Math 327 Policy Statement Fall, 2007

1. Instructor: B. Dodson, Room 207 XS, Phone x8-3745, Email bad0.

2. Text: Dummit-Foote, Abstract Algebra, 3rd. Edtn. Selected portions of Chapters 1-9 will be covered. There will be additional material handed out on "groups of medium order", especially the 2-groups of order 512 and order 1024. We will also have additional material on the simple composition factors of the Jordan-Holder Theorem (section 3.4); including the orders and names of the finite simple groups, and the list of complex simple Lie algebras.

For rings we will focus on rings of algebraic integers and polynomial rings, including the characterization of unique factorization domains. Special attention will be given to quadratic integers and cyclotomic integers, including the statement of Kronecker's completeness theorem. Abstract group theory will feature examples, statements and proofs of Sylow theory. Attention will be given to p-groups and other nilpotent groups; as well as to lists of transitive permutation groups of small degree (and the relation to number fields).

3. Attendence is required in class.

4. There will be 200 points for Homework.

5. There will be one hour exam, which counts for 100 points. The final exam will count for 200 points.

6. For further study in this subject I hope that you will consider the second semester of this course, Math 428; which in some semesters has continued with Chapters 10-14 of our text. For more on finite groups you might consider Math 472, Group Representations. I usually use the text Linear Representations of Finite Groups, by J.-P. Serre. I recommend the examples in Chapter 5, which includes an unusually clear explicit description of the conjugacy classes in the dihedral groups and the alternating and symmetric groups on four letters. Most of the first two Parts can be read with just linear algebra and a little of Math 327 (Part I having been written for chemistry students).

On the specific topic of simple groups, perhaps the most accessible starting point is the theory of Lie algebras, for which there's another Serre text, Complex semisimple Lie algebras. Students interested in homological algebra or algebraic geometry might consider as an alternate text for Math 327/Math 428, Algebra: an approach via module theory, by Adkins-Weintraub. Prof. Weintraub also has a recent book on representation theory, featuring use of modules.