

Math 521B, Abstract Algebra

Spring 2008, 5:35–6:50 MW, C-8

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Office hours: 3:35–4:35 MW, 5–6 Tu.

Prerequisites: Math 521A (Abstract Algebra) or equivalent. If you earned less than a C in Math 521A, you are likely to find that this course is not appropriate for you.

Required text: Gallian: Contemporary Abstract Algebra.

Course objective: This is the second semester of a year-long course on abstract algebra. We will cover some group homomorphisms, isomorphisms, cosets, quotient groups, and the isomorphism theorems. We will also cover rings, ideals, ring homomorphisms, isomorphisms, and the isomorphism theorems. We will learn about fields, quotient fields, and field extensions. The course is intended for advanced undergraduate mathematics majors who have already taken a semester of algebra and are familiar with the basic notions of groups. We will treat the material rigorously, which means that we will do many proofs. You will be expected to understand and be able to reproduce these proofs, as well as to apply the concepts and techniques covered to solve familiar and unfamiliar problems in algebra whose level and sophistication are comparable to the material in lecture and on the homework. The course will be fast-paced and you will be expected to do a fair amount of work outside of class.

Website: www.rohan.sdsu.edu/~ituba/math521b. I will also use Blackboard to post your exam grades periodically.

Class attendance This is not distance education. You are expected to attend and participate in classes. I will assume that you are an adult and are here to learn. I will not be policing your attendance. If you keep skipping classes, you will find me unsympathetic to your cause.

Homework and reading will be posted on the class website regularly. You will be able to follow the progress of the course using the website. HW is an essential part of your learning. Take it very seriously. It is extremely important that you keep up with the HW. If you do not, you will quickly find yourself lost in class and at a great disadvantage during exams. Treat the HW as a learning opportunity, rather than something you need to get out of the way. Reread, revise, and polish your solutions until they are correct, concise, efficient, and elegant. This will really deepen your understanding of the material. You are unlikely to succeed in a math class without doing all of the HW. Attending class and reading your textbook are necessary but not sufficient conditions for passing the course. Expecting to learn math without doing exercises on your own is like expecting to learn to drive a car without ever sitting behind the steering wheel.

HW will not be collected. You will instead keep a notebook with all your HW solutions *separate from your lecture notes*—I recommend a 3-ring binder. You will be allowed to use your notebook during the first half of every exam, but not your lecture notes. If you do not keep your HW separate from your lecture notes, you will not be allowed to look at it during the exams.

That HW is not collected is not an indication that it is optional. Rather it is meant to instill in you independence and personal responsibility. You do not do the HW in order to turn it in and have it graded. You do it so you learn the material. I strongly encourage you to seek feedback on your work. You can discuss it with me during office hours or submit it to me so I can correct it and comment on it.

This gives you an obvious winning strategy. Do the HW, seek feedback on it, revise it, and keep

your HW notes neat and organized. If your HW solutions are correct, all you have to do is copy them during the first half of the exams. This will guarantee you half the score and will permit you to move quickly on to the second half of the exam. The extra time and the experience you gain by keeping up with your HW will be invaluable on doing well on the second half of the exams. On the other hand, if you do not keep up with your HW, you will face the challenge of solving many unfamiliar problems under time pressure during the exams. You will likely find this an impossibly daunting task.

Collaboration on the HW: Limited collaboration with your fellow students in the class is OK. The idea is to let you discuss and critique each other's ideas and not to let you split the workload. Keep collaboration constructive and reasonable. You are expected to fully understand the solution and write it up on your own. Your understanding of the material will be tested on the exams.

If you are approached by another student from the class who wants to copy your HW notes—this may happen just before an exam—keep in the mind that the class is curved. By sharing your work with your friend, you are likely raising the curve which determines your grade.

Discussion sections: I strongly encourage you to organize a weekly session to work with your fellow students on problems in class and on the homework. This will help you keep up with your work and get ideas and feedback from others who are grappling with the same exercises as you. You may find that the sense of companionship motivates and encourages you to work.

Exams: There will be three in-class exams as well as a final exam. Your two highest scores on the in-class exams and your score on the final will be used to determine your grade. The in-class exams will be on Feb 25, Mar 19, Apr 21. If you skip an exam, it will become the dropped exam. You will normally not be able to make it up, unless you have a compelling (e.g. medical) and documented excuse. Forgetting that there is an exam or being unprepared for it are not considered compelling excuses.

Final exam: Time and place TBA.

Problem of the fortnight: The Mathematics Department in San Diego posts an interesting problem every two weeks. I will give you extra credit for every problem to which you submit a correct solution to the organizers of the contest. You can also win a t-shirt and if your solution is deemed the best, a book. You will find a link to these problems on the class website.

Grading scheme:

In-class exams (two highest scores)	30% each
Final exam	40%
Problem of the fortnight	1% each

A score of 80% or more will guarantee an A, 60% a B, 40% a C, and 20% a D. The curve may be adjusted somewhat lower than this.

Quality of work: It is important that you work neatly on the assignments. The quality of your work will affect your grades on the exams. Quality has to do with how easy it is for someone else to read your solution to a problem. It is not enough to do the math right, you must also communicate it well.

Students with disabilities: If you need special arrangements, let me know well in advance so we can plan to accommodate your needs.

On independent work: Learning math is much like learning to ride a bicycle in that you learn by doing it and not by watching someone else do it. Attending class and reading the textbook won't be enough to do well on the exams. You should work through every example and proof in the book and in your class notes and expect to have to re-read everything several times. It's slow, but then your reading list for this class is short.