# 代數幾何

課程簡介 The main goal of this course is to introduce the Scheme theory which is the foundation for modern algebraic geometry and the Cohomology theory which is the major technique to define numerical invariants. We intend to have the following contents：

1. Scheme theory：
   - (a) Sheaves：the concept provides a systematic way of keeping track of local algebraic data on a topological space
   - (b) Schemes：they enlarge the category of varieties
   - (c) Important properties：
     integral、noetherian、finiteness、separatedness、properness
   - (d) Coherent sheaves：very useful sheaves on schemes
2. Intrinsic geometry：
   - (a) Linear system：an important tool for studying embedding problem
   - (b) Picard groups：important intrinsic invariants
   - (c) Sheaves of differential : algebraic version of differential forms
3. Cohomology theory：
   We intend to define it by using derived functors and to compute it by introducing Cech cohomology. We also show some important vanishing theorems and combine them with Serre duality to give some applications in flat family、smooth family, including Zariski' s main theorem and base change theorem of cohomology.

主要參考書 : R. Hartshorne, Algebraic Geometry