

Math 244 - Riemann surfaces and algebraic curves

Instructor: Dragos Oprea, oprea@math.you-know-where.edu.

Office hours: Room 382D, Wednesday 3-5pm (tentatively, most likely this will change).

Textbook: Rick Miranda - Algebraic curves and Riemann surfaces (recommended).

Lectures: MWF (10am-10:50pm, 381T).

Webpage: <http://math.stanford.edu/~oprea/244.html>.

Prerequisites: I will assume knowledge of complex analysis and some algebraic topology. It would be good to have seen very basic concepts related to differentiable manifolds. I will take an algebro-geometric viewpoint, but I will not assume a background in algebraic geometry.

Goals: If time allows, the following topics will be covered:

1. Complex manifolds. Riemann surfaces. Basic definitions. Examples.
2. Sheaves and their cohomology. Čech cohomology. Dolbeault cohomology.
3. Divisors and line bundles. Linear systems and projective embeddings.
4. The Riemann-Roch theorem and applications.
5. Serre duality.
6. Riemann-Hurwitz formula.
7. Canonical maps. Classification of curves of low genus.
8. The Jacobian. The Abel-Jacobi map.
9. An introduction to the moduli of curves.