Syllabus: MA 632 – Abstract Algebra  
Spring 2015

Class meets: Tuesday & Thursday 9:30–10:45, CH 458  
Instructor: Dr. Nándor Simányi  
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Office hours: Tuesdays and Thursdays, 5:00–6:30, or by appointment.

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


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.

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