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Spring '03

Math-627b - Modern Algebra II

Class Meetings: (according to schedule).

Office Hours: After class in BA-210 or by (email) appointment.

Required Text: No text required. There are a number of good textbooks around on the matter. For preparation I recommend a recapitulation of essentials in *Elements of Modern Algebra* by J. Gilbert and L. Gilbert and your notes from Math-627a. Except the chapters dealing with Galois theory, however, the content of this course will be largely independent of that of the foregoing one. Further references will be given in class.

Outline: We will discuss:

- **(a)** Continuation of field theory. Galois theory and solvability by radicals; cyclotomic extensions.
- **(b)** Essentials on rings and modules; projective and injective modules.
- **(c)** Artinian and Noetherian rings and modules, radical and socle.
- **(d)** Semi-simple rings, Artin Wedderburn classification.
- **(e)** Quasi-Frobenius and Frobenius rings.
- **(f)** Galois theory of local commutative rings.

Midterms: There will be 2 midterms at a $1\frac{1}{2}$-monthly basis. Theses are scheduled for Wednesdays, if not announced otherwise.

Assignments: I am planning to assign problem sets regularly. Solving these you are encouraged to work with others, but also required to write down your results independently. Clear exposition in writing proofs is mandatory, and whatever you state requires justification.

Grading Scale: A: 100-85%, B: 84-70%, C: 69-55%, D: 54-40%, F: below 40%.

Note: For each exam one arbitrarily densely written letter-sized sheet of paper (cheat sheet) will be allowed. The weight for the various exams and assignments are given by:

problem sets:	30% each
midterm:	30%
final exam:	30%

First Midterm: (at a certain date).

I wish you good luck and excellent results!