



The Hebrew University of Jerusalem

Syllabus

FUNDAMENTAL CONCEPTS IN SPECTRAL ANALYSIS - 80601

Last update 15-05-2024

HU Credits: 6

Degree/Cycle: 2nd degree (Master)

Responsible Department: Mathematics

Academic year: 2024

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Yoram Last

Coordinator Email: ylast_at_math.huji.ac.il

Coordinator Office Hours:

Teaching Staff:

Prof Yoram Last,
Mr. Leder Roe

Course/Module description:

Banach algebras (Basics, ideals, spectrum), C^* algebras (Basics, positive elements, states and representations, the GNS construction and Gelfand-Neumark theorem), von Neumann algebras, introduction to spectral theory of self-adjoint operators on Hilbert spaces.

Other or additional topics may also be studied.

Course/Module aims:

See learning outcomes

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

Ability to prove and apply the theorems presented in the course.

Ability to apply correctly the mathematical methodology in the context of the course.

Acquiring the fundamentals as well as basic familiarity with the field which will assist in the understanding of advanced subjects.

Ability to understand and explain the subjects taught in the course.

Attendance requirements(%):

Teaching arrangement and method of instruction: Lecture + exercise

Course/Module Content:

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Other or additional topics may also be studied.

Required Reading:

none

Additional Reading Material:

R.V. Kadison & J.R. Ringrose, Fundamentals of the Theory of Operator Algebras. Volume I: Elementary Theory, Academic Press 1983

M. Reed & B. Simon, Methods of Modern Mathematical Physics. I: Functional Analysis (Revised and Enlarged Edition), Academic Press 1980

Grading Scheme:

Written / Oral / Practical Exam 90 %

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

Additional information:

If the exercise grade will be higher than the exam grade, the exercise grade will be 20% of the final grade and the exam grade will be 80% of the final grade.