BB2530 Micro and Nanotechnologies for Biotechnology 6.0 credits

Mikro och nanoteknologier inom bioteknologi

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 BB2530 valid from Spring 2015

Grading scale

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

Education cycle

Second cycle

Main field of study

Biotechnology

Specific prerequisites

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 credits within the fields of Mathematics, Numerical Analysis and Computer Sciences, 5 of these must be within the fields of Numerical Analysis and Computer Sciences, 20 credits of

Chemistry, possibly including courses in Chemical Measuring Techniques and 20 credits of Biotechnology or Molecular Biology.

Language of instruction

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

Intended learning outcomes

The aim of this course is to give a broad introduction to the interdisciplinary field of micro- and nanotechnology and will highlight basic concepts of microfluidics with emphasis on "Lab-on-a-chip" systems for biological applications.

After the course, you will be able to:

- describe the concept of "Lab-on-a-chip"
- describe the main microfabrication technologies used to microfabricate microchips and chose the appropriate material and design of micro- and nanostructures for a given biological problem
- explain potential and limits of microfluidics and suggest strategies to handle challenges.
- participate in scientific discussions regarding the usefulness of micro-and nanotechnology for a given biological problem.
- identify possible new application areas for micro-and nanotechnology as well as identify future trends in this field.

Course contents

The course is focused on the use of micro- and nanotechnologies in biotechnology and biomedical research. The lectures will include an introduction to microfluidics and micro-fabrication technology as well as latest developments in application areas such as nucleic acid and cell manipulation using cutting-edge microfluidic technologies. During the course, an opportunity will be given to take part in laboratory exercises and one test exam.

Course literature

The book Introduction to BioMEMS, 2012, by Albert Folch.

Lecture notes, selected research articles and review papers.

Examination

- LAB2 - Laboratory Work, 1.0 credits, grading scale: P, F
- PRO1 - Project, 1.0 credits, grading scale: P, F
- TEN2 - Written exam, 4.0 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.

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.