



The Hebrew University of Jerusalem

Syllabus

Advanced Data Analysis - 77742

Last update 16-08-2018

HU Credits: 4

Degree/Cycle: 2nd degree (Master)

Responsible Department: Physics

Academic year: 0

Semester: 1st Semester

Teaching Languages: English

Campus: E. Safra

Course/Module Coordinator: Dr. Assaf Horesh

Coordinator Email: assafh@mail.huji.ac.il

Coordinator Office Hours: by appointment

Teaching Staff:

Dr. Assaf Horesh

Course/Module description:

The class will teach advanced methods of analyzing experimental and observational data and will introduce the relevant statistical and numerical tools

Course/Module aims:

To teach advanced methods of data analysis

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

1. Calculation of prob. distributions and fitting to experimental data including noise and systematics
2. Fitting and analysis of BIG DATA
3. Applying Bayesian analysis
4. Using Monte-Carlo integration
5. Analyze dynamical multi-scale time series
6. Multi dimensional stochastic optimization

Attendance requirements(%):

Teaching arrangement and method of instruction: Lectures

Course/Module Content:

Intro to data analysis
Probability distributions
Generating functions, moments, and central moments
Covariance and correlation matrices
Fitting and hypothesis testing
PCA
Bootstrap and Jackknife methods
Bayesian statistics
Monte-Carlo methods
Dealing with statistical and systematic uncertainties
Advanced and numerical methods

Required Reading:

None

Additional Reading Material:

None

Course/Module evaluation:

End of year written/oral examination 0 %

Presentation 0 %

Participation in Tutorials 0 %

Project work 100 %

Assignments 0 %

Reports 0 %

Research project 0 %

Quizzes 0 %

Other 0 %

Additional information:

open for third year students, by approval