Math 5285H: Fundamental Structures of Algebra I

Course Syllabus

Instructor: Gregg Musiker, Office in Vincent Hall 251
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Meeting time: This class will meet on MWF 10:10-11:00 in Vincent Hall 213.

Office hours: TBD. MWF 11:00-12:05 pm or by appointment for the first week.

Course Webpage: http://www.math.umn.edu/~musiker/5286H/

Course Content: This is the first semester of a course in the basic algebra of groups, ring, fields, and vector spaces. Roughly speaking, the Fall and Spring semesters should divide the topics as follows:

Fall) Vector spaces, linear algebra, group theory, symmetry, and the Sylow Theorems
Spring) Rings, fields, modules, and Galois theory

Prerequisites: Some previous exposure to linear algebra (vectors, matrices, determinants) (such as from 2243, 2373, or 2573) would help. Also, one should either have the ability to write and read mathematical proofs (such as from 2283, 2574, or 3283), or have the desire and drive to learn how.


Fall: some (but not all) of Chapters 1-7;
Spring: some (but not all) of Chapters 11-16

Note that I will be following the brand new second edition in this course, and encourage you to do the same. If you have the first edition, your text will more or less contain the same topics (although with occasional exceptions and sometimes in a different order), but the references to section numbers and exercises will not match the ones I announce in class and on the website. If you are in this situation, please find a classmate with the new edition or come talk to me early on.

Other useful texts (on reserve in the math library): For certain course topics, you may benefit from seeing alternative treatments, as available in other textbooks. Some of these include Nicholson’s Introduction to abstract algebra, Gallian’s Contemporary abstract algebra, Hungerford’s Algebra, Dummit
and Foote’s *Abstract algebra*, or Judson’s *Abstract algebra: theory and applications* (also available online at [http://abstract.ups.edu](http://abstract.ups.edu)).

**Homework (50%)**: There will be 5 homework assignments due approximately every other week (tentatively) on Wednesdays in class. The first homework assignment is due on February 3rd.

I encourage collaboration on the homework, as long as each person understands the solutions, writes them up in their own words, and indicates their collaborators. Late homework will not be accepted. Early homework is fine, and can be left in my mailbox in the School of Math mailroom in Vincent Hall 107. Homework solutions should be well-explained; the grader is told not to give credit for an unsupported answer. Complaints about the grading should be brought to me.

**Exams (15% each)**: There will be 2 take-home exams, handed out on February 17th (due February 24th) and March 30th (due April 6th). Each will be open book, open notes, and with calculators allowed. However, for these exams, you are not allowed to consult other electronic sources, such as the internet, and you are not allowed to collaborate or consult with other students or other human sources. These exams are to be collected in class.

**Final Exam (20%)**: The final exam will be take-home as well, under the same policies as above, handed out on April 27th, to be turned in during class on May 4th.

**Class Participation**: Participation in class is encouraged. Please feel free to stop me and ask questions during lecture. Otherwise, I might stop and ask you questions instead.

**University Policy Statements**: The University Senate statements regarding academic dishonesty, credit, and workload expectations, and grading standards are at

[http://policy.umn.edu/Policies/Education/Education/GRADINGTRANSCRIPTS.html](http://policy.umn.edu/Policies/Education/Education/GRADINGTRANSCRIPTS.html) and [http://policy.umn.edu/Policies/Education/Education/STUDENTWORK.html](http://policy.umn.edu/Policies/Education/Education/STUDENTWORK.html).

**Scholastic Misconduct**: You must do your own work on all portions of the exams. Academic dishonesty in any portion of the academic work for this course will be grounds for awarding a grade of “F” for the entire course.

**Important Due Dates**:

| HW 1       | February 3 |
| HW 2       | February 17 |
| Take-Home Exam 1 | February 24 |
| HW 3       | March 9 |
| HW 4       | March 30 |
| Take-Home Exam 2 | April 6 |
| HW 5       | April 27 |
| Final Exam | May 4 |