

Fall 2016
Claudia Polini

MATH 80210
Topics in Algebra

This is a basic course in Commutative Algebra. There is no book required for the course. The recommended text is Commutative Algebra with a view towards Algebraic Geometry by David Eisenbud. Other recommended texts are Atiyah and MacDonald: Introduction to Commutative Algebra and Matsumura: Commutative Algebra. The topics to be covered (subject to change) are: Spectra and Localization, Associated Primes and Primary Decomposition, Dimension Theory and Hilbert's Nullstellensatz, Integral Extensions, Discrete Valuation Rings and Dedekind Rings, Homological Algebra (Projective and Injective Modules, Inverse Limits, Complexes, Derived Functors, Ext and Tor, Spectral Sequences), Completions. I will assume knowledge of basic ring theory, module theory (including Hom and tensor product), some familiarity with Noetherian and Artinian rings. I will make available the notes on ring theory and module theory that are prerequisite for the course. There will be 10 sets of HW that we will discuss together each week. We will decide when to meet for the HW discussion (when I am in town we will meet on Friday from 12:30 till 1:45). Students will be required to present the hw problems during the HW discussion. I will send to the registered (or interested) students a set of HW (on basic material) that has to be done by the first week of class.