

Mathematics 602  
**Introduction to the Theory of Riemann Surfaces**

**Outline**

Riemann's analysis of finite genus one dimensional complex manifolds is a mathematical gem. This course will be an introduction to these manifolds. The topics are

- Definitions and Examples
- Topology of Riemann Surfaces
- Differential Forms
- Integration Formulae
- Hodge Decomposition
- Harmonic Differentials
- Meromorphic Functions and Differentials
- Compact Riemann Surfaces
  - Bilinear Relations
  - The Riemann–Roch Theorem
  - Hyperelliptic Riemann Surfaces
  - Torelli's Theorem
- Additional topics as time permits
  - Automorphisms of Compact Riemann Surfaces
  - Theta Functions

**Prerequisites**

Permission of the instructors. You will need a basic knowledge of complex function theory at the level of **Complex Analysis** by Lars Ahlfors or **Functions of One Complex Variable**, Volume I, by John Conway.

**Text**

- H. M. Farkas and I. Kra, **Riemann Surfaces**, Springer–Verlag, 2<sup>nd</sup> Edition, 1992.

Other possible references include

- A. Beardon, **Riemann Surfaces – A Primer**.
- C. H. Clemens, **A Scrapbook of Complex Curve Theory**.
- R. Miranda, **Algebraic Curves and Riemann Surfaces**.
- G. Springer, **Introduction to Riemann Surfaces**.

**Instructors**

Joel Feldman, Math 221, 822-5660, feldman@math.ubc.ca, <http://www.math.ubc.ca/~feldman/>  
Richard Froese, Matx 1106, 822-3042, rfroese@math.ubc.ca, <http://www.math.ubc.ca/~rfroese/>