

ALGEBRA II FALL 08 - SPRING 09

Course description

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The course will concentrate on Local Cohomology. We will follow the Springer Lectures Notes of A.Grothendiek (Notes by R.Hartshorne). The course supposes the level of Algebra I and we will use basic Commutative Algebra that one finds in Atiyah-MacDonald or in Serre's *Algebre locale et multiplicities* (Springer LN). We will explain when needed the notions unfamiliar to the class. Students will be asked to give talks taken from these sources and others.

-Localization

- The Zariski topology of $\text{Spec}(A)$
- Schemes and projective schemes
- The punctured spectrum of a local ring
- The fundamental theorem of Homological Algebra
- Local cohomology
- The duality theorem of A.Grothendiek
- Applications to factoriality criterium, purity of branch locus...