



The Hebrew University of Jerusalem

Syllabus

ADVANCED ANALYSIS OF HIGH-THROUGHPUT EXPERIMENTS - 71216

Last update 22-03-2020

HU Credits: 2

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Plant Sciences in Agriculture -Special in Biotec

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: Rehovot

Course/Module Coordinator: Ido Carmel

Coordinator Email: ido.carmel@mail.huji.ac.il

Coordinator Office Hours: By Appointment

Teaching Staff:

Dr. Ido Carmel

Course/Module description:

A significant portion of the new technologies in experimental biology are "high-throughput" i.e. produce huge amount of raw data as an output. This data is further processed using diverse inventory of software to produce biological insights and a large part of the data is available online. The course "Advanced Analyses" introduces these technologies, software tools used for analyzing their results and relevant databases. The course combines frontal lectures and hands-on sessions that will provide the students with a basic knowledge of experimental design and data analyses using the systems biology approach.

Course/Module aims:

1. Introduction of the recent technologies for high-throughput experiments, the obtained biological insights from each technology, its advantages and limitations.
2. Practicing basic bioinformtic analyses of high throughput data using the relevant software tools

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

- 1) The student will understand manuscripts with experiments and analysis in the Systems Biology approach.
- 2) The student will be able to propose the suitable high-throughput technology to address specific research questions/tasks

Attendance requirements(%):

100

Teaching arrangement and method of instruction: frontal lectures, hands on sessions and home assignments

Course/Module Content:

1. introduction to Genomics
2. UCSC Genome Browser (Practical session)
3. Transcriptomics: Microarrays and Next Generation Sequencing.

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4. *Transcriptomics: High-Level Analysis (including Practical session)*
 5. *Biological network, Cytoscape (Practical session)*

Required Reading:

None

Additional Reading Material:

A Primer of Genome Science/Gibson & Muse

Introduction to Genomics

Arthur Lesk

Course/Module evaluation:

End of year written/oral examination 0 %

Presentation 0 %

Participation in Tutorials 5 %

Project work 0 %

Assignments 90 %

Reports 0 %

Research project 0 %

Quizzes 0 %

Other 5 %

Attendance

Additional information:

Students are advised to take before or at the same time, course 71437 "Introduction to Bioinformatics".

Limited to 20 students.