



BB2330 Plant Biotechnology 7.5 credits

Växtbioteknik

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for BB2330 valid from Spring 2017

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Biotechnology

Specific prerequisites

Admission requirements for programme students at KTH:

At least 150 credits from grades 1, 2 and 3 of which at least 100 credits from years 1 and 2, and bachelor's work must be completed. The 150 credits should include a minimum of 20 university credits (hp) in biochemistry, microbiology and gene technology/molecular biology. 20 university credits (hp) chemistry including courses in Chemical Measuring Techniques and , as well as 20 university credits (hp) in mathematics and computer science or corresponding.

Admission requirements for independent students:

A total of 20 university credits (hp) in biochemistry, microbiology and gene technology/molecular biology. 30 university credits (hp) chemistry possibly including courses in Chemical Measuring Techniques, as well as 20 university credits (hp) in Mathematics and computer science, 5 credits of these must be within the fields of Numerical Analysis and Computer Sciences. Documented proficiency in English corresponding to English B.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The course will provide an overview of plant biotechnology with focus on industrial applications. The course will even provide basic knowledge in plant biology, plant molecular biology and plant biochemistry.

Upon completion of the course, the student will be able to:

- describe the plant cell, its characteristic organelles as well as the composition, structure and properties of the plant cell wall,
- describe mechanisms of plant cell signaling and gene regulation,
- describe the function of plant hormones and their molecular mechanisms,
- describe plant metabolic pathways such as carbohydrate and fatty acids
- describe different methods for transformation of plants or plant cells, including their specific advantages and applications,
- give examples of, and describe, plant biotech applications within forestry, agriculture, and production of new materials, pharmaceuticals and bio-fuels,
- describe current regulations regarding production and use of GMOs in Sweden and the world
- define the terms transcriptomics, proteomics, interactomics, metabolomics and systems biology, and describe their importance in plant biotechnology research,
- describe alternative plant biotechnology methods that can replace genetic modification
- research an application of plant or forestry biotechnology and present the results in a well-structured oral presentation as well as in written form
- present and discuss a laboratory experiment in written form

Course contents

The course comprises introductory plant biology followed by plant biotechnology. Selected topics include Plant anatomy, development and life cycle, Plant cell and plant cell wall, Plant cell signaling and gene regulation, Plant hormones, Plant carbohydrate and lipid metabolism, Plant tissue culture, Transformation of plants or plant cells, Stress, pathogen and herbicide tolerance, Improved nutritional content and functional foods, Phytoremediation, Forest biotechnology, Plants as green factories: production of plastics, fats/oils, fibers, proteins and biofuels, GMO-regulations

Course literature

Plant Biotechnology: The Genetic Manipulation Of Plants, by Adrian Slater, Nigel Scott and Mark Fowler, 2nd Edition, 2008, Oxford University Press

Examination

- LAB1 - Laboratory Work, 1.5 credits, grading scale: P, F
- LIT1 - Literature Task, 1.5 credits, grading scale: P, F
- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Other requirements for final grade

Examination (TEN1; 4.5 credits, grading scale A-F), participation in laboratory work (LAB1; 1,5 credits, grading scale Pass/Fail) and literature assignment with written report and oral presentation (LIT1; 1.5 credits, grading scale Pass/Fail)

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.