

Algebraic Number Theory  
Math 737

Prerequisites:

Math 434 or equivalent.

Topics:

This course is a basic introduction to algebraic number theory. The core of it deals with the ideal theory of Dedekind domains as applied to the rings of integers of number fields (finite extensions of  $\mathbb{Q}$ ). The course will end with the fundamental finiteness theorems: the finiteness of the ideal class group (*via* Minkowski's geometric theory of numbers), and the structure (finite generation etc.) of the unit group. Additional topics which will be discussed if time permits: law of quadratic reciprocity, elementary Diophantine equations, completions ( $p$ -adic numbers).

Text: None. But for those who like to see it in print: Chapter V of Zariski & Samuel, Commutative Algebra, vol. 1, gives a nice, short development of the theory of Dedekind domains, with a little number theory thrown in (quadratic reciprocity). Also Lang's book on number theory covers most of the material of the course (and a great deal besides).