Instructor: Prof. Solomon Friedberg  
Office: Maloney Hall 523. Email: friedber@bc.edu. Phone: (617) 552-3002.  
Office hours: Mondays 8-9 a.m., Wednesdays 11 a.m.-12 noon, Thursday 9-10 a.m. and by appointment. (Email me.)  

Class Hours: MWF 9-9:50 a.m., Gasson 308. (We may move to the math department seminar room, Maloney Hall, Room 560, later in the semester.) Attendance at all lectures is required.

Course Description: The year-long course Math 8806-Math 8807 provides a treatment of abstract algebra at the first year graduate level. Topics covered in this semester:

1. Group Theory (groups acting on a set, semi-direct products, the Sylow theorems)
2. Ring Theory (UFDs, PIDs, Gauss’s Lemma, the Eisenstein criterion, localization)
3. Module Theory (modules over a PID, applications to canonical forms)
4. Field and Galois Theory (separable and normal field extensions, Galois theory, finite fields, cyclotomic fields, solvability by radicals, transcendence degree)
5. Basic Number Theory (integral extensions, prime ideals, Dedekind domains).

Prerequisites: You must have had at least one year of proof-based undergraduate abstract algebra, comparable to Boston College’s sequence Math 3311-3312 and covering the topics of groups, subgroups, Lagrange’s Theorem, quotient groups, the homomorphism theorems, rings, ideals, quotient rings, integral domains, field extensions, and Galois theory. You are expected to review material such as the homomorphism theorems and to extend your knowledge if some of this was not treated in your prior class. (If you need any help as you do so, please don’t hesitate to ask me.)

Text: Homework will be handed out in class. So there is no formal required text for this course. However, you might find it helpful to have a copy of Dummit and Foote’s Abstract Algebra as you will be asked to learn some material on your own (also, Prof. Ash plans to require this book for Math 8807 next semester). You may also learn the material this semester from Rotman’s Advanced Modern Algebra. (Other books you might wish to look at are Lang’s Algebra and Jacobson’s Basic Algebra I,II.)

Homework and Grade: Homework will be assigned regularly and one assignment will function as a take-home midterm. You must do the homework on your own, not consulting the internet or getting answers from anyone else or from a book or other source. The final examination will be in-class, and will take place on Friday, December 14, 2018 at 9 a.m. This date and time are fixed by the registrar and may not be changed—no makeups and no early exams. The final counts 40% and the homework counts 60%.

Syllabus date: August 21, 2018.