

COURSE DESCRIPTION
ABSTRACT ALGEBRA
MA 632-2B
SPRING 2021

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Professor Nikita Selinger
Office: UH 4016
Phone#: (205) 934-2154
E-mail: selinger@uab.edu
Office Hours: Before/after class, drop-in, or email for appointment.

Meeting times: TuTh, 9:30 – 10:45 AM
Textbook: *I. N. Herstein: Abstract Algebra. John Wiley & Sons.* Third Edition.

Important dates:

First day of classes: Tuesday, January 19, 2021.
Last day to drop/add: Friday, January 26, 2021.
Wellness day: Tuesday, March 16, 2021.
Wellness day: Wednesday, April 14, 2021.
Last day of classes: Wednesday, April 23, 2021.
Final exam: 8.00-10.30 AM Thursday, April 29, 2021.

Syllabus

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, 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

Course policies:

- Please make sure that you are able to receive e-mail through your Blazer-ID account. Official course announcements may be sent to that address.
- If you are contacted by the Early Alert Program, you should consider taking advantage of the services it offers. Various services to assist you are also listed in the *Student Resources* section of the *Blazernet* web site.
- If you wish to request a disability accommodation please contact DSS at 934-4205 or at *dss@uab.edu*.
- If a test is missed due to a serious verifiable circumstance or official university business, the test grade will be replaced with the properly rescaled final exam score. If you miss the final exam you will receive a zero score for this exam. In all cases you **must** contact your instructor of such circumstances **before** the exam takes place.

Methods of teaching and learning:

- Class meetings of 75 minutes consisting mainly of discussions of examples and homework problems.
- Students are expected to undertake **at least** 10 hours of private study and homework per week.

Assessment procedures:

- Student achievement will be assessed by the following measures:
 - **Class presentations.** Presenting homework problems in class will count as 30% towards the final grade.
 - **Midterm exams.** Midterm tests contribute 30% to the course average.
 - **A 150-minute comprehensive final examination.** The final contributes 40% to the course average.
- Your course performance is your course average (including the final exam score). This is a number between 0 and 100.
- Your final grade is determined according to the following table:

Course performance:	88-100	75-87	62-74	50-61	below 50
Final Grade:	A	B	C	D	F

- In addition your grade maybe raised by a strong performance on the final exam (normally at most one letter grade).