

# MST 321 - Modern Algebra I

## Course Syllabus

### Course Location

MWF 2:00-2:50 pm, Manchester Hall 122

### Contact information

Name: Jeremy Rouse

E-mail: [rouseja@wfu.edu](mailto:rouseja@wfu.edu)

Office: Room 128, Manchester Hall.

Office Phone: (336) 758-4159.

Office Hours: Mondays 5:00-6:00 pm and Thursdays, 4:00-5:00 pm.

### Course Information

This modern algebra I course is a course in the theory of groups. These mathematical objects are very general, abstract, and may be quite unfamiliar to you at first. However, they arise throughout mathematics, and in the late 19th century mathematicians realized that many different areas would benefit from isolating and studying these objects. One fundamental notion we will discuss during the semester is that of *isomorphism* between two groups. Two isomorphic groups might look different, but they are fundamentally the same. This course will further refine your proof-writing skills and your ability to think abstractly.

**Website:** <http://users.wfu.edu/rouseja/S2020/321>

**Class diary:** <http://users.wfu.edu/rouseja/S2020/321/diary.html> - This part of the site will have a summary of what happened in class, assigned reading for the next class meeting, as well as assigned work.

**Textbook:** Joseph A. Gallian's *Contemporary Abstract Algebra*, 8th edition. The ISBN is 978-81-315-2074-1. We will cover approximately chapters 0-10 of this book.

### Assignments

Homework problems will be assigned after most class meetings and posted on the class diary. All the problems assigned during one week will be due on the Friday of the following week at the start of class. To stay up on the material, I *strongly* encourage you to do the homework problems as they are assigned. There may be instances where the exams will cover material before the homework problems on that material are due.

To write a proper mathematical proof, you must know for sure the precise meaning of all of the mathematical terms that you use. For this reason, each student should maintain a list of all definitions given throughout the course. The terms which should be on your list of definitions will be posted on the class diary (after the class meeting in which they are introduced). [ One fifth of each exam will be devoted to testing definitions. ]

Another key tool in writing proofs is knowing the theorems which can be used. For this reason, I'd like to ask you to keep a separate list of the theorems which we have stated and proven (either from the book or in class). [ You may not use your theorem list on midterm exams, but you may bring it and refer to it on the final exam. ]

Graduate students are allowed to enroll in the cross-listed MST 682. There will be homework problems that are extra-credit for undergraduate students but are required for graduate students. Graduate students will have more difficult exams than undergraduate students.

### Tests and grades

There will be two midterm exams. Each will have an in-class component and a take-home component. The dates for the exams will be Friday, February 14 (with the take-home component due on Monday, February 17), and Friday, March 27 (with the take-home component due on Monday, March 30). The final exam will be an in-class exam from 2-5 on Friday, May 1. On take-home exams, the use of course materials (notes and the textbook) are allowed, but no other materials are allowed.

Homework is worth 20 percent of your grade, each midterm is worth 22.5 percent of your grade, and the final is worth 30 percent of your grade. The remaining 5 percent of your grade will be determined by the successful compilation of your definition and theorem lists.

The following table indicates the level of achievement (specified by the Bulletin) needed for various letter grades. Also, I give a percentage which is sufficient to receive that grade. (I do not claim these percentages are necessary. That will be decided at the end of the course.)

Grade(s)	Level of achievement	Percentage
A	Exceptionally high achievement	93 $\frac{1}{3}$ %
A-, B+, B	Superior	83 $\frac{1}{3}$ %
B-, C+, C	Satisfactory	73 $\frac{1}{3}$ %
C-, D+, D, D-	Passing but unsatisfactory	60 %

### Resources for help

- Read the textbook. I will post the sections that you should read before the next class meeting.
- Attend class. You will hopefully learn a lot from the lectures, and discussions.
- Do the assigned problems, preferably every day after they are assigned.
- Work with fellow students on the homework. Some of the problems will likely be fairly challenging.
- Come to office hours if you have questions about the course material, homework, or any of the general ideas we discuss.
- There may be MST 321 specific study sessions held by math graduate students. (Fingers crossed!)

- The Math Center is located in Kirby Hall and offers one-on-one tutoring to Wake Forest students. You can make an appointment, or drop-in. See <http://mathandstatscenter.wfu.edu> for details.
- Modern algebra has a reputation for being a quite difficult course. If you are having trouble, I would encourage you to seek out whatever resources will help you learn the material in the way that is most helpful to you.

### **Disabilities**

Wake Forest University provides reasonable accommodations to students with disabilities. If you are in need of an accommodation, you are encouraged to contact me privately as early in the term as possible. Retroactive accommodations will not be provided. Students requiring accommodations must also consult the Learning Assistance Center & Disability Services (118 Reynolda Hall, 336-758-5929, <http://lac.wfu.edu>).

### **General comments**

I am excited to share the course material with you. (When I was in graduate school, I thought seriously about becoming a group theorist and devoting my mathematical life to studying the objects of this course.) I wish to teach you in the best way possible, and this requires your input. Please let me know what I can do or change to aid your learning.

I pledge to do my best as your instructor, and in return I expect each of you to be actively involved in this course by participating in class, and by taking the time necessary outside of class to come to terms with the material.