



BB1190 Gene Technology 7.5 credits

Genteknik

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

Establishment

Director of undergraduate studies, Torbjörn Gräslund, School of CBH, Date of decision 2025-10-16

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Intended learning outcomes

After completion of the course the student shall have Knowledge and understanding to:

- Describe the processes and steps necessary to synthesize DNA molecules different sizes

- Construct and optimize genetic regulons with the purpose of achieving a specific expression pattern.
- Apply gene technology for the development of new antibodies and vaccines.
- Select methods for DNA mutagenesis and identify DNA mutations with help of DNA sequencings.
- Compare different types of gene therapy based on their strengths and weaknesses.
- Identify areas where gene technology can contribute to environmental sustainability.
- Create experimental workflows based on gene technology concepts to address common problems in biotechnology.

Skills and abilities to

- Present and evaluate laboratory work in the form of a writtent report.

Course contents

This course begins the transition from molecular biology and genetics to gene technology. Starting from a basis in biochemistry and microbiology, students will learn methods for constructing DNA for a particular purpose, such as controlled expression of a gene. Students will learn how to formulate gene expression mathematically. Students will also learn various application areas of gene technology, such as in diagnostics, in drug development, in medicine, and in sustainability.

Course content includes:

- transcription - and translational gene regulation
- recombinant DNA (enzymes, vectors, host cells)
- PCR techniques
- DNA-sequencing
- synthetic biology
- mutagenesis, genetic libraries
- therapeutic strategies (vaccines, gene therapy, antibodies)
- DNA-based diagnostics
- gene editing in medicine
- gene technology in sustainable bioproduction
- a lab course where many of the technologies are tested practically; among others a strategic mutagenesis will be carried out with subsequent identification, sequence verification, and of categorization of relevant the clone

Examination

- TEN1 - Written exam, 6.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboration, 1.5 credits, grading scale: P, 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.

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

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.