

Math 422/501 - Term 1, 2012-2013

Groups and Fields

Time and Location: MWF 2-3, MATH 102.

Instructor: Kalle Karu
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Textbook: *Advanced Modern Algebra* by Joseph J. Rotman, second edition.

Course description. The main topic of this course is Galois theory of fields. To prepare for this, we also cover topics from group and ring theory.

We will assume knowledge of basic group theory. We start with more advanced topics in the theory of groups, such as group actions, Sylow's theorems, composition series, solvable groups. After group theory we cover basics of ring theory. In the second half of the course we study field extensions and their Galois groups.

Homework. Weekly homework assignments will be handed out each Friday, and they are due the following Friday. You are welcome to discuss the homework problems with other students, or consult other books, but please write up your own solutions.

Exams. We will have one midterm exam during regular class hours on Friday October 24, and the final exam scheduled by the university.

Final Grade. The first midterm exam counts for 20% of your final grade, the final exam for 35%, and the homeworks for 45%.

Other books. *Abstract Algebra* by Dummit and Foote, *Algebra* by Lang, *Algebra* by Artin, *Algebra* by Hungerford.