



## *The Hebrew University of Jerusalem*

### *Syllabus*

## **GENETIC ENGINEERING - 71184**

*Last update 05-03-2023*

*HU Credits:* 3

*Degree/Cycle:* 2nd degree (Master)

*Responsible Department:* Genetics & Breeding

*Academic year:* 0

*Semester:* 2nd Semester

*Teaching Languages:* English

*Campus:* Rehovot

*Course/Module Coordinator:* Shilo Rosenwaser

*Coordinator Email:* [hanokh.czosnek@mail.huji.ac.il](mailto:hanokh.czosnek@mail.huji.ac.il)

*Coordinator Office Hours:*

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Teaching Staff:

Prof Sivan Berta,  
Prof Hanokh Czosnek,  
Dr. Shilo Rosenwaser,  
Mr. noam cohen,  
Mr. moshik shtainberg

Course/Module description:

History and current applications of genetic engineering. Tool box for genetic modifications. Reading, writing and editing DNA. Cloning and DNA assembly. Synthetic biology, gene circuits and components libraries. Protein design. Genetic modifications of plants, yeast and animals. Real world problems: positional effects, trait stacking, silencing and environmental interactions. genetic engineering in animals; CRISPR; transgenic mice

Course/Module aims:

Introduction to technologies and philosophy of genetic engineering of living organisms.

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

Understand and analyse up to date research.

Attendance requirements(%):

Teaching arrangement and method of instruction: lecture and exercises

Course/Module Content:

Muagenesis: chemical, enzymatic, zinc fingers, TALENs - Overproduction of foreign proteins in bacteria: plasmid and phage expression vectors - Genetic engineering in yeast: transformation vectors, expression of foreign proteins, protein-protein interaction.

Sequencing (from Sanger to third generation high throughput sequencing),

DNA sequencing applications (whole genome sequencing),

Plant transformation via Agrobacterium

Transgenic plant in research and agriculture,

CRISPR (background and application),

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Required Reading:  
relevant scientific publications

Additional Reading Material:

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: