

Oral Qualifying Exam Syllabus
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Algebraic Topology

Fundamental group

Van-Kampen Theorem

Covering spaces

Deck transformations

Classification of covering space

Simplicial homology

Singular homology

Exact Sequence and Excision

Cellular homology

Mayer-Vietoris Sequence

Cohomology ring

Cup Product

Poincare Duality

Reference: Allen Hatcher, Algebraic Topology

Riemann Surface

Holomorphic Mappings between Riemann Surface

Branched and unbranched coverings

Differential forms

Algebraic functions

Exact cohomology sequence

Riemann-Roch Theorem

Serre Duality Theorem

Abel's Theorem

Jacobi Inversion Problem

Reference: Otto Forster: Lectures on Riemann Surface.