האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

Statistical Inference and Its Applications - 52325

Last update 31-10-2020

HU Credits: 6

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Statistics

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: Mt. Scopus

Course/Module Coordinator: Pavel Chigansky

Coordinator Email: Pavel.Chigansky@gmail.com

Coordinator Office Hours: by appointment

Teaching Staff:

Prof Pavel Chigansky,
Ms. rachel buchuk

Course/Module description:
Introduction to Statistical Theory

Course/Module aims:
Theoretical understanding of the statistical tool box.

Learning outcomes - On successful completion of this module, students should be able to:
1. To understand the theoretical justification of statistics.
2. To understand the mathematical foundation of statistics.
3. To understand the basic definitions.

Attendance requirements(%):
0%

Teaching arrangement and method of instruction: Lectures and exercises.

Course/Module Content:
1. Statistical Models

Inferential versus descriptive statistics,
parametric and nonparametric models,
likelihood function,
identifiability,
sufficient statistic,
exponential families of distributions.

2. Estimation in parametric models

Refresh on estimation methods,
elements of Decision Theory, Bayesian estimation,
Unbiased estimation (Rao-Blackwell improvement, complete statistic and Lehmann–Scheffé theorem, Fisher information and Cramer-Rao bound),
large sample asymptotic estimation and confidence sets.

3. Hypotheses testing in parametric models

Elements of Decision Theory,
Neyman-Pearson lemma and the likelihood ration test,
examples of UMP tests,
Generalized likelihood ration test,
Pearson's test

Required Reading:
N-A

Additional Reading Material:
Lecture notes will be distributed during the course. Additional recommended reading:

Felix Abramovich and Ya'acov Ritov: Statistical Theory: A Concise Introduction

P.Bickel, K.Doksum, Mathematical Statistics: basic ideas and selected topics, 1977

Casella, George; Berger, Roger L. Statistical inference, 1990.

Course/Module evaluation:
End of year written/oral examination 80 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 20 %
Other 0 %

Additional information: