# MATH 560 Field Theory

1. Catalog Description

**MATH 560 Field Theory** **4 units**

Prerequisite: MATH 482 or graduate standing.

Polynomial rings, field extensions, normal and separable extensions, automorphisms of fields, fundamental theorem of Galois theory, and further topics such as solvable groups, solution by radicals, insolvability of the quintic. Not open to students with credit in MATH 483. 4 lectures.

2. Required Background or Experience

Satisfactory completion of the Graduate Written Examination in Algebra.

3. Learning Objectives

The student should attain a deeper understanding of the use of group, ring and field theory in solving difficult problems in the theory of equations.

4. Text and References

To be selected by the instructor.

5. Minimum Student Materials

Paper, pencils and notebook.

6. Minimum University Facilities

Classroom with ample chalkboard space for class use.

7. Content and Method

Topics

a. Field extensions
b. Normal and separable extension
c. Automorphisms of fields
d. Finite fields
e. The Fundamental Theorem of Galois Theory
f. Cyclotomic extensions
g. Solvable groups
h. The insolvability of the quintic

8. Methods of Assessment

Exams, homework, and possibly student presentations.