

Algebra I -- Math 6121 -- Fall 2013 -- Skiles 271, TuTh 9:30-11AM

Instructor: Greg Blekherman, email: greg@math.gatech.edu

Textbooks: *Abstract Algebra* by Dummit and Foote, 3rd edition

Office Hours: Tuesday 2-3PM, Wednesday 1-3PM, *Office:* Skiles 222

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Office Hours: TBA, *Office:* Skiles 142

Course Outline: This course is an introduction to groups, rings and fields. Topics to be covered will include

- **Groups:** homomorphisms, subgroups and quotient groups, normal subgroups, Lagrange's theorem, group actions, Polya's enumeration theory, the class equation, the Sylow theorems, simple groups, direct and semidirect products, the structure theorem for finitely generated abelian groups.
 - **Rings:** ideals, homomorphisms, subrings and quotient rings, Chinese remainder theorem, Euclidean domains, principal ideal domains, unique factorization domains, polynomial rings over fields.
 - **Fields:** homomorphisms, algebraic and transcendental extensions, splitting fields, algebraic closure, arithmetic of finite fields.
 - **Modules:** submodules, quotient modules, free modules, finitely generated modules over a principal ideal domain (if time permits).
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Exams and Homework: Homework will be assigned weekly. There will be two midterms and a final exam. Final exam date and time: December 12, 8-11:50AM.

Homework Assignments:

Assignment 1 is available [here](#).

Grading Policy: The two midterms will each count for 25% of the grade, the final exam is 40% of the grade and homework is 10% of the grade.

Collaboration: On the homework, collaboration is allowed and encouraged. However, the solutions must be written up yourself. Indicate clearly who you have collaborated with on each homework set.

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