

# Evolutionary Ecology

001-2-3084

4 academic credits

The course is designed for graduate students with basic background in ecology and evolution.

## **Course description:**

Evolutionary biology and ecology both share the goals of describing variation in natural systems and discovering its functional basis. While the former emphasizes historical and lineage-dependent processes, the latter focuses on contemporary effects of biotic and abiotic environmental factors. Evolutionary ecology incorporates these two approaches into a single discipline, encompassing a wide range of scales and techniques at which ecological adaptation is studied.

This course starts with a brief introduction to basic concepts and hypotheses in evolutionary ecology, and the theoretical and empirical tools used to explore it. Following, we discuss specific topics, including variations in life histories and behavioral traits, and coevolutionary processes. Finally, we discuss human evolutionary ecology. The course includes discussions of conceptual aspects and hands-on numerical exercises of key phenomena and tools.

The course is based on the book: *Evolutionary Ecology: Concepts and Case Studies*, 2001, edited by Charles W. Fox, Derek A. Roff and Daphne J. Fairbairn. Oxford University Press and additional research papers.

## **Course structure:**

The course will be conducted as 4-hour weekly meetings in one semester.

## **Course topics:**

1. Introduction, sources of variation, tradeoffs
2. Selection and adaptation
3. Timing and size at maturation
4. Number and size of offspring
5. Lifespan and aging
6. Sex and sex ratios
7. Mating systems and parental care
8. Cooperation and sociality
9. Foraging and movement
10. Predator-prey coevolution
11. Parasite-host coevolution
12. Mutualism
13. Human evolutionary ecology

## **Grade components:**

Attendance and participation in class discussions	10%
Exercises	20%
Presentation of a selected topic	30%
Home exam	40%