

## Syllabus, MAS 5312 Galois Theory, Class Number 19744, Spring'14

**Text:** J. Milne, "Fields and Galois Theory"

(available at <http://www.jmilne.org/math/CourseNotes/FT.pdf>)

**Synopsis:** The course is a natural continuation of the Topics in Algebraic Structures course. It is devoted (mainly) to the theory of algebraic extensions (finite or infinite) of fields. Galois discovered that there is a relationship between the theory of fields and the theory of groups. This relationship is known as Galois Correspondence. This correspondence was the first example of how close different areas of mathematics actually are. The theory of the relationship "field extensions/subgroups of groups", known as Galois Theory, is in the center of the course. We will develop the Galois Theory in detail, and will give numerous applications of it, including the standard ones about solving algebraic equations in radicals, and the ancient geometric constructions problems. Galois Theory go far beyond these two applications: it lies in the basis of Algebraic Number Theory (Class Field Theory) and Algebraic Geometry. Grad students interested in Algebra and its applications will have the opportunity to see a fine example in this course.

**Monitoring the progress of the students in class:** The progress of the participants will be monitored through take-home exams, and through their participation in class.