

*Course syllabus*

# Genteknik Gene Technology

**KBKF01, 7,5 credits, G2 (First Cycle)**

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED B/K

**Date of Decision:** 2023-04-18

## General Information

**Main field:** Technology.

**Main field:** Biotechnology.

**Compulsory for:** B3

**Language of instruction:** The course will be given in English

## Aim

The aim of the course is to give the student the ability to understand and critically examine gene technologies.

## Learning outcomes

### *Knowledge and understanding*

For a passing grade the student must

- be able to describe and formulate a simpler gene cloning experiment
- be able to describe, formulate and evaluate different host cells for expression of a foreign protein
- be able to describe applications of gene technology in biotechnology, food technology and medicine.

### *Competences and skills*

For a passing grade the student must

- practically be able to explore the most commonly used techniques in the laboratory.
- be able to follow changes caused by a gene modification.
- be able to describe and evaluate information in scientific articles in gene technology.

### *Judgement and approach*

For a passing grade the student must

- in a group be able to discuss and critically examine scientific literature.
- both in oral and written forms be able to utilise and govern the most commonly used methods and techniques in gene technology.

## Contents

The course addresses gene modification of bacterial, yeast, plant and animal cells. Applications in chemical, food and pharmaceutical industries are emphasised. The laboratory part of the course includes some of the most frequently used methods in gene technology, e.g. isolation and mapping of DNA, PCR, vector construct, transformation methods, CRISPR/Cas9, reporter gene (GFP) and flow cytometry.

## Examination details

**Grading scale:** TH - (U,3,4,5) - (Fail, Three, Four, Five)

**Assessment:** Active participation in practicals, written report, literature task, oral presentation of a literature task and written exam.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

### Parts

**Code:** 0117. **Name:** Gene Technology, Theory.

**Credits:** 6. **Grading scale:** TH. **Assessment:** Oral presentation of a literature task and written exam.

**Contents:** The course deals with the genetic and physiological prerequisites for gene modification of bacterial, yeast, plant and animal cells. Applications in chemical, food and pharmaceutical industries are emphasised.

**Code:** 0217. **Name:** Gene Technology, Practical.

**Credits:** 1,5. **Grading scale:** UG. **Assessment:** Active participation in practicals and written report.

**Contents:** The laboratory part of the course includes some of the most frequently used methods in gene technology, e.g. isolation and mapping of DNA, PCR, vector construct, transformation methods, CRISPR/Cas9, reporter gene (GFP) and flow cytometry.

## Admission

### Admission requirements:

- KMB060 Microbiology or KMBA01 Microbiology or KMBF05 Food Microbiology

**Assumed prior knowledge:** KBKF15 Biochemistry

**The number of participants is limited to:** No

**The course overlaps following course/s:** KBK041

## Reading list

- course leaders: Laboratory Compendium. Laboratory manual.
- T.A. Brown: Gene Cloning and DNA Analysis, An Introduction. Wiley-Blackwell, 2020, ISBN: 9781119640783.

## Contact and other information

**Course coordinator:** Dr. Catherine Paul, catherine.paul@tmb.lth.se

**Course coordinator:** Dr. Magnus Carlquist, magnus.carlquist@tmb.lth.se

**Examinator:** Lei Ye, lei.ye@tbiokem.lth.se

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**Course homepage:** <http://www.tbiokem.lth.se>

**Further information:** The course is given in collaboration between the divisions of Pure and Applied Biochemistry and Applied Microbiology.