

SYLLABUS: MA 632–2B — ABSTRACT ALGEBRA
SPRING 2020

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

Web site: <http://people.cas.uab.edu/~simanyi/teaching/MA-632/>

Office hours: Tuesdays and Wednesdays, 4:30–6:00, 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.

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