



TOPOLOGY I & II
21:640:441, 442 (3 credits, 3 credits)

COURSE DESCRIPTION:

General topological spaces and continuous mappings; linear point set theory and plane point set theory; separation, connectedness, and compactness; localization; topological products and Tychonoff's theorem; metric spaces and isometries.

PREREQUISITE:

21:640:238 (Foundations of Modern Math), or permission of instructor.

TEXTBOOK: "Introduction to Topology," (3rd edition), by Bert Mendelson, published by Dover Publications.

DEPARTMENT WEB SITE: <http://www.ncas.rutgers.edu/math>

THIS COURSE COVERS THE FOLLOWING CHAPTERS AND SECTIONS:

Chapter 2, 12–21:

Topological spaces and continuous functions. Topological spaces; basis for a topology; order, product, and subspace topology; closed sets and limit points; continuous functions; metric topology.

Chapter 3, 23-24 & 26–28:

Connectedness and compactness. Connected spaces; compact spaces; connected and compact subsets of the real line; limit point compactness; contraction mapping theorem.

Chapter 4, 30–32:

Countability and separation. Countability and separation axioms, normal spaces, statements of Urysohn's Lemma and Tietze Extension Theorem.

Chapter 5, 37:

The Tychonoff theorem.

Chapter 6, 39–41:

Metrization theorems. Nagata-Smirnoff Metrization Theorem (statement only); paracompactness; applications.

Chapter 7, 43–45:

Complete metric spaces. Complete metric spaces; space-filling curve; compactness in metric spaces

Chapter 9, 51–57:

The fundamental group. Basic definitions; the fundamental group of the circle; retractions and fixed points; Borsak-Ulam Theorem; Fundamental Theorem of Algebra.

Other Topics:

If time permits, we will also study the Seifert-van Kampen Theorem, and the classification of surfaces.

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