MAT 535, ALGEBRA II, Spring 2001

LECTURES: Tu-Th 12:50-14:10, MATH TOWER P-131

INSTRUCTOR: Mark de Cataldo; Office: MAT 3-115 (math building, third floor, room 115); Phone: 2-8262; e-mail: mde@math.sunysb.edu

OFFICE HOURS: By appointment.


TENTATIVE SYLLABUS (subject to changes):

1. Advanced group theory
   - Structure of finitely generated abelian groups
   - Sylow theorems
   - Free groups
   - Groups given by generators and relations.

2. Rings and modules
   - Rings and fields, examples
   - Homomorphisms, subrings, ideals, quotients, isomorphism theorems
   - Vector spaces and modules, examples
   - Polynomial rings, polynomial functions, factor theorem
   - Integral domains, prime and maximal ideals, field of fractions
   - Principal ideal domains (“PID”), unique factorization theorem
   - Structure theorem for finitely generated modules over PID, examples
   - Tensor, symmetric and exterior algebras as algebras

3. Fields and Galois theory
   - Algebraic elements
   - Construction of field extensions
   - Characteristics, finite fields
   - Geometric constructions by ruler and compass
   - Algebraic closure
   - Splitting field of a polynomial, examples
   - Normal and separable extensions, automorphisms of field extensions
   - Fundamental theorem of Galois theory
   - Applications: construction of regular polygons, fundamental theorem of algebra
   - Nonsolvable equations

FINAL EXAM: There will be a final “take-home” exam. Dates to be announced.

HOMEWORK: Homework will be assigned and graded weekly. Homework is due on tuesdays in class. No exceptions.

GRADE: Based on the final, homework and participation.

SPECIAL NEEDS. If you have a physical, psychiatric, medical, or learning disability that may affect your ability to carry out the assigned course work, please contact the office of Disabled Student Services (DSS), Humanities Building, room 133, telephone 632-6748/TDD. DSS will review your concerns and determine, with you, what accommodations are necessary and appropriate. All information and documentation of disability is confidential.