Spring 2010

MATH 81400 - Teichmueller Theory [10302]
Wed., 2:00 - 3:30pm, & Th, 4:15 - 5:45pm, Rm. TBA
4.5 cr.
Prof. Dragomir Saric

Syllabus:

First part (about third of the course):
We introduce and study basic properties of quasiconformal maps of the plane domains and quasisymmetric maps of the unit circle. Then we introduce Teichmüller space of a Riemann surface and study its basic metric and complex structure. Our main focus will be the universal Teichmüller space. Beltrami coefficients of quasiconformal maps are used to vary the complex structure of a surface.

Second part (about two-thirds of the course):
We introduce earthquakes maps of the hyperbolic plane and use earthquake measures as an alternative to Beltrami coefficients in order to vary hyperbolic structures on surfaces. Next topic is the Liouville map from the universal Teichmüller space to the space of geodesic currents on the hyperbolic plane. We use the Liouville map to describe Thurston boundary to the Teichmüller space of an arbitrary Riemann surface. We also consider shears in the universal Teichmüller space.

Third part (if time permits):
We study the Weil-Petersson metric on the universal Teichmüller space. The Hilbert manifold structure on the universal Teichmüller space and some curvature properties are described.

[There is no required textbook.]