MATH G213 Algebra 3: Galois Theory Spring 2006 - Prof. A. Iarrobino

Scheduled for Mon, Wed 5:50-7:20 at 544 NI:

I plan to move the Monday class to Monday at either 12-1:30, or 3-4:30 PM- AI.

If interested in this course, please drop by my office, 526 NI or contact me by e-mail: a.iarrobino@neu.edu, or phone 617-373-5524, preferably before November 15, 2005.

Official description: First, any needed review of prerequisite material in Hungerford. Studies finite extensions of fields, automorphisms, structure of finite fields, normal and separable extensions, Galois group, Fundamental Theorem of Galois Theory, cyclotomic fields, solvability of equations by radicals, and applications (for example coding theory). Dedekind rings, integral closure of a Dedekind ring in a field extension, ramification theory are possible further but optional topics.

Prerequisites:

Algebra 1, Algebra 2.

Role in the program:

This course studies a beautiful area of mathematics—the application of groups to the theory of algebraic extensions. It continues the study of rings begun in Algebra 2

Goals: Develop your ability and confidence in solving math problems of increasing complexity. Give a chance to reflect on the process of problem solving - of doing mathematics.

Learn Galois theory, one of the more beautiful, accessible subjects in algebra. Get some idea of applications and analogues of Galois theory- as to coding theory, or covering spaces/finite maps.

Prepare for advanced work in algebra, combinatorics, algebraic geometry, topology, or other areas using algebra and fields.

Problem solving: From Hungerford text, and other problems arising in class. I will comment in detail on your solutions. There will be a chance to correct them if needed. Grading is on both quality, and quantity of final work.

For about half of the typical class there will be a lecture to highlight examples, or topics. The other half of the class time will be a chance for individual students to present theorems, solutions of problems, or for the class to solve problems working together. I will encourage a supportive, cooperative atmosphere.

Grading: (Can be adjusted by agreement).

Problem solving	3 units
Presentation, class work	1-2 units
Final Exam	2 units

Course grade is the average of the top five units.

Texts: Hungerford, *Algebra,* Springer GTM Series, Chapter V.
(ISBN 0-38790518-9)

Garling, Galois Theory, Cambridge Univ. Press (paper $20)
(ISBN 0-521-31249-3)

Artin-Milgram Galois Theory, Dover (paper $7)
(ISBN 0486623424)