

Math 113 - Abstract Algebra, Summer 2018

Instructor: Ritvik Ramkumar

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Website: <https://math.berkeley.edu/~ritvik/math113>

Lectures: Cory 289, MTWTh, 4pm - 6pm

Office hours: 1062 Evans Hall, Wednesday, Thursday, 3pm - 4pm

Required Text: Fraleigh, John B. "A First Course In Abstract Algebra", 7th. edition

Prerequisite: Math 54 or a course with equivalent linear algebra content

Course description*: Math 113 is an introduction to groups, rings, and fields. These are fundamental algebraic structures, which you can think of as generalized number systems. They abstract the operations of addition and multiplication present in number systems such as the integers, the real numbers, the complex numbers, etc. and allow us to make precise analogies between the algebra of these systems and others: polynomials, rational functions, matrices, permutations, symmetries in geometry, etc.

The study of groups, rings, and fields originated in the problem of the (un)solvability of equations by radicals, which was famously resolved by Évariste Galois in the early 19th century. Although we will not have time to study Galois theory in detail, my goal will be to develop enough building blocks to sketch a proof of the unsolvability of quintic equations at the end of the course.

An equally important goal of Math 113 is to develop your skills at creating and communicating mathematical arguments. This is probably among the first courses you have taken in which the majority of time - in lecture and on the homework - will be spent proving things. We will talk about proof strategies and style in class, but the most important thing to remember is that proofs are written to be read: clarity and precise use of language are just as important as logical correctness.

For a list of topics, refer to the course website.

Grading Policy: There will be weekly homework (due Thursdays), one midterm and a final exam. Since the course moves extremely quickly, late homework will not be accepted and there will be **NO** makeup exams. The percentage breakdown is as follows:

- Homework: 20%
 - Midterm: 40% [**Tuesday, July 17**]
 - Final Exam: 40% [**Thursday, August 9**]
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Disability policy: Students requiring special examination arrangements, note takers, or other accommodations should please consult the Disabled Students Program (DSP) office and notify their instructor promptly at the beginning of the semester. For more information, please refer to <http://dsp.berkeley.edu>.

Plagiarism/cheating policy: Dishonesty such as cheating or plagiarism is strictly prohibited and may lead to appropriate disciplinary action.

* Borrowed from A. Kruckman