

Instructor Amites Sarkar

Text A First Course in Abstract Algebra (7th ed.)
John B. Fraleigh

Syllabus

Parts I, II and III of the book.

Overview

This course is an introduction to **group theory**. The concept of a group is one of the great unifying ideas in mathematics. It arises in number theory, in the theory of polynomial equations, and in geometry. Group theory is really just the study of **symmetry**. It may not be obvious how to talk about the symmetry of an equation in any meaningful way, but this is essentially what Galois did in 1830 and mathematics has never looked back. Physicists use group theory to study the symmetries of physical laws (e.g. Maxwell's equations), and chemists use group theory to study the symmetries of crystals and molecules. Groups can be finite or infinite, and we shall see examples of both types.

The level of abstraction for this course is higher than for any course you have already taken. The "abstract vector spaces" part of our Linear Algebra course (Math 204) is probably closest in spirit. But I will include plenty of examples so don't worry.

Relation to overall program goals

Among other things, this course will (i) enhance your problem-solving skills; (ii) help you recognize that a problem can have different useful representations (graphical, numerical, or symbolic); (iii) increase your appreciation of the role of mathematics in the sciences and the real world.

Exams

Midterm 1 Friday 30 January
Midterm 2 Friday 27 February
Final Wednesday 18 March 8–10 am

Grading

The midterms are each worth 25%, and the final is worth 50%. If you feel too ill to take an exam, don't take it, but bring a doctor's certificate to me when you feel better and I will make arrangements.

Office hours

My office hours are 3–4 on Mondays, Tuesdays, Thursdays and Fridays, in 216 Bond Hall.
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