

King Fahd University of Petroleum & Minerals
Department of Mathematical & Statistics

PhD Comprehensive Exam: Topology Topics

- Topological Spaces
- Construction of topologies
- The Concept of Convergence: Ultrafilters and Nets
- Continuous Functions, Homeomorphisms
- Connectedness, Compactness
- Countability and Separation Axioms
- The Tychonoff Theorem
- Metrization Theorems and Paracompactness
- Complete Metric Spaces and completion of a metric space, Banach Fixed point theorem
- Function Spaces, Pointwise and compact convergence, Ascoli's theorem, Stone-Weirstrass theorem
- Baire Spaces
- Homotopy of paths, The Fundamental Group
- Fundamental group of the circle
- Retractions and fixed points, Brouwer's fixed-point theorem.

Related Courses:

MATH 521 and MATH 621