

# COURSE LEARNING OUTCOMES

DEPARTMENT: Mathematics

<p><b>COURSE #: 34700</b>  <b>COURSE TITLE: Elements of Modern Algebra</b>                  Term offered: Spring only                  PRE-REQUISITES: Grades of C or higher in MATH 30800 and MATH 34600 or placement by the Department. Partial credit may be given for MATH 44900 after completion of MATH 34700. Recommended for prospective teachers and others who want a basic course in abstract algebra.                  CO-REQUISITES: None                  HOURS/CREDITS: 4 hrs./ week; 4 credits.                  DATE EFFECTIVE: 1/7/21                  COURSE COORDINATOR: Brooke Feigon</p>	<p><b>CATALOG DESCRIPTION</b>                  Sets, mappings, rings, isomorphisms, integral domains, properties of integers, fields, rational numbers, complex numbers, polynomials, groups.</p> <p><b>Suggested Text:</b> <i>Abstract Algebra, Theory and Applications</i> by Thomas W. Judson</p>
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## COURSE LEARNING OUTCOMES

Please describe below all learning outcomes of the course, and indicate the letter(s) of the corresponding Departmental Learning Outcome(s) (see list at bottom) in the column at right.

After taking this course, the student should be able to:	Contributes to Departmental Learning Outcome(s):
1. Write clear and rigorous proofs or disproofs of mathematical statements utilizing basic proof techniques.	e1,e2,f,g
2. Learn basic definitions of groups, rings and fields.	e1,e2
3. Understand the notions of homomorphisms, isomorphisms, cosets, quotients and group actions.	e1,e2
4. State and prove basic theorems in group theory, including the Isomorphism Theorems, Lagrange's theorem and orbit-stabilizer theorem.	e1,e2,f,g
5. State and prove Isomorphism Theorems in ring theory.	e1,e2,f,g
6. State, prove and use irreducibility criteria for integer and rational polynomials.	a,e1,e2,f,g
7. Understand concept of a vector space over a general field.	e1,e2

## COURSE ASSESSMENT TOOLS

Please describe below all assessment tools that are used in the course.

You may also indicate the percentage that each assessment contributes to the final grade.

1. Final exam: 40%
2. In-class exams, quizzes, homework, attendance: 60%

## DEPARTMENTAL LEARNING OUTCOMES (to be filled out by departmental mentor)

**The mathematics department, in its varied courses, aims to teach students to**

- a. perform numeric and symbolic computations
- b. construct and apply symbolic and graphical representations of functions
- c. model real-life problems mathematically
- d. use technology appropriately to analyze mathematical problems
- e. state (e1) and apply (e2) mathematical definitions and theorems
- f. prove fundamental theorems
- g. construct and present (generally in writing, but, occasionally, orally) a rigorous mathematical argument.