

MATHEMATICS 722
ABSTRACT ALGEBRA II- SPRING 2007

Course Goals: To develop an understanding of the structure of rings and fields, and Galois theory. To strengthen problem solving and proof techniques in abstract algebra.

Course Content: Rings, polynomial rings, ideals, homomorphisms, quotient rings, adjunction of elements satisfying specified relations, integral domains, fields, fields of quotients, maximal ideals, Hilbert's Nullstellensatz, principal ideal domains, unique factorization domains, Euclidean domains, irreducible and prime elements, Gauss's Lemma, factorization techniques and irreducibility criteria, algebraic extensions, degree of field extension, constructions with ruler and compass, symbolic adjunction of roots, finite fields, and Galois theory. If there is time we will cover modules and the structure of modules over PIDs (applications include the fundamental theorem of finitely generated abelian groups and Jordan canonical form).

Text: *Algebra*, by Michael Artin, Prentice-Hall, Engelwood Cliffs, NJ (1991). Parts of Chapters 10, 11, 13, and 14. If time allows we will cover Chapter 12.

Evaluation:

Homework: Problems will be assigned each class period -- all problems assigned during each week will be collected on the Friday of the week.

Final Exam: In class final exam Wednesday, May 9, 2007, 2-5 PM.

Grading: Final grade will be based on the total points accumulated on two take home tests and final exam.

Test I	100
Test 2	100
Final Exam	200
TOTAL POINTS	400

Honor Code: In signing your name to the tests and the final exam you are certifying, on your honor, that the work is your own.

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Office Hours: Monday, Wednesday, Friday 2 - 4 PM
(in addition, by appointment)