MATH 562, TOPOLOGY 2—SPRING 2023

REFERENCES AND TOPICS

[Munkres} J. Munkres, Topology
[Lima] E.L. Lima, Fundamental Groups and Covering Spaces (AK Peters, 2003)
[GP] V. Guillemin, D. Pollack, Differential Topology
[Milnor] J. Milnor, Topology from the Differentiable Viewpoint
[Hirsch] M. Hirsch, Differential Topology (Springer)

Topics

1. Fundamental group and covering spaces.

[Lima], 1.1 to 1.4/2.1 to 2.3, 2.5, 2.6/Ch. 6, Ch.7
[Munkres] Ch. 9, Ch. 13

2. Smooth maps of manifolds: topologies, open and generic properties, transversality theorem
[GP] Ch. 2, Ch.3, [lecture notes], [Hirsch] ch. 2, ch. 3

3. Intersection and mod 2 degree and applications
[GP] Ch.3, [Hirsch] Ch. 4

4. Oriented manifolds, oriented double cover; degree of maps, Euler characteristic
[Lima] Ch. 8, [GP] Ch. 4, [Milnor], [Hirsch], ch.5

5. Morse Theory
[Hirsch], ch.6, Milnor's *Morse Theory*

6. Seifert/van Kampen theorem, cell complexes
[Munkres], ch. 11, Hatcher's *Algebraic Topology* 1.2