Faculty of Science

BIOR35, Biology: Evolutionary Animal Ecology, 15 credits

Biologi: Evolutionär zooekologi, 15 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2007-03-01 to be valid from 2007-07-01, autumn semester 2007.

General Information

The course is an optional second-cycle course for a degree of Bachelor or Master of Science in Biology.

Language of instruction: English and Swedish
If needed, the course is taught in English.

Main field of studies	*Depth of study relative to the degree requirements*
Biology	A1F, Second cycle, has second-cycle course/s as entry requirements

Learning outcomes

The general aim of the course is that students, on completion of the course, shall have developed an evolutionary thinking to be applied when planning projects and when analysing their own and others' research results in animal ecology. They shall also have acquired considerable specialised knowledge in evolutionary ecology and in empirical and theoretical methodology. The course shall prepare the students for postgraduate studies and for professions that require an understanding of formulation and analysis of ecological problems.
On completion of the course the student shall be able to:

- understand evolutionary thinking and a scientific approach, i.e. from an evolutionary perspective be able to analyse ecological problems and studies critically, formulate own hypotheses and predictions, and design simple experiments/studies to test them as well as interpret and present data
- understand the basics of the evolutionary theory and its importance when studying patterns and processes in nature

- account for modern theories in evolutionary ecology and have knowledge about the research front in this area
- collect and critically evaluate scientific information in evolutionary ecology
- have considerable training in oral and written presentation as well as information retrieval.

Course content

The central topic of the course is evolutionary theory and its ecological applications. The course focuses on processes at both gene- and individual level with an emphasis on animals. The course is divided into different parts based on subject content:

- Evolutionary Ecology: The course starts with the basics of Darwin's theory about evolution. Thereafter, central concepts such as natural and sexual selection, fitness, proximate and ultimate explanations, and speciation are discussed. Important general analytical methods to study evolutionary processes are also discussed, such as quantitative genetics, optimality- and game theory as well as comparative and allometric methods.
- Ecophysiology and migration: This section highlights the importance of organism's physiological and morphological adaptations and limitations, both at ecological and evolutionary time scales. Topics that are covered include energy metabolism, migration, locomotion, orientation and navigation, and morphological adaptations.
- Life history strategies: This section focuses on questions about when, where, and how organisms optimally carry out different parts of their life-cycle, especially reproduction. It covers demography, reaction norms, phenotypic plasticity, hormones, sex allocation, aging, cost of reproduction and relevant trade-offs, as well as immune defence, parasites and diseases.
- Mating systems and sexual selection: The section deals with social mating systems, extra-pair copulations, the evolutionary consequences of conflicts between the sexes and parent-offspring, as well as theories of sexual selection and mate choice.
- Coevolutionary processes and signals: In this section, coevolutionary processes within and between species are discussed, e.g. communication between individuals (pheromone communication in insects and bird song), predator-prey interactions, parasite-host interactions, and mimicry,
- Scientific methodology: This is partly integrated in the other parts of the course. Other specific parts include e.g. scientific methodology, the literature project (review of articles that are carried out individually), a part about experimental design, and short practical projects that include experimental design, implementation, and a conference with an oral presentation of the project.

Course design

The teaching consists of lectures, field exercise, seminars (on book chapters and research papers), group work, own literature project and conference. Participation in field exercise, seminars, group work, presentation of literature project, conference as well as associated parts, is compulsory.

Assessment

The examination takes place in the form of a written examination after about seven weeks, a written presentation of the literature project, as well as through an oral presentation of an own study design at the conference at the end of the course. For students who have not passed the regular examination, an additional examination in close connection to the end of the course is offered.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.
To pass the entire course, approved examination, approved literature project, approved presentation at the conference, as well as approved compulsory parts, are required.
The final grade is decided through a weighing of the results of the parts that are included in the examination: written examination (80%), written literature project (16%), oral presentation of project at conference (4%).

Entry requirements

For admission to the course, English B and 105 credits of scientific studies including knowledge corresponding to BIO580 Ecology basic course 15 credits, and BIO611 Ecology 15 credits alternatively BIO621 Limnology 15 credits and BIO782 Aquatic Ecology 15 credits, is required.

Further information

The course may not be included in a degree together with BIO794 Evolutionary Animal Ecology 15 credits.

Subcourses in BIOR35, Biology: Evolutionary Animal Ecology

Applies from H13

0711 Theory, 12,0 hp
Grading scale: Fail, Pass, Pass with distinction
0712 Exercises and Assignments, 3,0 hp
Grading scale: Fail, Pass, Pass with distinction

Applies from H07

0701 Evolutionary Animal Ecology, 15,0 hp
Grading scale: Fail, Pass, Pass with distinction