Course Description
A first course in the modern algebraic structures and techniques fundamental to mathematics and useful in many areas of science and engineering. Topics include: groups, subgroups, quotient groups, group homomorphisms, isomorphism theorems, permutation groups, finite groups, matrix groups, and applications to combinatorics, geometry, and symmetry.

Prerequisite
MATH 232 (Linear Algebra). MATH 220 (Discrete Mathematics) is strongly recommended.

Textbook (required, open source)

Grading
Grades will be given based on the following scale and your overall percentage in the course.

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<th>Letter</th>
<th>A</th>
<th>A-</th>
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<th>B-</th>
<th>C+</th>
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<th>D</th>
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<td>[80, 83)</td>
<td>[77, 80)</td>
<td>[73, 77)</td>
<td>[70, 73)</td>
<td>[60, 70)</td>
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QFR (Quantitative and Formal Reasoning) credit and Pass/No Entry: to earn QFR credit one must pass the course. If the course is taken for a grade, then ≥D is considered passing. If the course is taken Pass/No Entry, then ≥C- is considered passing and is given the grade Pass (P); work <C- is considered not passing and is given the grade No Entry (NE).

50% Homework
Homework will be assigned weekly on Blackboard and typically will be due on Friday. Homework must be written up neatly with your full name on the top of the first page, with multiple pages scanned as a single pdf document, and uploaded to Blackboard. Students are encouraged to work together to learn the material, but each student must independently write up their own solutions. Homework is a major part of the course. The lowest score is dropped. No late homework will be accepted.

25% Midterm Exam
Wednesday, March 17 in class. No electronic devices, notes, or books are allowed on exams.

25% Final Exam
Monday, May 10, 9–11 a.m. No electronic devices, notes, or books are allowed on exams.
Disabilities
The college will make reasonable accommodations for persons with documented disabilities. Students should notify the Office of Disability Services located in Peters G-27/G-28 and their instructor of any disability related needs within the first two weeks of class.

Honor Code
The College requires that students sign an Honor Code for all assignments. This pledge (which is written out on each assignment) states: “I affirm that I have adhered to the Honor Code in this assignment.” For further information, see: https://www.oberlin.edu/dean-of-students/student-conduct/academic-integrity.

Cell Phones
The use of cell phones, smart phones, and other mobile communication devices is disruptive and is therefore prohibited during class. Except in emergencies, those using such devices are kindly asked to leave the classroom.

Important Dates

- First day of classes: Monday, February 1.
- First week of classes remote: February 1–5.
- Add/drop deadline: Wednesday, February 10.
- Midterm Exam: Wednesday, March 17 in class.
- No classes: Monday, March 22 – Tuesday, March 23.
- Midterm grades available via Banner: Friday, March 26.
- Last day of classes: Tuesday, May 4.
- Last day to declare P/NE: Saturday, May 8.
- Final Exam: Monday, May 10, 9–11 a.m.

Learning Goals
By the end of this course, students will be able to:

- Understand the concept of a group and where they arise naturally.
- List several important examples of groups.
- Understand the mappings of groups (homomorphisms) and their importance.
- Understand the importance of normal subgroups.
- Identify certain isomorphic groups and distinguish certain nonisomorphic groups.
- Classify finitely generated abelian groups.
- Use groups to solve certain problems involving counting, geometry, and symmetry.