MATH 425/525: Differential Geometry I (Term 1, 2026)

Description: This is a course on smooth manifolds. A manifold is a curved space of arbitrary dimension.

Topics:

- Definition and examples of manifolds
- Tangent vectors
- Submersions, immersions and embeddings
- Submanifolds
- Lie groups
- Vector fields
- Lie derivatives
- Vector bundles
- Tensors
- Differential forms
- Integration on manifolds
- De Rham cohomology

Prerequisites: Undergraduate analysis (e.g. MATH 320) and linear algebra.

Textbook: J. Lee, *Introduction to Smooth Manifolds*, Second Edition.

Midterms: There will be two in-class midterm exams: Friday Oct 9 and Friday Nov 20.

Final Exam: There will be a cumulative final exam scheduled during the UBC examination period.

Grading Scheme: Your total grade will be the highest of the following options:

- **Scheme 1:** Midterm 1 20%, Midterm 2 20%, Final 60%
- **Scheme 2:** Best midterm 30%, Final 70%
- **Scheme 3:** Final 100%