

**THE CHINESE UNIVERSITY OF HONG KONG**  
**Department of Mathematics**

**MATH5070 Topology of Manifolds**  
**First term 2024-2025**

**Grades**

- 30% Homework
- 30% Project
- 40% Final Exam

**Schedule**

Wk	Wednesday (14:30-17:15)	Contents (Tentative)
1	Sep 4	Manifolds: Definition and Examples; Smooth Maps; Tangent Spaces; Differentials
2	Sep 11	Submersion; Immersion; Embedding and Submanifolds; Sard's Theorem
3	Sep 18 (no class)	
4	Sep 25	Partition of Unity; Whitney Embedding Theorem; Vector Fields; Integral Curves; Flows
5	Oct 2	Derivation; Lie Brackets; Lie Derivatives
6	Oct 9	Distributions and Frobenius Theorem; Lie Groups and Lie Algebras
7	Oct 16	Multi-linear Algebra; Vector Bundles
8	Oct 23	Differential Forms; Exterior Derivative; Orientations
9	Oct 30	Integration on Smooth Manifolds; Stokes' Theorem
10	Nov 6 (cancelled?)	
11	Nov 13	De Rham Cohomology: Definition, Homotopy Invariance and Mayer-Vietoris Sequence
12	Nov 20	Cohomology with Compact Support; Degree Theory; Poincare Duality
13	Nov 27	In-class exam
14	Dec 4	Topics?