

## V63.0344 Undergraduate Algebra II, Spring 12

Time	Monday, Wednesday 11:00-12:15
Location	Silver 706
Instructor	Prof. Joel Spencer, wwh 729
Phone	x8-3219
email	lowercaselastname@cims.nyu.edu
Office Hours	Tu 2-4
Text	Topics in Algebra i.n. herstein
Website:	<a href="http://www.cs.nyu.edu/cs/faculty/spencer/algebra/index.html">http://www.cs.nyu.edu/cs/faculty/spencer/algebra/index.html</a>
T.A.	Lukas Koehler
TA Session Time	Fri 9:30-10:45
TA Session Place	TBA
Midterm	Feb 29, in class
Final Exam	May 14, 10-11:50 a.m.
Final Exam	place TBA

This is basically a course in Field Theory with Galois Theory a highlight. We begin with elements of Rings and of Linear Algebra over arbitrary fields. We consider field extensions of the rationals by irrationals such as  $\sqrt{2}$ . We also study Finite Fields. Throughout, number theory provides a wealth of examples and applications. On the opposite side is a *rough* outline of the course. We expect to cover these topics but not necessarily on the precise days indicated. In addition there may be several topics that will only be covered through lecture. Students are responsible for all such material.

For the Galois Theory, notes specially prepared by Prof. Spencer will be made available.

Submission of assignments (unless clearly marked otherwise) will be *mandatory*.

**Special note:** Collaboration on the assignments is *encouraged*. Each student must submit the assignment separately and must note on the assignment the names of other students with which he/she has collaborated.

The final grade will be based 60% on the Final Exam, 35% on the Midterm, and 15% on the Homework. But grades are not determined by an algorithm, subjective factors such as class participation are a “fudge factor” that can carry great weight.

A *tentative* schedule. Check website for changes.

H = Herstein, L= Lecture, N=Notes, GN= Special Galois Theory Notes

CLASS	TOPIC	CHAPTER
Jan 23	Rings	H3.1-3
25	Rings	H3.4,5,7
30	Polynomial Rings	H3.9
Feb 1	Polynomial Rings	H3.10
6	Linear Algebra	H4.1
8	Linear Algebra	H4.2
13	Extension Fields	H5.1
15	Extension Fields	H5.2
20	NOCLASS!!	(Thanks George!)
22	Roots of Polynomials	H5.3
27	Compass-Straightedge	H5.4
29	MIDTERM	–
Mar 5	Finite Fields	H7.1,L
7	Finite Fields	H7.1,L
12	Spring	Break
14	Spring	Break
19	Magic Squares	L
21	Galois	GN
26	Galois	GN
28	Galois	GN
Apr 2	Galois	GN
4	Galois	GN
9	Galois	GN
11	Galois	GN
16	Galois	GN
18	Cyclotomic Polys	L,N
23	Galois-Finite Fields	L
25	Factoring mod p	L,N
30	Fibonacci Plus	L,N
May 2	Fibonacci mod p	L
7	Slack	–