Study Guide for Topology Exam

General Topology

- Topological spaces, continuous functions, product and quotient topology [1, ch. 2]
- Connectedness and compactness [1, ch. 3]
- Countability and separation axioms, Urysohn lemma, Tietze theorem [1, ch. 4, except §36]
- Complete metric spaces and function spaces [1, §43, 45]

Algebraic Topology

- Classification of surfaces [2, ch. I]
- Fundamental group [2, ch. II], [3, §1.1]
- van Kampen’s theorem [2, ch. III, IV], [3, §1.2]
- Classification of covering spaces [2, ch. V], [3 §1.3]
- Homology:
  - simplicial, singular, cellular; computations and applications [3, ch. 2], [4, ch. 4]
  - Degree of a map of $S^n$ [3, p. 134], [4, §21]
  - Euler characteristic [3, p. 146], Lefschetz fixed point theorem [3, p. 179], [4, §22]

_The weight of topics on the exam should be about 1/3 general topology and 2/3 algebraic topology._

References

  (Revisions and corrections
  http://www.math.cornell.edu/~hatcher/AT/ATpage.html)

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