The Hebrew University of Jerusalem

Syllabus

Advanced Biostatistics - 72920

Last update 22-10-2019

HU Credits: 3

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Life Sciences

Academic year: 0

Semester: 1st Semester

Teaching Languages: English and Hebrew

Campus: E. Safra

Course/Module Coordinator: Prof. Liran Carmel

Coordinator Email: liran.carmel@huji.ac.il

Coordinator Office Hours: by email

Teaching Staff:

Prof Liran Carmel
Ms.

Course/Module description:
The course teaches statistical techniques that are relevant to the biological research.

Course/Module aims:
Providing students with statistical techniques that are highly useful in Biological research.

Learning outcomes - On successful completion of this module, students should be able to:
Apply the appropriate statistical analyses required in their particular research.

Attendance requirements(%):
100

Teaching arrangement and method of instruction: Lectures + frontal exercises

Course/Module Content:
1. Estimators: point estimators, properties of estimators, basic estimators, maximum-likelihood estiamtors, the method of moments.
2. Bootstrapping.
3. ANOVA test, post-hoc tests.
4. Ranked statistics: U-test, Wilcoxon test and related tests.
5. Multiple comparisons: Bonferroni, FDR
6. Permutation tests.
7. Dimensionality reduction: PCA, t-SNE.
8. Classification and logistic regression.
More topics if time permits: multiple linear regression, Analysis of contingency tables: hypergeometric test, Fischer exact test, Markov models and its applications in Biology.

Required Reading:
None

Additional Reading Material:

Zar, Biostatistical Analysis, 5th edition

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

Additional information:
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