

The Hebrew University of Jerusalem

Syllabus

MEASURE THEORY - 80517

Last update 29-09-2024

HU Credits: 4

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Mathematics

<u>Academic year:</u> 0

<u>Semester:</u> 1st Semester

<u>Teaching Languages:</u> Hebrew

<u>Campus:</u> E. Safra

<u>Course/Module Coordinator:</u> Dr. Or Landesberg

Coordinator Email: or.landesberg@mail.huji.ac.il

Coordinator Office Hours:

Teaching Staff:

Dr. Or Landesberg, Mr. Keren Daniel

Course/Module description:

Measurable sets and functions, measures, integrals, fundamental limit theorems for integrals, the Riesz representation theorem, regularity of measures, Lebesgue measure, Lusin's theorem, spaces of integrable functions and fundamental inequalities, the Radon-Nikodym and Lebesgue decomposition theorems, measure differentiation, product spaces and the Fubini theorem. Other or additional topics may also be studied.

<u>Course/Module aims:</u> 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.

<u>Attendance requirements(%):</u> 0

Teaching arrangement and method of instruction: Lecture + exercise

Course/Module Content:

Measurable sets and functions, measures, integrals, fundamental limit theorems for integrals, the Riesz representation theorem, regularity of measures, Lebesgue measure, Lusin's theorem, spaces of integrable functions and fundamental inequalities, the Radon-Nikodym and Lebesgue decomposition theorems, measure differentiation, product spaces and the Fubini theorem. Other or additional topics may also be studied.

<u>Required Reading:</u> none

Additional Reading Material:

W. Rudin, Real and Complex Analysis, 3rd edition, McGraw-Hill 1986

<u>Grading Scheme:</u> 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.