

## *The Hebrew University of Jerusalem*

### *Syllabus*

### *invitation to plant ecology and evolution - 72145*

*Last update 24-07-2014*

*HU Credits:* 2

*Degree/Cycle:* 1st degree (Bachelor)

*Responsible Department:* Life Sciences (Biology)

*Academic year:* 1

*Semester:* 1st Semester

*Teaching Languages:* Hebrew

*Campus:* Mt. Scopus

*Course/Module Coordinator:* Prof Avi Shmida

*Coordinator Email:* [shmida@math.huji.ac.il](mailto:shmida@math.huji.ac.il)

*Coordinator Office Hours:* Feldman building, 14-16

*Teaching Staff:*

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Prof Avi Shmida

Course/Module description:

The course presents basic principles of ecology and evolutionary biology by learning and analyzing the natural system of the "Pollination Market": The biology of flowers and their pollinators. Morphologies and behaviors of flowers, Bees, Flies, Beetles, Butterflies and Wasps, as well as Birds and Bats are described in the context of pollination and the adaptive value that each side is taking in such an "assignment game" is studied. Different patterns of Sex-Types in plants are explained by game theoretical approach e.g.: Why most flowers are Hermaphrodite?, How to choose good males? and why usually the Sex-Ratio is 1 : 1?. Basic rational principles from Biology and Economic are demonstrated in bees' behavior and flowers' patterns, such as: flower size and longevity, flower colors and insect vision, wind versus animal pollination, relation between reward and advertisement, foraging strategies, inflorescence structure and sex allocation.

Course/Module aims:

Studying the basic evolutionary mechanisms of organismic biology, by using the two-sided pollination market with bees and flowers as a model. Emphasis will be placed on aspects of sexual allocation problems that have shaped the behaviors and morphologies of animals and plants.

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

to implement the basic principles of evolutionary biology and rational decision of bees and flowers, in their daily lives in all fields of life (i.e. economic markets or picking a business associate or a spouse).

Attendance requirements(%):

100%

Teaching arrangement and method of instruction: Lecture

Course/Module Content:

Flowers structure and "economic" considerations.

Gender ratio in a species.

Sexual types in flowers and their relationship to pollination. Principles in the bloom market.

Bees - the main pollinators.

Advertisement and reward in the bloom market. Colors of flowers. Co-evolution

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Required Reading:

None

Additional Reading Material:

Textbooks in English:

College Mosby / Mirror Times ,Biology 1986 B G Johnson and H P Raven . $\kappa$   
Publishing.

,Press University Princeton .Allocation Sex of Theory The 1982 .L .E Charnov . $\beth$   
Princeton New Jersey.

Additional reading in Hebrew

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:

None