The Hebrew University of Jerusalem

Syllabus

Computational Biostatistics - 72942

Last update 08-08-2021

HU Credits: 3

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Life Sciences

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Liran Carmel

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

Coordinator Office Hours:

Teaching Staff:

Prof Liran Carmel,
Ms. Chen Leibson

Course/Module description:
We will study important statistical methods that are frequently encountered in analyses of biological data. Emphasis will be given to the mathematical foundations of the methods.

Course/Module aims:
Knowledge of statsitical tools required for analysis of biological data, for researchers with computational orientation.

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(%):

Teaching arrangement and method of instruction: Lectures + forntal exercises + excercises

Course/Module Content:
1. Formal theory of hypothesis testing.
2. Estimators: point estimators, interval estimators, properties of estimators, basic estimators.
3. Data sampling, experimental design, analysis of variance.
4. ANOVA test, post-hoc tests.
5. Multiple comparisons: Bonferroni, FDR
6. Ranked statistics: U-test, Wilcoxon test and related tests.
7. Linear regression: one-dimensional regression, multiple regression, logistic regression.
8. Dimensionality reduction: PCA, t-SNE.
9. Analysis of contingency tables: hypergeometric test, Fischer exact test.
10. Randomization tests: Bootstrap, jackknife.
11. Markov models and its applications in Biology.

Required Reading:

none

Additional Reading Material:

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: