

Syllabus for Plant Evolution and Diversity 15 ECTS credits

1. Course details

Approved by the Education Committee of the Faculty of Science 01-03-2007. The syllabus is valid from 01-07-2007. The course is at the Second cycle.

2. General information

The course is part of the main field of study in Biology at the Faculty of Science. The course is optional in a Bachelor's or Master's degree in Science, major in Biology. The course is also offered as a single subject course. The language of instruction is English if necessary.

3. Learning outcomes

On completion of the course, the students shall have acquired the following knowledge and understanding:

- be able to explain the underlying evolutionary mechanisms of diversity and speciation in the plant kingdom
- be able to describe the variety of pollination syndromes, reproductive systems and population structures seen in the plant kingdom, and explain the mechanisms underlying this diversity
- be able to explain and critically analyse how the genetic diversity and evolutionary potential of plant populations are influenced by phenomena like phenotypic plasticity, seed banks, clonality, hybridization, polyploidy and postglacial colonization history
- be able to formulate hypotheses and propose methods when studying evolutionary phenomena in wild plant species
- be able to analyse the dynamics of plant populations using demographic data.
- be able to apply knowledge of genetic and evolutionary phenomena and population dynamics in conservation biology
- be able to critically analyse literature- and internet-based information to evaluate various hypotheses in the subject area
- be able to communicate knowledge of evolutionary phenomena and population dynamics to people outside the subject area

4. Course contents

- Evolutionary processes and plant population structures. Phenotypic plasticity and local adaptation. Ecotypes.
- Postglacial colonization history of plants in northern Europe. Genetic and biogeographic consequences. Phylogeography.
- Allopatric and sympatric speciation in the plant kingdom. Speciation through hybridization and chromosomal changes. Species concepts.
- Pollination and reproductive biology. Plant mating systems. Reproductive costs and strategies in the plant kingdom. Selective processes associated with fertilization and seed development.
- Population dynamics and demography of plant populations. Population models. Clonality, seed banks and life histories.
- Biodiversity and conservation biology of plants. Consequences of differentiation, hybridization and different species concepts for the conservation value and long-term maintenance of plant diversity.

- Methodology and field studies. These parts will be an integrated part of all course subjects, but will also comprise specific topics such as computer-based shape description and the construction of phylogenetic trees based on molecular and phenotypic data.

5. Teaching and assessment

Teaching consists of lectures, practicals, group exercises, seminars and project work. Participation in practicals, group exercises, seminars and project work, and the course elements associated with these are compulsory.

Examination takes the form of written tests during the course.

Students who fail the ordinary tests will have an opportunity to take another test in close proximity to the ordinary test.

6. Grades

Students are awarded one of the following levels Distinction, Pass or Fail. To be awarded a Pass on the whole course the student shall have passed the tests, have acceptable hand-in exercises, have acceptable project reports and to have participated in all compulsory course elements.

The final grade for the course is determined by the aggregated results of the different parts of the examination.

7. Admission requirements

To be eligible for the course requires: 90 ECTS credits natural science studies including courses corresponding to MOB101 Cell Biology 15 ECTS credits, BIO006 Genetics, Microbiology 15 ECTS credits, BIO580 Basic Ecology 15 ECTS credits, BIO503 Botany 12 ECTS credits and at least 3 ECTS credits in Floristics.

8. Literature

According to a list established by the department, available at least five weeks before the start of the course, see the web page for Undergraduate Studies in Biology, <http://www.lu.se/biology-education>

9. Further information

The course cannot be credited as part of a degree along with BIO647 Plant Evolution and Diversity 10 credits.