

Outline of Math 602 - Topics in Geometry

The course will cover some basic topics in Riemann surfaces.

- (1) Surface topology: homotopy of maps, the fundamental group, topological classification of closed surfaces
- (2) Differential geometry on surfaces; metrics, curvature, Gauss-Bonnet theorem, conformal structures, holomorphic maps between surfaces, Riemann-Hurwitz formula
- (3) Uniformization theorem for compact Riemann surfaces
- (4) Teichmüller space, hyperbolic surfaces and compactification of Deligne-Mumford
- (5) Surfaces with boundary, Bers' pair of pants decomposition
- (6) Riemann-Roch theorem (if time permits)

Prerequisites: Complex analysis, advanced calculus and linear algebra, basic knowledge about manifolds.