MATH 561 Graduate Algebra

1. Catalog Description

MATH 561 Graduate Algebra **4 units**

Prerequisite: MATH 483 or MATH 560, and completion of the Graduate Written Exam in Algebra or consent of the Graduate Committee.

An introduction to advanced topics from modern algebra, including group actions, the Sylow theorems, semi-direct products and modules over a principal ideal domain. Other topics may include commutative algebra, advanced Galois theory, homological algebra, and topics from advanced linear algebra. 4 lectures.

2. Required Background or Experience

MATH 482

3. Learning Objectives

Upon completion of the course, students should be able to:

a. Think critically and creatively at an abstract level in algebra.
b. Effectively communicate their work to others.
c. Attain a high level of expertise in the discipline.
d. Understand how advanced modern algebra fits into the greater mathematics framework.
e. Work productively as an individual and/or as a member of a group.
f. Make reasoned and logical arguments in rigorous mathematical proofs.

4. Text and References

- Abstract Algebra by Dummit and Foote
- Algebra by Thomas W. Hungerford
- Advanced Modern Algebra by Joseph J. Rotman
- Algebra by Michael Artin
- Algebra by Serge Lang

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. Introduction to modules
b. Other advanced topics including, for example, commutative ring theory, modules over a PID, advanced group theory.

8. Methods of Assessment

Exams, homework, and possibly student presentations.