SK2533 Experimental Biophysics 7.5 credits

Experimentell biofysik

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

The course syllabus is valid from Spring 2022 according to the school principal's decision: S-2022-0529 Decision date: 2022-02-24

Grading scale

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

Education cycle

Second cycle

Main field of study

Engineering Physics

Specific prerequisites

Completed degree project at the undergraduate level in engineering physics or medical technology.

English B / English 6

Language of instruction

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

Intended learning outcomes

The course provides good knowledge of the most important experimental methods in biophysics, their strengths and weaknesses, and how they are used in the field of biomedicine. The course is adapted for students with a background in engineering subjects.

After completing the course, students should be able to:

- explain the principles of the main methods used in experimental biophysics.
- compare strengths and weaknesses between these methods, and analyze and identify which methods are best suited to study different biomolecular properties or interactions, at the molecular, cellular, tissue or organism level.
- explain and be able to evaluate the application potential of current development trends of these methods.

Course contents

Interaction between biomolecules and electromagnetic radiation. Principles of the most important methods of experimental biophysics, including IR, fluorescence, nuclear magnetic resonance, electron magnetic resonance, circular dichroism, and Raman spectroscopy, mass spectrometry, X-ray crystallography, electron microscopy, surface plasmon resonance, nuclear force microscopy, how these methods can be used to obtain information on different biomolecular properties and interactions, as well as their relative strengths and weaknesses. Overview of current development trends of these methods, as well as applications in academic research, pharmaceutical and biotechnology industries, and in healthcare.

Examination

- LAB1 - Laboratory work, 1.5 credits, grading scale: P, F
- PRO1 - Project, 1.0 credits, grading scale: P, F
- TEN1 - Written exam, 5.0 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.