

# The Department of Mathematics

2024–25–A term

**Course Name** Basic Concepts in Modern Analysis

**Course Number** 201.2.0351

**Course web page**

<https://www.math.bgu.ac.il/en/teaching/fall2025/courses/basic-concepts-in-modern-analysis>

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**Office Hours** <https://www.math.bgu.ac.il/en/teaching/hours>

## Abstract

## Requirements and grading<sup>1</sup>

## Course topics

Banach spaces and Hilbert spaces. Basic properties of Hilbert spaces. Topological vector spaces. Banach-Steinhaus theorem; open mapping theorem and closed graph theorem. Hahn-Banach theorem. Duality. Measures on locally compact spaces; the dual of  $C(X)$ . Weak and weak-\* topologies; Banach-Alaoglu theorem. Convexity and the Krein-Milman theorem. The Stone-Weierstrass theorem. Compact operators on Hilbert space. Introduction to Banach algebras and Gelfand theory. Additional topics as time permits.

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<sup>1</sup>Information may change during the first two weeks of the term. Please consult the webpage for updates