האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

FUNDAMENTAL CONCEPTS IN FUNCTIONAL ANALYSIS - 80600

Last update 06-12-2023

HU Credits: *6*

Degree/Cycle: *2nd degree (Master)*

Responsible Department: *Mathematics*

Academic year: *2024*

Semester: *1st Semester*

Teaching Languages: *English and Hebrew*

Campus: *E. Safra*

Course/Module Coordinator: *Dr. Cy Maor*

Coordinator Email: *cy.maor@mail.huji.ac.il*

Coordinator Office Hours: *by appointment*

Teaching Staff:
Dr. Cy Maor,
Mr. Daniel Rosenblatt

Course/Module description:
A course in fundamental concepts in analysis, particularly the theory of Banach and Hilbert spaces

Course/Module aims:
Acquaintance with central concepts in functional analysis up to the 1950s.

Learning outcomes - On successful completion of this module, students should be able to:
Ability to prove theorems in Functional Analysis.

Ability to demonstrate the theorems taught in the course with examples and counter-examples.

Acquaintance with central concepts in functional analysis up to the 1950s.

Solve problems in functional analysis.

Attendance requirements(%):
0

Teaching arrangement and method of instruction: Lectures and exercises

Course/Module Content:
Hilbert and Banach Spaces.
Linear transformations.
Dual space.
Topological vector spaces.
The Uniform Boundedness Pinciple.
The Hahn-Banch theorem. The Open Mapping theorem.
Weak topologies, Banach-Alaoglu theorem.
Other or additional topics may be studied.

Required Reading:
none

Additional Reading Material:
B. Weiss, J. Lindenstrauss, A. Pazy, Functional Analysis
W. Rudin, Functional Analysis
W. Rudin, Real and Complex Analysis

Grading Scheme:
Written / Oral / Practical Exam 90 %
Submission assignments during the semester: Exercises / Essays / Audits / Reports / Forum / Simulation / others 10 %

Additional information:
none