



BB2400 Bionanoteknologi 7,5 hp

Bionanotechnology

När kurs inte längre ges har student möjlighet att examineras under ytterligare två läsår.

Fastställande

Kursplan för BB2400 gäller från och med VT19

Betygsskala

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

Utbildningsnivå

Avancerad nivå

Huvudområden

Bioteknik

Särskild behörighet

Undervisningsspråk

Undervisningsspråk anges i kurstillfällesinformationen i kurs- och programkatalogen.

Lärandemål

This course will provide the basic elements of the interface concepts between biology and nanotechnology. The course will focus on the living systems at the nano and micro level as well as the role of genes, proteins and other macromolecules as the building elements of nano structured devices.

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

- Understand the basic concept in cell biology and cell organelles
- Capable to define biological macromolecules
- Understand the basic concept in molecular recognition
- Give an example and explain the function and potential application of protein based structures
- Give an example and explain the function and application of DNA based nanostructures
- Present the result of the laboratory exercise as written report

Kursinnehåll

The molecular machinery of the cell, as well as the physico-chemical interactions between the cells characterizes the living systems. Understanding the assembly of the cell opens some exciting possibilities to construct artificial structures in applied nanotechnology, which will mimic the functions of the biological systems.

A major challenge is to exploit the structures and processes of biomolecules at the cellular and organ-specific levels in order to design novel functional materials, biosensors and bioelectronic components.

Lab

Basic sterilization techniques; delivery of molecules/nanoparticles by endocytosis; identification of pathogenic organisms by magnetic nanoparticles-based techniques.

Kurslitteratur

Essential cell biology, Alberts et al. Garland Science, New York 2004

Nanobiotechnology, concepts, applications and perspectives, C.M. Niemeyer & C.A. Mirkin, 2004

Examination

- LAB1 - Laboration, 1,5 hp, betygsskala: P, F
- SEM1 - Seminarium, 1,5 hp, betygsskala: P, F
- TEN1 - Skriftlig tentamen, 4,5 hp, betygsskala: A, B, C, D, E, FX, F

Examinator beslutar, baserat på rekommendation från KTH:s handläggare av stöd till studenter med funktionsnedsättning, om eventuell anpassad examination för studenter med dokumenterad, varaktig funktionsnedsättning.

Examinator får medge annan examinationsform vid omexamination av enstaka studenter.

A written examination (TEN1; 3cr) covers the lectured 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.

Etiskt förhållningssätt

- Vid grupparbete har alla i gruppen ansvar för gruppens arbete.
- Vid examination ska varje student ärligt redovisa hjälp som erhållits och källor som använts.
- Vid muntlig examination ska varje student kunna redogöra för hela uppgiften och hela lösningen.