האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

Advanced approaches and methods in plant ecology - 71911

Last update 16-09-2024

HU Credits: 3

Degree/Cycle: 2nd degree (Master)

Responsible Department: Plantsciences in Agriculture

Academic year: 0

Semester: 2nd Semester

Teaching Languages: English

Campus: Rehovot

Course/Module Coordinator: Prof. Efrat Sheffer

Coordinator Email: efrat.sheffer@mail.huji.ac.il

Coordinator Office Hours: Contact via email

Teaching Staff:
Prof. Efrat Sheffer

Course/Module description:
The course will examine various aspects of research in plant ecology ranging from plant strategies at the level of the individual plant, through ecological processes that control plant population dynamics and plant communities, to processes at the level of the ecological system (ecosystem). Students will learn about the main research approaches and methodologies in the study of the ecology of plant populations and communities, with special focus on quantitative methods. Conditions permit, the students will conduct a field survey of plants (as part of a field trip) and analyze the data (as part of computational laboratories and work reports). The goal of these assignments will be to expose the students to hands-on experience in research tools to evaluate how biotic and abiotic factors influence the structure, function, and dynamics of plant communities.

Course/Module aims:

Learning outcomes - On successful completion of this module, students should be able to:
Students will know how to distinguish between levels of organization and will understand the types of ecological questions asked for each of these levels and the research approaches developed for each level of biological organization.

Attendance requirements(%):
100

Teaching arrangement and method of instruction: Lectures, computer exercises, field trip (if possible)

Course/Module Content:
1. Population ecology: measuring, monitoring and predicting plant population dynamics.
- Static and dynamic life tables (Exercise #1)
- Transition tables (Leslie matrix) using Markov chain models (Exercise #2)
- Models of population demography in changing environments and density dependence.
2. The plant community:

- Succession theories.
- Measures of species richness and diversity, research methods (Exercise #3).
- Community diversity and composition as affected by environmental conditions – using multivariate statistical methods (ordinations; Exercise #4).
3. The plant community – species interactions, models to explain community structure and dynamics.
4. Individual level - life forms, growth, reproduction, fertilization, pollination and dispersal
- Individual level - life history traits and strategies
5. Comparing ecological models at different levels of organization.
6. Plant community and ecosystem interactions:
- Ecosystem productivity and species richness.
- Species richness and ecosystem stability.

Required Reading:
A list of optional articles will be provided prior to each class

Additional Reading Material:

Grading Scheme:
Essay / Project / Final Assignment / Home Exam / Referat 50 %
Submission assignments during the semester: Exercises / Essays / Audits / Reports / Forum / Simulation / others 40 %
Attendance / Participation in Field Excursion 10 %

Additional information: