Syllabus

Statistical Inference and Its Applications - 52325

Last update 07-01-2024

<u>HU Credits:</u>   6

<u>Responsible Department:</u> Statistics

<u>Academic year:</u> 0

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

<u>Teaching Languages:</u> Hebrew

<u>Campus:</u> Mt. Scopus

<u>Course/Module Coordinator:</u> Ariel Jaffe

<u>Coordinator Email:</u> Pavel.Chigansky@gmail.com

<u>Coordinator Office Hours:</u> Sundays, 18:30-19:30

<u>Teaching Staff:</u>
 Dr. Ariel Jaffe,
Ms. Alon Shira

<u>Course/Module description:</u>

Introduction to Statistical Theory

Course/Module aims:
  To explain theoretical foundations behind statistical methods

Learning outcomes - On successful completion of this module, students should be able to:
  to understand theoretical foundations of statistical inference

Attendance requirements(%):
  None

Teaching arrangement and method of instruction: In-class lectures and TA sessions.

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￿Scheff© 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

Required Reading:
 None

 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.

 Grading Scheme:
  Written / Oral / Practical Exam 65 %
 Mid-terms exams 35 %

Additional information: