

PROFESSOR: Janice Sklensky, SC 109, x 3973  
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OFFICE HOURS: M 12:00-1:00, Tu 12:30-2:00, W 12:00-1:00, Th 12:30-2:00, and F 12:30-1:30. Additional meetings, of course, are available by appointment.

COURSE MATERIALS: *Contemporary Abstract Algebra, Sixth Edition* by Joseph Gallian; a 1" loose-leaf binder; your preferred note-taking materials.

#### OVERVIEW

Abstract Algebra is based on comparing various systems you're not used to, to the number systems you *are* used to – integers, rational numbers, and real numbers. We see which characteristics carry over, which don't, and we try to generalize (*abstract*) information from the results. It arose from the attempt to expand the quadratic formula to higher order polynomials, and has become one of the most important branches of math, with applications both outside and within mathematics. Abstract Algebra has evolved into the study of different broad types of algebraic systems, (groups, rings, and fields, for instance). This introductory course will mainly focus on group theory, concluding with an introduction to ring theory.

In addition to getting an introduction to the beauties of Abstract Algebra, you will gain further insight into what pure mathematics is all about by creating an entire complex structure from a few (relatively) simple definitions.

The goals of this Abstract Algebra course are to introduce you to group and ring theory, provide you with concrete examples of different groups, and give you plenty of opportunities to hone your ability to write both expository mathematics and mathematical proofs. This class will be challenging, and should help you develop mathematically. The abstract nature of the material may intimidate you at first, but I hope you come to find it elegant, absorbing, and even fun.

Plan to spend at least 9-12 hours a week outside of class working on this course. As usual, some weeks you will spend more time on this class than others.

#### CLASS PARTICIPATION

As with any class, you will get more out of it if you actively participate. I am therefore including class participation in your overall grade. This includes asking questions in and out of class, answering questions that I pose, listening respectfully to your classmates, really working with classmates to investigate problems when I ask you to, giving helpful feedback to classmates, and other similar aspects of good academic citizenship. It's usually not an issue in a class of this sort, but be aware that poor attendance or repeated tardiness do count against you.

## ASSIGNMENTS:

- **PROBLEM SETS:** You will (of course) have weekly problem sets, due Wednesdays. You will also have the opportunity to rewrite once any problem you truly tried to do but didn't do to your satisfaction – this should help you improve your proof-writing as well as helping you understand the material. See the attached handout for further details.
- **PORTFOLIO:** Keeping track of the definitions and theorems we cover helps considerably with problem sets and exams. To encourage you in this study technique, I ask you to copy (by hand, or by typing) each definition and each theorem, and to collect these in a binder dedicated to this purpose, which will be collected most Mondays. Please divide the binder into two different sections: *Definitions* and *Theorems*. Since examples and counter-examples are crucial for really understanding what's going on, I will give extra points when you include an example or counter-example beyond what's in the text.

## ADOPTED GROUP PROJECT

One key to really getting a grip on both the basics and on the subtleties of Abstract Algebra is to see it applied to specific examples. To help you with this, you will each adopt a different group this semester, and investigate it thoroughly. During the course of the semester, you will turn in several short papers on your progress, and you will also occasionally give an informal talk on your progress, so that everyone has some familiarity with each group. The culmination of this assignment will be a paper you each will write, explaining all you have learned about your group. See the attached handout for more information on the Adopted Group Writing Assignments, and the syllabus for the various due dates associated with this assignment.

## EXAMS

You will have two open-book, open-note take-home exams during the semester. I will give you four days (Monday to Friday) to work on each exam. See the syllabus for the due dates.

The final will consist of a take-home exam, and possibly also an in-class portion. The take-home portion will be due by 2:30pm on Friday, December 15.

## EVALUATION

I expect to use the weights below, although I reserve the right to change my mind if the semester does not go as expected.

Class Participation	2%
Portfolio	3%
Problem Sets	35%
Adopted Group Project	20%
Two Takehome Exams	24% (12% each)
Comprehensive Takehome Final Exam	16%

## HONOR CODE

I expect you to abide by the Honor Code. *Remember: If you see a violation of the Honor Code occurring, you are bound by the Honor Code to report it.* As part of the honor code, you are required to write *I have abided by the Wheaton College Honor Code in this work*, followed by your signature, on all written assignments. Every time you do, ponder the question "how exactly does the honor code apply to *this* assignment, and did I *really* abide by it?" If, upon consideration, you do not feel you can truthfully write and sign the pledge, please come speak to me immediately! So, specifically, how does the Honor Code apply in this class?

**For all assignments:** You may discuss the work with classmates, and you may use references that help you figure out how to do a problem, but you may not use any references (people, other people's projects or assignments, books, the web) which give you the answer *or* which lead you directly to the solution. When you do use references, you *must* cite them.

**For all group work:** You must make every effort to meet with your group at all meetings. You may not purposely exclude any member from a meeting.

You may not divide the work!  
*Each of you must participate in the solution of each problem.*

You must make every effort to participate and aid in finding the solutions. If you don't understand what someone else is saying, you must ask them to explain it. If someone asks you to explain your ideas, you must take the time to explain it. In the end, you must understand all the work that is being submitted under your name.

When dividing the points, do not give or take credit that is not due.

**Portfolio:** As I mentioned above, you must hand-write or type up the definitions and theorem statements yourself. Scanning, photocopying, or using another person's work is not acceptable.

**Homework:** For the individual problem sets, you must write the results on your own, in your own words. For the group problem sets, after your group has jointly figured out every problem, one person will be responsible for recopying your work. This primary author must change from week to week.

**Adopt-a-Group Project:** As with the homework, you may use references, but you must not plagiarize (copy work, or only re-phrase in a simplistic manner).

**Midterm and Final Exams:** You may use *your* book and *your* notes. If you are sharing a textbook with someone else (which I strongly discourage), please come to my office to discuss how you can share the book in a way which does not corrupt the fairness of the exam. You may *not* borrow anybody's notes during the exam, and of course you may not discuss the exam in any way with anybody but me.