Course Description: Introduction to basic algebraic structures. Groups, finite groups, abelian groups, rings, integral domains, fields, factorization, polynomial rings, field extensions, quotient fields.

Prerequisite: Math 311 or consent.


Course Web Page: Assignments and additional material may be found at www.math.hawaii.edu/~jb

Grading: Homework counts 40%, midterms and quizzes 30%, and the final exam is 30%.

Homework: Homework assignments are due on Fridays. You are allowed 4 late assignments; subsequent late assignments will be given half credit. No assignment will be accepted more than 1 week late. You may work together on homework, but avoid straight copying.

Academic Expectations: Cheating on exams will not be tolerated, and will result in failure of the course. We reserve the right to pursue further remedies in aggravated cases.

Learning mathematics requires both study and practice. The instructors cannot learn mathematics for you, we can only guide your efforts. The departmental statement of academic expectations on our web page (www.math.hawaii.edu) applies to all students.

Abstract algebra may be different from your previous mathematics courses. This is the real thing, and to be successful you must master new concepts and a new language. You must learn to think - and write - like a mathematician (for at least a semester). And since I can’t read minds, how well you write will be important.

Some non-computational homework problems will be designated as writing assignments, usually by an asterisk. Your solutions to these should be written clearly, in correct and correctly punctuated sentences, avoiding symbols such as ∀ and ⇒.

You may also be asked to write summaries of certain topics, and are encouraged to do this for your own benefit anyway.

Date: June 5, 2010.
Students must adequately complete all writing assignments to pass the course with a D grade or better. Students who do not complete all writing assignments will fail the course.

Course Outline:

(1) Sets and relations
(2) Algebras, groupoids
(3) Number systems: integers, rationals and reals.
(4) Modular arithmetic.
(5) Rings, polynomial rings, ideals, factorization
(6) Lattices
(7) Euclidean domains and principal ideal domains
(8) Fields
(9) Groups