האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

Advanced Mathematical Tools for data science - 52000

Last update 30-07-2021

HU Credits: 3

Degree/Cycle: 2nd degree (Master)

Responsible Department: Statistics

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: Mt. Scopus

Course/Module Coordinator: Prof. Offer Kella

Coordinator Email: offer.kella@gmail.com

Coordinator Office Hours: By appointment

Teaching Staff:

Prof Offer Kella

Course/Module description:

The course deals with mathematical tools in various fields which are necessary for the understanding and application of algorithms and various methods in the analysis of multivariate data or complex data.

Course/Module aims:

The study of mathematical tools for the statistical analysis of complex data.

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

On successful completion of this module, students should be able to employ mathematical results in the areas of calculus, linear algebra, the multivariate normal distribution, and discrete time Markov chain in order to apply them in the context of data analysis.

Attendance requirements(%):

None.

Teaching arrangement and method of instruction: In class lectures and in class and homework exercises.

Course/Module Content:

Upper and lower bounds, uniform continuity, the chain rule for multivariate functions, inverse function theorem, singular value decomposition of a matrix, pseudo inverse of matrices, matrix norm, matrix exponential, the multivariate normal distribution, the Wishart distribution, discrete time Markov chains, continuous time processes, linear space, norm, Cauchy-Shwartz inequality, inner product spaces, distances.

Required Reading:

None.

Additional Reading Material:

If the need arises, will be given during the course.

Course/Module evaluation:

End of year written/oral examination 100 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information: