Instructor: Prof. M. Sandoval, Nutt MECC 245, 297-2062, email: mary.sandoval@trincoll.edu. (Email is the best way to reach me outside of office hours.)

Time and Location: MWF 10:00 - 10:50, McCook 102.

Course Website: We have a Moodle Website in the usual place. You can find assignments, learning goals, proof rubrics, and other course documents there, as well as class handouts.

Tentative Office Hours (held in MCEC 245) (See course website for up-to-date schedule of Office Hours):
- Monday 12:00-1:00pm
- Tuesday 10:00am–noon
- Wednesday 3:00-4:00pm or by appointment.
- Thursday none
- Friday 12:00–1pm

About this course: This course is about an abstract algebraic structure known as group theory which is one of the principal areas of theoretical mathematics that underlies everything from the structure of art, music and dance to the fundamental laws of physics. It is certainly one of the most versatile areas of mathematics. Our focus in this course will be the structure of finite groups, although we will also look at infinite groups from time to time.

By the end of this course a successful student will be able to

1. Construct and write a wide variety of different types of mathematical arguments (proofs) in the context of abstract algebra;

2. Understand and be able to prove things about the structure of the integers, especially using induction;

3. Become familiar with groups as an algebraic structure;

4. Understand the role that groups play in understanding abstract symmetries;

5. Be able to classify groups of finite orders;

6. Be able to determine when two groups have the same structure and understand and be able to use the idea of an isomorphism between groups

7. Be able to break down a finite group via quotients to understand the internal structure of those groups.

Textbook: Abstract Algebra, Third Edition, by I. N. Herstein. This book is small and dense. Please remember that reading mathematics is not like reading a novel. To really understand written mathematics, you really have to engage in active reading, not just skimming for the gist of things. Active reading means reading and then thinking about each point made in the text. (This is a very useful skill to acquire in any technical field.) To be really successful in this course, you will need to actively read the sections of the text as we go along.

Material: Chapters 1 through 3, most sections, plus some additional topics on Cayley Graphs.
Grading: The course grade will be based on the following distribution:

Weekly Problem Sets and possibly Quizzes due on Wednesdays 50 percent
Midterm Wednesday, March 6th 20 percent
Final Monday, May 6th, at 9am in McCook 102 30 percent

Problem Sets: Problem Sets will usually consist of 5-10 problems. All assignments must be turned in. Assignments are due at the beginning of class on Wednesdays. This class is writing intensive and requires that you incorporate feedback on your work to improve your future proof-writing. In order to give you feedback in a timely manner, I need to grade the homeworks in a timely manner. Because of this late homework will generally not be accepted, as it really slows down the grading process for everyone.

Office Hours: This course is hard, however, to help you I have many office hours (see above). The purpose of office hours is for you to learn effective strategies to figure out how to help yourself. I won’t do any of the problems for you, but I will help guide you to learn how to find the pieces and put them together for yourself, emphasizing the strategies that you need to use along the way. This can sometimes be an extended conversation over several days. You should keep this in mind and make sure to leave yourself adequate time to figure things out. To be successful, you should avoid working on problem sets at the last minute, after the last office hour has passed.

The Final: The final exam has a take-home portion and an in-class portion. The in-class portion is on Monday, May 6th, at 9am here in McCook 102. Make your travel plans accordingly. For logistical reasons, the final cannot be rescheduled for students who make conflicting travel plans. The instructor reserves the right to reschedule the exam at the start of the following semester for those who violate this rule. In the interim, the student receives a NO GRADE which reverts to an F until the exam is made up.

Athletes and Scheduling Difficulties: Athletes and others who have scheduled absences are responsible for notifying me in advance of any scheduling conflicts with deadlines, or exams. In addition, if there are sudden changes in your schedule, due to playoffs or rain-outs, you are responsible for notifying me in advance as well.

Absences: If you are absent, remember to do the following:

- To get any handouts or assignment sheets you have missed.
- To get a copy of the class notes from one of your classmates.
- To learn the material that you have missed. (I am, of course, available in office hours to assist you, but you will find that it is impossible to recreate the experience a missed class. I can fill in details after you have made a careful study of both the text and the class notes.)
- To know and keep the same deadlines as everyone else.
- To collect any graded work that has been handed back during the missed class.

Academic Honesty: Academic honesty is highly valued at Trinity. The College policies on intellectual honesty are found in the Student Handbook, in addition to which I may add specific instructions for specific assignments, which I will give to you in writing. If in any doubt, do not fail to contact me by phone or email to clarify any question before an assignment is submitted. In general, it is always wise to avoid even the appearance of academic dishonesty. Unhappily, cases of academic dishonesty are all too common and are vigorously prosecuted. Suspensions and expulsions are often the result.