

MATH 210B. ALGEBRA

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Office hours MWF tea time (3:30–4pm) and 4–4:30pm (Conrad); TuTh 5–6:30pm (Ronchetti).

Prerequisites: Math 210A and Math 121. It is assumed that you know undergraduate-level field theory in any characteristic: see Chapter 13 (except in 13.4 only up through Corollary 28) and 14.1–14.7 in Dummit & Foote, especially the worked examples and Theorem 35 in 14.6 as well as <http://math.stanford.edu/~conrad/121Page/homework.html> for Exercises (the historical topics of regular polygons and cubic/quartic formulas in Dummit & Foote are strictly for amusement).

Textbooks: *Algebra* by Serge Lang.

Course description: This is the second quarter of the year-long sequence in algebra at the graduate student level. We will cover feature of finitely generated and infinite-degree algebraic field extensions (allowing inseparability), a lot of commutative algebra, some basic ideas in affine algebraic geometry, and key topics and examples in the representation theory of finite groups.

This material is useful for many topics in advanced pure mathematics which involve algebraic concepts, as well as in differential geometry and Lie theory. This course will move rapidly, so please *don't let yourself fall far behind*.

Homework: Homework is due on every Friday **at the start of class**, submitted on actual paper (electronic submission will never be accepted under any circumstances), and is posted at the course webpage. The TA will pick up the homework shortly after the start of class on each Friday.

The first homework will be posted on the course webpage *before* the first class and it is **due on the first Friday** of the course (it only requires material from Lecture 1 and assumed background in algebra). **Late homework will not be accepted for any reason whatsoever.** However, the lowest homework grade is dropped. (A late homework counts as a zero.) Be careful not to “waste” this option by using it up too early in the quarter!

Exams: There will be no exams.

Grade: The course grade is 100% homework. You may certainly exchange ideas with others on the homework, preferably after thinking things through on your own (and you are encouraged to discuss the material with classmates), but please *write up solutions on your own*; the grader does not want to see multiple verbatim copies of the same solutions. Also, if hand-written then please write legibly and clearly (homework full of scribbled-out hand-written mess all over the place will not be read).