

**Applied Mathematics 505**

**Calculus on Manifolds**

Integral and differential calculus on manifolds including tensor fields, covariant differentiation, Lie differentiation, differential forms, Frobenius' theorem, Stokes' theorem, flows of vector fields.

Course Hours: H(3-0)

Prerequisite(s): [Pure Mathematics 445](#) or [545](#); and one of [Applied Mathematics 311](#) or [307](#); or consent of the Division.

*Syllabus*

<u>Topics</u>	<u>Number of Hours</u>
Calculus of Several Variables (Review)	2
Manifolds, Submanifolds, Bundles	3
Vector Fields, Lie transformation groups	8
Tensors, Differential forms	5
Calculus of forms	3
Lie derivative	3
Integration	6
Baby Morse theory OR Covariant Differentiation and Riemannian Geometry	6
<b>TOTAL HOURS</b>	<b>36</b>

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