Faculty of Science

BIOR92, Biology: Genetic Analysis, 7.5 credits
Biologi: Genetisk analys, 7,5 högskolepoäng
Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2021-09-09 to be valid from 2021-09-09, spring semester 2023.

General Information

The course is an elective second cycle component of a Bachelor of Science degree in Biology or Molecular Biology and a Master of Science degree in Biology, Molecular Biology or Bioinformatics.

Language of instruction: English

Main field of studies	Depth of study relative to the degree requirements
Molecular Biology	A1N, Second cycle, has only first-cycle course/s as entry requirements
Biology	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The general aim of the course is that students on completion of the course should have developed a population genetic way of thinking and use this to plan and perform genetic analyses, including analyses of results from population genetics research.

Knowledge and understanding
On completion of the course the student shall be able to:

- explain the dynamics of the inheritance process from cell- to population level
- account for some of the practical applications of genetics
- describe different working methods within genetics

- account for basic population genetics principles
- explain basic genetic calculations and models
- give an account of the biological data that genetic analyses are based on

Competence and skills
On completion of the course the student shall be able to:

- present result of genetic analyses orally and in writing
- identify and formulate genetic problems
- compile and apply working methods within genetics
- carry out analyses of inheritance
- analyse basic problems within population genetics

Judgement and approach
On completion of the course the student shall be able to:

- critically review and analyse different population genetics methods
- evaluate results of genetic analyses
- from a scientific perspective discuss/argue for the use of different genetic analyses
- make relevant ethical and societal assessments of genetic methods

Course content

Central for the course is population genetic theory and its applications. The course focuses on the gene, family and population level. The course consists of different components including inheritance analyses of cross breeding and pedigree-data, use and properties of genetic markers and sequence data, non-Mendellian inheritance and epigenetic phenomena, basic linkage analyses and mapping, quantitative genetics and analysis of complex properties, classical population genetics and evolution of genetic and reproductive systems. Basic mathematical computing models will be used and discussed. Applications in medical genetics, plant breeding and evolution will be highlighted and discussed.

Course design

Teaching consists of lectures, multi-medial material, computation exercises, computer exercises, group work, written assignments, seminars, project work, literature project and presentation. Compulsory participation is required in exercises, written assignments, project work and associated elements.

Assessment

The assessment is based on the written examination at the end of the course, written assignments during the course and through compulsory components. Students who do not pass an assessment will be offered another opportunity for assessment soon thereafter.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

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.
For a grade of Pass on the whole course, the student must have passed the written examination, the written assignments and compulsory components. The grading scale for written examination is Fail, Pass and Pass with distinction, while the grading scale for written assignments and compulsory components is Fail and Pass. The final grade is determined by the aggregated results of the written examination and written assignments.

Entry requirements

To be admitted to the course, students must have 90 credits scientific studies including knowledge equivalent to BIOA10 Cell and microbiology, 15 credits and BIOA11 Genetics and evolution. English 6/English B.

Further information

The course may not be included in a degree together with BIOR59 Genetic analysis 1 (7.5 credits), or BIOR60 Genetic analysis 2 (7.5 credits).

Subcourses in BIOR92, Biology: Genetic Analysis

Applies from V23

2301   Hand ins and compulsory components, 1,5 hp
           Grading scale: Fail, Pass
2302   Written examination, 6,0 hp
           Grading scale: Fail, Pass, Pass with distinction