



The Hebrew University of Jerusalem

Syllabus

Functional analysis - 80417

Last update 19-04-2024

HU Credits: 3

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Mathematics

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Dr. Cy Maor

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

Coordinator Office Hours:

Teaching Staff:

Dr. Cy Maor,
Mr. Guy Sapire

Course/Module description:

Introduction to functional analysis

Course/Module aims:

To be familiar with basic definitions, examples, and theorems of functional analysis.

Learning outcomes - On successful completion of this module, students should be able to:

On successful completion of the course students will know basic definitions, examples and theorems of functional analysis, with emphasis on the space of continuous functions on an intervals and Fourier series.

Attendance requirements(%):

Teaching arrangement and method of instruction: Lecture+recitation

Course/Module Content:

- 1) Infinite-dimensional normed spaces, examples, equivalence.*
- 2) Totally bounded sets.
Equicontinuity and the Arzela-Ascoli theorem.*
- 3) Completion of normed spaces, the Baire Theorem and the existence of continuous nowhere differentiable functions.*
- 4) The Weierstrass approximation theorem for $C[0,1]$. The Stone-Weierstrass theorem.*
- 5) Infinite dimensional inner product spaces. Complete orthonormal systems. The Parseval equality.*
- 6) Fourier series, Fejer and Dini kernels, pointwise and uniform convergence of Fourier series.*

Required Reading:

None

Additional Reading Material:

Grading Scheme:

Written / Oral / Practical Exam 90 %

Submission assignments during the semester: Exercises / Essays / Audits / Reports
/ Forum / Simulation / others 10 %

Additional information: