Syllabus: MA 632–2B — Abstract Algebra
Spring 2026

Class meets: Tuesday & Thursday 9:30–10:45, UH 4002
Instructor: Dr. Nándor Simányi
Office: UH 4014, phone: 934-2154, E-mail: simanyi@uab.edu
Dedicated class web page:
https://uab.box.com/s/osc1c6wjbqx5hbppvp0plhvnyn8ekuhd
Office hours: Tuesdays and Thursdays, 11:00–12:00, or by appointment.

Course Description. The Most Important Algebraic Structures: Groups, Rings, Fields, Order

Textbook. I. N. Herstein: Abstract Algebra. John Wiley & Sons.

Homework will be assigned on a weekly basis.

Prerequisite. Admission to the graduate program, or by my permission.

Assessment Procedures. Student achievement will be assessed by any or all of several measures: Regularly assigned homework problems, two midterm tests, and a comprehensive final exam. A numerical score is given on each of them.

Class Attendance: Class attendance is mandatory. One can get a passing grade only if the number of their unexcused absences is not more than 20% of the number of classes!

Grading Policy. Student achievement on the items assessed will be used to determine the final grade. The percentage of the final numerical grade assigned to each item is as follows: final exam: 40%; two midterm tests: 20% each; homework 20%. At the end I will "reasonably" curve the overall numerical scores.

Final exam. Thursday, April 30, 8:00–10:30

Draft Syllabus

Groups.

Semigroups and groups: Definitions and examples
Subgroups, isomorphisms
Transformation groups
Cyclic groups, order of an element
Coset decomposition, Lagrange's theorem

Homomorphisms. Normal subgroups and factor groups
The homomorphism theorems
Cauchy's theorem
The center of a group. Conjugate classes
Direct products
Finite Abelian groups
The symmetric group: Cycle decomposition, even & odd permutations

Ring Theory.

Definitions and examples
Subring, center
Ideals, homomorphisms, quotient rings
Maximal ideals
Polynomial rings and their structure
Number of roots of a polynomial
Polynomials over the rationals
The quotient field of an integral domain

Elements of Theory of Fields.

Fields, prime fields, characteristics
Field extensions
Elements of Galois Theory