



DEPARTMENT OF BIOLOGICAL AND ENVIRONMENTAL SCIENCES

BIO418 Conservation and the genetics of populations, 15 credits

Bevarandebiologi och populationsgenetik, 15 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Biological and Environmental Sciences on 2015-04-01 and was last revised on 2021-11-23 to be valid from 2021-11-23, autumn semester of 2021.

Field of education: Science 100%

Department: Department of Biological and Environmental Sciences

Other participating department

Department of Marine Sciences

Position in the educational system

This is a course in biology at the advanced level. The course can be part of the master programs in biology, molecular biology, marine sciences, and environmental sciences. The course is also offered as a separate course.

The course can be part of the following programmes: 1) Marine Science, Master's Programme (N2MAV) and 2) Biology, Master's Programme (N2BIO)

Main field of studies

Marine Sciences

Molecular Biology

Environmental Science

Biology

Specialization

A1N, Second cycle, has only first-cycle course/s as entry requirements

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Entry requirements

Alternative 1: Completed basic courses in biology comprising 60 credits in the subject areas of cell biology, molecular genetics, evolution, botanical and zoological physiology, ecology, biodiversity and systematics, or equivalent.

Alternative 2: 90 credits approved of 120 credits on courses within the first two years of the Bachelor program in marine sciences, University of Gothenburg, or equivalent.

Alternative 3: Completed courses in the first year of the Bachelors in science in Environmental science program and an additional 15 hp basic level course in biology, or equivalent.

In addition to any of the three alternatives above, at least one approved in-depth course (15 credits) in a relevant area in biology at the Bachelor level and English 6/English B or equivalent, is required.

Learning outcomes

The overall goal of the course is to provide in-depth knowledge in population genetics and modern DNA technology for working with nature conservation and conservation biology in government, business and research.

On successful completion of the course the student will be able to:

Knowledge and understanding

- account for how intra-specific biodiversity is generated
- describe the importance of intra-specific biodiversity for ecosystem functioning and ecosystem services
- analyze population genetic processes and describe how population genetics can be applied within conservation biology, nature conservation and management of natural resources

Competence and skills

- handle, statistically analyze and draw conclusions from large population genetic and genomic data sets
- plan and execute population genetic surveys and experiments

Judgement and approach

- critically evaluate scientific literature and population genetic studies
- identify limitations of genetic methods in conservation and management

The course is sustainability-related, which means that at least one of the learning outcomes clearly shows that the course content meets at least one of the University of Gothenburg's confirmed sustainability criteria.

Course content

The course is divided in two parts. The first part covers population genetic theory and the mechanisms of evolutionary change, basic statistics, as well as practicals using population genetic and genomic data and software in the R environment, followed by an examination after two and half weeks.

The second, larger part deals with the application of genetics in conservation and a group mini-project, where you analyze and present genomic data. The course ends with a final examination.

The course covers the following topics:

- Inbreeding, demography and hybridization
- Conservation breeding, assisted evolution and restoration
- Meta-populations and fragmentation
- Exploited populations and units of conservation
- Genetic identification and monitoring
- Invasive species and climate change

Form of teaching

The course consists of lectures, literature seminars, computer exercises and project work. Project work is an essential part of the course.

Language of instruction: English

Assessment

Mandatory parts (according to the course schedule): computer exercises, literature seminars, written reports and oral presentations (4 credits). The first part of the course is examined by a written exam (4 credits), and the second part by written exam (7 credits).

If a student, who has failed the same examined component twice, wishes to change examiner before the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance).

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U). For the grade Pass 60% of the written exam is usually required, as well as approved written reports and oral presentations. For the grade Pass with Distinction 85% of the written exam is usually required together with approved written reports and oral presentations.

Course evaluation

Opportunity to submit a written course evaluation is usually given at the end of the course. A summary of the results is presented on the Canvas page for the course, as well as to the participants of the next course.