

## APPLIED MATHEMATICS 505 "CALCULUS ON MANIFOLDS"

**Calendar Description:** H(3-0)

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

**Prerequisite:** Pure Mathematics 445; and one of Applied Mathematics 311 or 307; or consent of the Division.

**Recommended Text:** *Tensors on Manifolds*, 1992 Edition, by Wasserman, Oxford University Press

### *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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