

Professor: Dr. Chris Black
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Required Text: *An Introduction to Abstract Algebra with Notes to the Future Teacher*, Nicodemi, Sutherland & Towsley, Prentice Hall, 2007

Supplementary Text: *A First Course in Abstract Algebra*, 7th edition, John B. Fraleigh

GOALS FOR COURSE:

MATH 361 students will:

- ... improve their ability to think abstractly and critically;
 - ... be able to communicate in precise written mathematical language, using correct logic and notation;
 - ... be able to identify groups with certain properties, and provide concrete examples;
 - ... have a firm grasp on the basic concepts of group theory, and the facility to apply them to particular groups;
 - ... actively participate in the classroom dialogue, both as an individual and as a member of a small group, and be an active partner during in-class exercises.
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COURSE PHILOSOPHY:

In this course, we will continue our study of advanced algebra, focusing on the study of group theory. We will consider the connections between group theory and transformational geometry, with particular attention to concepts that appear in the high school curriculum. Abstract algebra is a dynamic, active field – many of my mathematical colleagues are engaged in research in the areas of group theory, ring theory, and matroid theory. Concepts and methodologies from algebra are used in diverse fields such as computer science, physics, and chemistry, as well as mathematics.

There are two types of problems in this course: computational problems (which may still be fairly abstract), and proofs; as stated in the course goals, we will continue to develop proof-writing ability. In this course, however, proofs can be tricky since there is rarely a picture you can draw to get yourself started. We will see that many of the methods and topics studied in Math 260 are used in extensively in this course.

COURSE TOPICS:

- ▷ Groups and Subgroups: general groups, cyclic groups, generating sets
- ▷ Permutation Groups
- ▷ Isomorphism & Homomorphism
- ▷ Direct Products & Classification of Finite Abelian Groups
- ▷ Symmetry Groups

GRADING:

Homework:	300 - 350 points, as needed
Take-Home Exams:	200 points (2 @ 100 pts each)
Final Exam:	100 points
Participation:	15 points
Attendance & Citizenship:	15 points

HOMEWORK:

There are two types of homework problems in this course: computational problems and proofs. All assigned problems will be collected, though not all will be graded. In addition to the point total for the graded problems, one point per non-graded problem will be awarded for completeness of the assignment for each section of material. Some of the collected problems will be proofs, and often the problems I have chosen to collect present an important part of the theory of the course. Proofs will be graded out of 10 points according to the *Proof Writing Guidelines*. Computational problems will have varying point values.

If necessary, graded problems may be re-written and re-submitted within one week of your receipt of the graded assignment, but the points for completeness cannot be made up through rewriting the assignment. Solutions to non-graded problems will be posted on blackboard *after* the assignment is collected the first time. Assignments may be accepted up to one week late; late assignments will forfeit both the completeness points and the right to a rewrite.

You may work in groups to discuss the homework problems, however the final version should be written individually. **It is considered plagiarism to find solutions to proofs assigned as homework in other texts or on the internet.** You are invited to come see me for hints on homework problems if you get stuck.

PARTICIPATION:

We will spend a portion of each class session working in small groups, and I will often ask students to present their work to the class. Your participation will be graded based on your interactions with your peers, your attentiveness and on-task behavior during class and how often you volunteer to present your solutions.

CITIZENSHIP:

Discussion, interaction, and group problem solving will all be important aspects of this course, which necessitate your attendance. Citizenship addresses your behavior and comportsment with class members and the professor. We each need to be respectful of other students, other cultures, and differing ideas within our learning community.

HONOR AND RESPECT:

Each of us should consider our placement at this institution to be a privilege. We need to have respect for one another, and for ourselves. In light of these facts, cheating in any form will not be tolerated. You are encouraged to work together on homework problems, however anything you turn in with your name on it should have been written by you alone. In a course where much of your grade is determined by your proof writing and take-home exams, plagiarism is a concern. The word “plagiarize” is defined by Merriam-Webster as “to steal and pass off (the ideas or words of another) as one’s own: use (another’s production) without crediting the source.” This is a very serious offense.

DISABILITY SERVICES:

Students with disabilities may arrange for academic adjustments by providing the professor with a copy of the “Confirmation of Eligibility for Academic Adjustments” from the Disability Support Services Office as soon as possible. To obtain this form, contact the Disability Support Services Office at the main campus at dssrecept@cwu.edu or (509) 963-2171.