

**Modern algebra – Math 612**  
**University of Hawai‘i at Mānoa**  
**Spring 2016**

**Meetings:** TTh 10:30am–11:45am, Keller 414

**Lecturer:** Robert Harron                      Email: rharron *at* math.hawaii.edu  
Office: Keller 407                              Office Hours: to be determined

**Course website:** <http://math.hawaii.edu/~rharron/teaching/math612s16/>

**Textbook:** David Dummit & Richard Foote’s *Abstract algebra, Third edition*

**Other sources:** Lang’s *Algebra* (a standard graduate reference), Rotman’s *Advanced modern algebra*, Artin’s *Algebra* (an advanced undergraduate book), Keith Conrad’s blurbs (available at <http://www.math.uconn.edu/~kconrad/blurbs/>)

**Description:** We will cover (hopefully all of) the following topics (all are covered to some extent in Dummit & Foote, and further in Lang and Rotman; additional specific references listed in parentheses below):

- Galois theory (Cox’s *Galois theory*)
- Commutative algebra (Atiyah–Macdonald’s *Introduction to commutative algebra*, Reid’s *Undergraduate commutative algebra*)
- Multilinear algebra
- Homological algebra
- Representation theory (Serre’s *Linear representations of finite groups*)
- Group cohomology (Serre’s *Local fields*, Milne’s *Class field theory*)

**Assignments:** There will be almost-weekly assignments. Problems will be posted after each lecture, then bundled together and due at a specified time each week. Only a subset of the questions will be graded for points, though the rest will still be looked over. You need not type up your assignments in L<sup>A</sup>T<sub>E</sub>X (you are of course more than welcome to), but what you hand in should be neat and well-presented. Aside from the obvious consequence that I will be able to better read and understand what you are trying to say, it will also bring an added layer of critical thought to your work as writing up an argument you’ve already worked out encourages you to process those thoughts over again and can frequently advance your understanding.

**Exams:** There will be a take-home midterm and a take-home final.

**Grading scheme:**

Homework	60%	Midterm	20%	Final	20%
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