cover all the material in our class, in roughly the same order.

Additional material:

1. Articles. I will assign some reading about history and/or the mathematicians who created some of what we’re studying.
2. L^AT_EX guide. There will be two guides in the computer lab KH318.

Grade Breakdown: Your grade will be based on the following percentages for each category of the course.

Homework	Quizzes	Midterm	Final exam
35%	10 %	20%	35%

To calculate your grade you take your average in each category, multiply it by the percentage that category is worth, and add these up. Here’s an example

$$\begin{array}{rcccc} \text{Your scores} & \text{HW} & \text{Quizzes} & \text{MT} & \text{FX} \\ & 83\% & 75\% & 75\% & 90\% \\ \text{Your grade} & .35(.83) & + .1(.75) & + .2(.75) & + .35(.9) = 0.8305 \end{array}$$

So what do I do with the total percentage? Here’s how the breakdown works:

$$\begin{array}{cccc} \text{A} \geq 93 & \text{B+} \geq 87 & \text{C+} \geq 77 & \text{D} \geq 60 \\ \text{A-} \geq 90 & \text{B} \geq 83 & \text{C} \geq 73 & \text{F} \geq 0 \\ & \text{B-} \geq 80 & \text{C-} \geq 70 & \end{array}$$

Homework:

Your homework grade has three kinds of problems.

Math problems: The homework for this course will be fairly standard: written solutions of problems and proofs of logical statements. As a rule everything should be logically complete. Thus, every statement should be justified, complete sentences should be used, “proofs by example” do not get full credit and assertions that something is *not* true should be backed up with an example. I will try to make it due every week.

I will allow one problem to be rewritten for credit on each assignment. This will replace your original score on a problem with the re-written score. To get full credit, the re-write must be turned back in to me within two business days of you getting back the first graded version.

Readings: I gathered together various articles about topics and/or mathematicians related to material from our class. Each week I’ll assign something from the reader. Your task will be to (1) read the assignment, (2) Write a paragraph about it, (3) be prepared to discuss it in class. I think this material is really interesting, and a lot of it is entertaining too! I’ll provide more details later.

L^AT_EX: L^AT_EX is a computer package for making beautiful mathematics (and other documents, like this one). It is a language, kind of like html (the code webpages are written in), which describes the document. No prior experience with L^AT_EX is assumed, I will hand out a complete guide, and help you learn it.

As far as the grading goes, there's a good chance that everyone will get 100% on the L^AT_EX. I will probably have you do one problem per week in it, as well as contributing to the class notes (on the L^AT_EX wiki). For the first assignments, you will get full credit just for producing anything that looks right. After a few assignments, I will start requiring that you do things "right"; of course, I'll explain what this means.

Quizzes: The quizzes are going to be on statements of results and definitions. These things form the basic vocabulary of algebra and the quizzes will help you master this. They should be pretty easy.

Tests: We will have one midterm and a final exam. I will try to write them so that most problems are similar to homework problems. However, I might have one "new" type problem on each test, just to "test" you.

Office Hours: I'll have regularly scheduled office hours, but at first I'll wait and see what time you guys like to come to my office.

Disabilities: I will happily accommodate any needs you have based upon a disability that is registered with the office of Disability Support Services (DSS). You need to contact me ahead of time for this accommodation. You can contact DSS at 410-617-2062, or mwiedefeld "at" loyola.edu.

Course outline: We're going to learn about the integers \mathbb{Z} , the modular integers \mathbb{Z}_n , rings, the complex numbers \mathbb{C} , polynomial rings $\mathbb{F}[x]$, and some applications of these ideas, especially to cryptography.