האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

MATHEMATICS FOR STATISTICIANS - 52617

Last update 21-08-2014

HU Credits: *3*

Degree/Cycle: *1st degree (Bachelor)*

Responsible Department: *Statistics*

Academic year: *2*

Semester: *2nd Semester*

Teaching Languages: *Hebrew*

Campus: *Mt. Scopus*

Course/Module Coordinator: *Benjamin Yakir*

Coordinator Email: *benjamin.yakir@huji.ac.il*

Coordinator Office Hours: *Mondays, 12:30-13:30*

Teaching Staff:

Prof Benjamin Yakir
Lily Agranat

Course/Module description:
The course presents central themes from Measure Theory - the mathematical basis of Probability Theory. For that goal the course describes relevant branches of mathematics that are relevant for understanding the mathematical derivations.

Course/Module aims:
The main goal of the course is the preparation of the student towards the course in probability and stochastic processes that is required in the masters degree. A large part of the probabilistic subjects from that course are presented in a slower pace with an attempt to understand the background and the motivations.

Learning outcomes - On successful completion of this module, students should be able to:
1. To quote and apply the definitions that were presented in the course.
2. To restore independently the proofs of the claims that were stated in the course.
3. To describe at least 1 example in the context of any claim.
4. To prove independently simple variants of claims that were stated in class.

Attendance requirements(%):
No attendance requirement

Teaching arrangement and method of instruction: The methodical material of the course will be presented weekly in the form of a collection of 5-6 short video clips. These video clips will be available for the students on the web.

The video clips will be accompany by computerized quizzes to be submitted each week and an assignment in writing.

Two weekly meeting will be held. In the first meeting we will go over the lectures and answer questions. The computerized quiz should be submitted by the second meeting. An in-class assignment will be filled by the students during the second meeting. The weekly material will be summarized and a preface towards the lectures of the subsequent week will be provided.

Course/Module Content:
1. Cantor's set theory.

2. Introduction to measure theory.
3. The construction of a measure.
4. Measurable functions.
5. Measurability of the limit of a sequence.
6. Integration (part a).
7. Integration (part b).
8. Integral convergence theorems.
9. The computation of integrals.
10. Independence and product measures.
11. The strong law of large numbers.
12. Approximations of functions.
13. The central limit theorem.

Required Reading:
You are required to watch the video clips every week before the first class.

Additional Reading Material:
Dorrett, R: Probability, theory and examples

Abbott, S: Understanding Analysis

Course/Module evaluation:
End of year written/oral examination 70 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 15 %
Reports 0 %
Research project 0 %
Quizzes 15 %
Other 0 %

Additional information: