

# Topics in Geometry & Topology

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1. Introduction
  - Logic
  - Proof Writing
  - Set Theory
2. Euclidean Geometry
  - Axiomatic Systems
  - Euclid's Five Postulates
  - Important Theorems in Euclidean Geometry
3. Neutral Geometry
  - Axioms for Plane Geometry
  - Some Important Theorems in Neutral Geometry
  - Parallel Postulates
  - Statements Equivalent to the Parallel Postulate In Euclidean Geometry
4. Hyperbolic Geometry
  - The Universal Hyperbolic Theorem
  - Some Important Theorems in Hyperbolic Geometry
  - The Critical Function
  - Area and Circles in Euclidean, Neutral, and Hyperbolic Geometries
  - Hyperbolic Geometry Models
5. Topology of the Real Line
  - Equivalence Relations and More Set Theory
  - Open Sets, Closed Sets, and Topologies
  - Continuity
  - Connectedness and Compactness
  - Homeomorphisms

**RECOMMENDED TEXTBOOK:** The geometry portion of the course follows the book *Foundations of Geometry* by Gerard Venema.