V63.0349 Undergraduate Honors Algebra II, Spring 17

Time	Monday, Wednesday 11:00-12:15
Location	TBA
Instructor	Prof. Joel Spencer, wwh 829
Phone	x8-3219
email	lowercaselastname@cims.nyu.edu
Office Hours	TBA
Text	Algebra
	Michael Artin
`Website:`	http://www.cs.nyu.edu/cs/faculty/spencer/algebra/index.html
T.A.	TBA
TA Session Time	TBA
TA Session Place	TBA
Midterm	TBA (in Class)
Final Exam	As scheduled by University
Final Exam	place TBA

This is basically a course in Ring Theory Field Theory with Galois Theory a highlight. (Note: Group Theory was covered in Undergraduate Honors Algebra I. The few students who haven't taken that course – e.g., visiting students – must be sure they have a good background in Group Theory.) 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. Very roughly, we shall cover chapters 11-16 in Artin's book. However, 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, 30% on the Midterm, and 10% 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.
L= Lecture, N=Notes, GN= Special Galois Theory Notes

CLASS	TOPIC	CHAPTER
Jan 23	Rings	11.1-2
Jan 25	Ideals	11.3
Jan 30	Quotient Rings	11.4-6
Feb 1	Fractions, Maximal Ideals	11.7,8
Feb 6	Factoring, UFD	12.1-2
8	$Z[x]$	12.3-4
13	Gauss Primes	12.5
15	Algebraic Integers	13.1
20	NOCLASS!!	(Thanks George!)
22	Quadratic Integers	13.2
27	Fields	15.1-2
Mar 1	Fields	15.2-3
6	Compass-Straightedge	15.5, L
8	Adjoing Roots	15.6
13	Spring	Break
15	Spring	Break
20	Finite Fields	15.7
22	MIDTERM	(Tentative!)
27	Magic Squares	L
29	Galois	GN
Apr 3	Galois	GN
5	Galois	GN
10	Galois	GN
12	Galois	GN
17	Galois	GN
19	Galois	GN
24	Galois	GN
26	Cyclotomic Polys	L,N
May 1	Representation by Radicals I	L, N
3	Representation by Radicals II	L, N
8	Slack, Review	L