

THE CHINESE UNIVERSITY OF HONG KONG
Department of Mathematics

MATH5070 Topology of Manifolds, First term 2023-2024

Schedule

Wk	Thursday (14:30-17:15)	Contents (Tentative)
1	Sep 7	Manifolds: Definition and Examples; Smooth Maps; Tangent Spaces; Differentials
2	Sep 14	Submersion; Immersion; Embedding and Submanifolds; Sard's Theorem
3	Sep 21	Partition of Unity; Whitney Embedding Theorem; Vector Fields; Integral Curves; Flows
4	Sep 28	Derivation; Lie Brackets; Lie Derivatives
5	Oct 5	Distributions and Frobenius Theorem
6	Oct 12	Lie Groups and Lie Algebras
7	Oct 19	Multi-linear Algebra; Vector Bundles
8	Oct 26	Differential Forms; Exterior Derivative; Orientations
9	Nov 2	Integration on Smooth Manifolds; Stokes' Theorem
10	Nov 9 (no class)	
11	Nov 16	De Rham Cohomology: Definition, Homotopy Invariance and Mayer-Vietoris Sequence
12	Nov 23	Cohomology with Compact Support; Degree Theory; Poincare Duality
13	Nov 30	In-class exam
14	Dec 7	Sheaf Theory; Cech Cohomology