



## Syllabus

### PROBABILITY THEORY (2) - 80421

*Last update 19-09-2022*

HU Credits: 3

Responsible Department: Mathematics

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Ori Gurel-Gurevich

Coordinator Email: [origurel@math.huji.ac.il](mailto:origurel@math.huji.ac.il)

Coordinator Office Hours: By appointment

Teaching Staff:

Prof Ori Gurel-Gurevich

Course/Module description:

*A second course in probability theory, from the standpoint of measure theory. The*

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course revolves around stochastic processes, their invariants and convergence. These topics are studied via classical tools such as characteristic function, and modern tools such as martingales.

Course/Module aims:

Same as in learning outcomes.

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

Establishing probability theory on the shoulders of measure theory.

Ability to prove the fundamental theorems in that theory in a general form.

Relating probability theory and harmonic analysis via characteristic functions.

Understanding discrete stochastic processes through the notion of a martingale.

familiarity with the Wiener process (Brownian motion), and deriving its basic properties from simple random walks.

Attendance requirements(%):

0

Teaching arrangement and method of instruction: Lecture

Course/Module Content:

Convergence of random variables  
Law of large numbers  
Characteristic functions  
Central limit theorem  
Martingales  
Other or different topic may be taught

Required Reading:

Lecture notes

Additional Reading Material:

Probability with martingales / Williams

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*Grading Scheme:*

*Additional information:*  
*none*