

MATHEMATICS 722 A1
Introduction to Differential Topology II
Spring Semester 2009

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Lectures: MWF 11-12 in Room MCS B29

Required Text: *Introduction to Smooth Manifolds*, by J. M. Lee; Springer; ISBN 978-0-378-95448-6.

Recommended Text: *Foundations of Differential Geometry, Volume 1*, by S. Kobayashi and K. Nomizu; Wiley; ISBN 978-0471157335

My Office Hours: TBA

Content: This course is a sequel to Differential Topology I (MA 721). We continue to introduce concepts and develop further techniques to study the geometry and topology of smooth manifolds.

Topics to be covered include topological invariants such as deRham cohomology and singular homology; integrability, foliations, and Lie derivatives; Riemannian manifolds and geodesics; Lie group actions on manifolds; principal fiber bundles, connections, and curvature. If time permits, we will apply these concepts to symplectic geometry, the coordinate invariant formulation of phase space and Hamiltonian dynamics, and geometric quantization.

Prerequisites: Students should have taken MA 721 or equivalent.

Homework: Homework will be assigned periodically. Students may discuss homework with each other (and are encouraged to do so) but all written work must be prepared independently.

Exams: There will be a take home final exam.

Grades: 2/3 of the final grade is determined by the homeworks, and 1/3 by the final exam.