BB2370 Nanobiotechnology 6.0 credits

Nanobioteknologi

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

Establishment

Course syllabus for BB2370 valid from Spring 2011

Grading scale

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

Education cycle

Second cycle

Main field of study

Biotechnology

Specific prerequisites

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, as well as 20 university credits (hp) in mathematics and computer science or corresponding. Documented proficiency in English corresponding to English B.

Admission requirements for programme students at KTH:

Language of instruction

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

Intended learning outcomes

This course will increase the student's competence in using technology applications for control of macromolecules processes. Macromolecules can be used in many applications if the nano materials properties of these molecules are understood.

After the successful completion of this course the students will be able to:

- understand the possibilities of using macromolecules in nanotechnology
- understand the possibilities in developing functionalized devices
- understand and explain the potential application of engineered proteins in designing nanopore structures
- application of DNA based structures in mechanics and computing
- understand the basic concept in nanoanalytics
- example on methods for diagnostics and biosensing

Course contents

State of the art in todays biotechnology industry; Interactions and molecular properties in nature compared to the advancement in artificial structures; Biological nano machines; Lab on chip; Future applications of micro and nano devices in biotechnology and medicine

Lab

Electrochemical detection with DNA chip (Bead based sandwich hybridization)

Fluorescent detection of microorganisms-Fluorescent in situ hybridization (FISH)

Magnetic beads for the detection of certain bacteria

Course literature

Lecture notes, selected research articles and review papers will serve as course material

Nanobiotechnology Neimeyer C.M., Mirkin, C.A, Wiley-VCH, 2004

Examination

- INL1 - Assignment, 1.0 credits, grading scale: P, F
- TEN1 - Examination, 4.0 credits, grading scale: A, B, C, D, E, FX, F

- LAB1 - Laboratory Work, 1.0 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.

Other requirements for final grade

A written examination (TEN1; 4 credits, grading scale A-F) covers the lectured course.
To pass the course it is necessary to pass the tutorial and lab exercise (INL1; 1 credit, grading scale A-F, LAB1; 1 credit, grading scale Pass/Fail). 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.