Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Syllabus

BI0979.1 Biology and Biotechnology in Forest Production Systems, 15.0 credits

Biologi och bioteknik för skogliga produktionssystem

The course is given as course independent of study programme

Syllabus discontinued 16 March 2011

Version 1 in Slukurs. Corresponds to version 1 in Ladok

Syllabus approved

2 June 2008

The version applies to students admitted from spring 2008 to spring 2010

The version is not a module version

Subjects

Biology

Education cycle

Second cycle

Modules

Title	Code	Credits
Single module	0101	15.0

Advanced study in the main field

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

Grading scale

5:Pass with Distinction, 4:Pass with Credit, 3:Pass, U:Fail
The requirements for attaining different grades are described in the course assessment criteria which are contained in a supplement to the course syllabus. Current information on assessment criteria shall be made available at the start of the course.

Language

English

Prior knowledge

Knowledge equivalent to English B from upper secondary school is required as from the academic year 2009/10.
BSc degree in Biology with 60 ECTS in Biology including 7.5 ECTS in Cell biology and 15 ECTS Chemistry, or the equivalent.

Objectives

After the course the student will
• have knowledge of advanced theory concerning the biology underlying the optimal production of forest biomass and optimal wood and fiber properties
• have advanced knowledge of the theory of forest biotechnology, the scope for its use within forest production systems, wood properties and uses of the raw material
• have knowledge of experimental technology used in production research and wood and fiber analyses
• be able to independently perform, summarize and present experiments
• be able to understand, evaluate and discuss novel discoveries from reading scientific papers
• be able to synthesize knowledge within a research area, and transmit this knowledge in an oral presentation

Content

The course includes theory, laboratory exercises and project work and literature studies. It starts with an overview of current concepts and issues in tree biotechnology and the industry perspective. Forest biotechnology is presented as a tool to increase raw material production and promote desirable wood and fiber properties for traditional and novel wood products. The course highlights several important

processes in forest production systems such as clonal propagation, growth optimization in plantation forestry, and biosynthesis of wood. The topics include:
1. Tree domestication, gene discovery programs and marker assisted selection
2. Transgenic trees and clonal forestry, environmental and societal issues
3. Wood as product amenable to tree biotechnology manipulation:
i. Genetic and environmental impacts on wood structure and chemistry
ii. Wood formation: cellular events and molecular regulation
iii. Ways of studying wood properties
iv. Wood cell wall biosynthesis
4. Clonal propagation of superior genotypes:
i. In vitro propagation and adventitious rooting
ii. Somatic embryogenesis in conifers and hardwoods
iii. Transgenic tree production
5. Plantation Forestry:
i. Environmental constrains for forest production
ii. Plantation growth modeling
iii. Clonal forestry

Implementation

Timetabled activities:
Lectures ca. 70 hrs
Laboratory experiments and project work ca. 80 hrs (compulsory)
Student seminars ca. 10 hrs (compulsory)
Literature discussions ca. 15 hrs (compulsory)
Workshops ca. 30 hrs
Examination ca. 5 hrs
Non-timetabled group activities:
Writing reports ca. 60 hrs
Exercises ca. 20 hrs
Self-directed studies:
Literature studies ca. 90 hrs
Seminar preparation ca. 20 hrs
Total ca. 400 hrs

Formats and requirements for examination

Assessment is based on performance in the written examination, written review and presentation of the laboratory work and seminar.

Requirements to pass
Successful completion of the course requires: a pass in the examination, satisfactory appraisals of the review, report and presentations and participation in compulsory activities.

- If the student fails a test, the examiner may give the student a supplementary assignment, provided this is possible and there is reason to do so.
- If the student has been granted special educational support because of a disability, the examiner has the right to offer the student an adapted test, or provide an alternative assessment.
- If changes are made to this course syllabus, or if the course is closed, SLU shall decide on transitional rules for examination of students admitted under this syllabus but who have not yet passed the course.
- For the examination of a degree project (independent project), the examiner may also allow the student to add supplemental information after the deadline. For more information on this, please refer to the regulations for education at Bachelor's and Master's level.

Additional information

On request, exchange students will be graded according to the ECTS scale.

- The right to take part in teaching and/or supervision only applies to the course date to which the student has been admitted and registered on.
- If there are special reasons, the student may take part in course components that require compulsory attendance at a later date. For more information on this, please refer to the regulations for education at Bachelor's and Master's level.

Responsible department

Department of Forest Genetics and Plant Physiology

Supplementary Information

Finalized by: Programkommitté skog och mark
Biology Area: Botany
Replacement course: BI0653