

Mathematics 648
Differential Geometry
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This is the introductory course in differential geometry. The basics of the subject are now encountered in many areas of Mathematics and Physics. A sound knowledge of the calculus of several variables and linear algebra are the prerequisites.

The topics covered include: manifolds, mappings, differentials, Sard's theorem, vector fields, one-parameter groups of diffeomorphisms, forms, integration, Stokes' theorem, cohomology, the degree theorem, Riemannian metrics, geodesics, exponential map, curvature, space forms, Gauss-Bonnet theorem. Some applications to Physics will be included. Understanding of the material will be tested by take-home tests and assignments.