

## 001-2-3020 The ecology of plant-animal interactions (3 credits)

Prof. Merav Seifan

### Course description and objective:

The diversity of plants' shapes, sizes odors and colors is enormous. Many of these characteristics are directly and indirectly related to strategies for increasing fitness by attracting and rejecting animals. Likewise, many animal groups have adapted their behavior and sensory abilities in accordance with the plants characteristics in order to maximize their own fitness. Due to their key role in many ecosystems, understanding of plant-animal interactions at the various organization levels is central to our understanding of the world in which we live. The objective of the course is to introduce the key interactions between plant and animals: herbivory, pollination and seed dispersal and study how each of them shape both plants and animals from the level of the individual to the ecosystems.

### Course structure:

The course will be taught weekly in the winter semester in 3 hours units that will include also exercises and student seminars

The course is designed for M.Sc. & third year students.

### Assessment of students and structure of final grade:

Exercises	40%
Participation in class and discussion	10%
Final exam	50%

### Detailed description of course units:

13.03.23 **Introduction:** Why are plant-animal interactions important and what lies behind the name.

20.03.23 **Herbivory 1:** The role of herbivores in the trophic system; Strategies of the individual plant against herbivores.

The wild Tobacco system – discussion of a case study.

27.03.23 **Herbivory 2:** The effect of plant-herbivore interaction on population dynamics; Under- and over-compensation in plants.

03.04.23 **Herbivory 3:** Grazing strategies and the shaping of communities in space and time.

Exercise: task distribution and instruction for seminar.

17.04.23 **Herbivory 4:** Ecosystem response to herbivory; Shrub encroachment; Desertification; Combined effects of herbivory and other environmental factors: the cases of the Mediterranean ecosystem and the Savannah.

24.04.23 **Herbivory seminar:** Wild and domestic herbivory – theory and reality

01.05.23 **Pollination 1:** Population biology of sex in plants and its implication for pollination strategies

- 08.05.23 **Pollination 2:** The evolution of flower signals and reward; Maximization of plant's female and male reproductive success using animal vectors.  
Exercise: flower dynamics and the effect of pollinator foraging behavior – computer exercise.
- 15.05.23 **Pollination 3:** Pollinator's behavior and cognition; Pollinator's color sight; Learning abilities in insect pollinators; The development of foraging rules.  
Exercise: task distribution and instruction for seminar
- 22.05.23 **Pollination 4:** Pollination as an ecosystem service; Potential effects of plant-pollination interaction on community structure; The specific case of mimicry;
- 29.05.23 **Pollination seminar:** the pollinator crisis and implications for the modern world
- 05.06.23 **Dispersal 1:** Theories of dispersal in time and space; The evolution of animals as seed dispersers.
- 12.06.23 **Dispersal 2:** Visual communication between plants and animal for seed dispersal; Fleshy fruits; seed shapes.
- 19.06.23 **"Mirror world":** plant eating animals, mimicry between animal and plants. The evolution of carnivorous plants and their signaling method; sexual mimicry in plants;