



BB2410 Molecular Biotechnology for Nanotechnology 7.5 credits

Molekylär bioteknik för nanoteknologi

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

Establishment

Course syllabus for BB2410 valid from Autumn 2011

Grading scale

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

Education cycle

Second cycle

Main field of study

Biotechnology

Specific prerequisites

Admittance to a Masters programme at KTH with some basic background in chemistry, physics and biology

Language of instruction

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

Intended learning outcomes

The course aims at presenting the state-of-art in interactions between nanotechnology and biotechnology at the scientific frontier. This course will teach the methods which forms the basis for molecular biotechnology within the range of nanoscience applications

After successful completion of the course, the students should be able to:

- Understand the basic concept in molecular biology
- Capable to define recombinant DNA technology
- Give an example and explain the synthesis of important industrial products
- Explain the potential application of molecular techniques in diagnostics and therapeutics
- Present the result of the laboratory exercise as written report

Course contents

Disposition

Fundamentals in molecular biology; Tools which enable molecular biotechnology; Structure and functional analysis; Enzymes; DNA sequencing; PCR methods; Protein engineering; Principles on gene technique based vaccines; Molecular diagnostics; Biosensors on nano and micro scale.

Lab

Gene amplification by PCR techniques; Transformation of gene in E.coli; selecting the correct transformed colonies.

Protein isolation purification using selective magnetic beads and molecular weight determination

Course literature

Lecture notes and reference literature

Bio-nanotechnology, Goodsell Wiley-Liss, New Jersey, 2004

Molecular Biotechnology – Principles and applications of recombinant DNA, Bernard R. Glick; Jack J. Pasternak, 2003

Examination

- SEM1 - Seminars, 1.5 credits, grading scale: P, F
- TEN1 - Written exam, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 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.

A written examination (TEN1; 3cr) covers the lecture course. To pass the course it is necessary to pass the tutorial and lab exercise (ASS; 1cr, Lab;1cr). Further requirements about the examination and requirements are given at the course start.

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.