Groups, Rings and Fields
Math 350, Fall 2015

Meeting Time and Location:
Lecture: MWF 9:00am-9:50am, MERR 4
Discussion: Tu 1:00pm-1:50pm, SMUD 207

Professor: Yusra Naqvi
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Prerequisites: MATH 271 or 272, or equivalent Linear Algebra course

Textbook: *Abstract Algebra: A First Course* (2nd Edition) by Dan Saracino, published by Waveland Press (ISBN: 978-1577665366)

Course Webpage: `http://ynaqvi.people.amherst.edu/math350fa15/`

Course topics: This course is an introduction to abstract algebra. We will cover the basic definitions and theorems related to groups, subgroups, group homomorphisms, permutations, rings, ideals, ring homomorphisms, polynomial rings, and quotients. We will also see how these are used ideas are used to solve problems and to write clear and logical proofs.

This course will cover Sections 0-21 from the textbook, although we may omit some details of certain sections. Time permitting, we may also include some additional topics.

Homework: Homework will be assigned after each class and will include both readings and written solutions to problems. Refer to the course website for assignments and their due dates. Written homework must be handed in at the beginning of the class in which they are due, and late homework will not be accepted for grading. Submitted work should be neat, organized, and stapled, and will be graded for both correctness and clarity of writing.

You are required to read the relevant sections from the texbook that we cover each day. It is also important to look at homework problems for each class before the start of the next class in order to keep up with the class effectively. The best way to understand mathematics is to solve a lot of problems!

While you are strongly encouraged to work in groups, all submitted assignments must consist only of your own work, *written in your own words*. If you work with other students or with a tutor, you should include a note at the top of your homework saying who you worked with.

Absences: You are expected to attend every class and arrive on time for class. An absence due to emergency may be excused, provided that you can supply acceptable written evidence if required, and that you notify me *as soon as possible*. Two late arrivals will be treated as an absence. Students with more than four unexcused absences may have their grade lowered by one step (for example, a B- may be lowered to a C+).

Exams: There will be two midterm exams and a three-hour cumulative final exam. All exams must be taken at the scheduled time. Make-up exams will only be allowed if you can supply *acceptable* written evidence, and that you notify me *before the end of the missed exam.* The midterm exams are tentatively scheduled as follows:

Midterm Exam 1:   Friday, October 9
Midterm Exam 2:   Monday, November 9

The final exam will be scheduled by the registrar at some point during the semester.

Grading: Your overall grade will be determined using the following point distribution:

Homework	125
1st Midterm Exam	100
2nd Midterm Exam	100
Final Exam	175
Total	500

However, students who do not submit at least 6 homework assignments (on time) will automatically get an F, regardless of numerical averages.

About the Statement of Intellectual Responsibilty: While you are strongly encouraged to work on homework problems in groups, the work you write up and hand in must be your own. If you receive help from an outside source, please include a note in your homework specifying what this was. For exams, you are not permitted to work with other students or use any additional aids such as calculators, notes, formula sheets, etc. If you are unsure about whether something is allowed or not, please speak with me, and I would be happy to clarify.

Failure to comply with the above guidelines on homework or a midterm will result in a 0 for the assignment. Cheating on the final exam will result in an F for the course. All incidences will be reported to your class dean.

Course Outline: The following plan for the course is tentative and may be subject to change.

Week	Dates	Sections	Topics
1	9/8-9/11	1	Binary Operations
		2	Groups
		3	Basic Theorems about Groups
2	9/14-9/18	4	Cyclic Groups
		5	Subgroups
		6	Direct Products
3	9/21-9/25	7	Functions
		8	The Symmetric Group
4	9/28-10/2	9	Cosets
		10	Lagrange's Theorem
5	10/5-10/7	11	Normal Subgroups
5	F 10/9		**MIDTERM EXAM #1**
6	10/14-10/16	12	Homomorphisms
		13	Homomorphism Theorems
7	10/19-10/23	14	Finite Groups
		15	Sylow Theorems
8	10/26-10/30	16	Rings
		17	Ideals
9	11/2-11/6	18	Ring Homomorphisms
10	M 11/9		**MIDTERM EXAM #2**
10	11/10-11/13	19	Polynomials
11	11/16-11/20	20	Ideals of Polynomial Rings
12	11/30-12/4	21	Unique Factorization Domains
13	12/7-12/11		Additional Algebraic Structures
14	12/14		Review for Final Exam