Swedish University of Agricultural Sciences

P000040, Wood Biology and Biotechnology, 5.0 Hp

Syllabus

Finalized by: Finalized by: Ann-Katrin Israelsson, 2023-04-05, 2023-04-05

Level within study regulation:

Third cycle

Subject:

- Biology

Grading scale:

Pass / Failed

Course language:

Swedish

Entry requirements:

The knowledge of biology and biochemistry or microbiology at the bachelor level is required, for example, 60 ECTS in Biology including 7.5 ECTS in Cell biology and 15 ECTS Chemistry, or the equivalent.

Objectives:

After completing the course, the student should be able to:

- describe how the wood tissue is formed
- describe/discuss the basic wood chemical composition and cell wall organization

- describe/explain the principles of molecular and hormonal regulation of wood formation
- describe the principles of biosynthesis of the main cell wall components of wood, and their functions
- design an outline of a research program for functional studies of genes involved in wood formation
- identify different anatomical features of wood
- use bioinformatics resources for wood formation studies.
- evaluate feasibility of different biotechnological manipulations of wood for different end-uses
- suggest approaches to reach the biotechnological goal

Content:

The main objectives are to familiarize the students with the biological process of wood formation, generation of variability in wood and selected contemporary approaches for studying wood biology. This knowledge is prerequisite for developing wood biotechnology aspects in the future by the students. Current status of wood biotechnology will be presented.

The course topics include wood organization, structure, chemistry and mechanics in conifers and hardwoods, from the molecular level to the tissue organization level, followed by an update on molecular, genetic and physiological aspects of wood cell differentiation and cell wall formation. Practical tools for wood analysis and wood biology studies, including traditional and advanced microscopy, atomic force microscopy, microfluidics, and wet chemistry methods will be demonstrated and hands-on experience with bioinformatics tools available for trees will be included.

Modes of assessment:

For the full 5 ECTS credits, the students are required to participate in all course activities including social activities, poster presentation, and discussions, as well as complete and obtain an approval of a written assignment *within 3 weeks after the course*. The written assignment will be a short review or a short project proposal within the topic of wood biology and biotechnology, reviewing min. 15 original research papers. - If a student has failed an examination, the examiner has the right to issue supplementary assignments. This applies if it is possible and there are grounds to do so.

- The examiner can provide an adapted assessment to students entitled to study support for students with disabilities following a decision by the university. Examiners may

also issue an adapted examination or provide an alternative way for the students to take the exam.

- If this syllabus is withdrawn, SLU may introduce transitional provisions for examining students admitted based on this syllabus and who have not yet passed the course.
- For the assessment of an independent project (degree project), the examiner may also allow a student to add supplemental information after the deadline for submission. Read more in the Education Planning and Administration Handbook.

Organisation:

Department of Forest Genetics and Plant Physiology

Supplementary information

Other information:

- The right to participate in teaching and/or supervision only applies for the course instance the student was admitted to and registered on.
- If there are special reasons, students are entitled to participate in components with compulsory attendance when the course is given again. Read more in the Education Planning and Administration Handbook.