# SK2520 Experimental Methods in Molecular Biophysics 8.0 credits

## Experimentella metoder inom molekylär 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 Head of School at the SCI School has decided on April 15, 15, to adopt this syllabus to apply from HT2020, diary number: S-2020-0283.

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Biotechnology,Engineering Physics,Physics

## Specific prerequisites

Achieved BSc on any of the programs CMATD, CDATE, CELTE, CTFYS, CMAST, CFATE, or approved courses in mathematics and physics, corresponding to at least the courses in these subjects given on the above programs in the first three years.

Recommended previous knowledge:
Fundamental knowledge in quantum mechanics and optics advantageous, but not absolutely required.

## Language of instruction

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

## Intended learning outcomes

After completing the course the student should be able to:

- explain the principles of the most important methods used in experimental molecular biophysics.
- compare strengths and weaknesses between these methods, and analyze and identify which methods are best suited for studying 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

Basic properties and structure of biomolecules. Basic thermodynamicsabout biomolecules, their dynamics and interactions. Interaction between biomolecules and electromagnetic radiation. The principles of the most important methods in experimental molecular biophysics, how they can be used to obtain information on various biomolecular characteristics and interactions, as well as their relative strengths and weaknesses. E.g. IR, fluorescence, nuclear spin resonance, electron spin resonance, circular dichroism, and Raman spectroscopy, mass spectrometry, X-ray crystallography, electron microscopy, surface plasmon resonance, atomic force microscopy, calorimetry. Overview of current development trends of these methods, as well as applications of them in academic research, pharmaceutical and biotechnology industry, and within healthcare.

## Examination

- LAB1 - Laboratory Work, 2.0 credits, grading scale: P, F
- PRO1 - Project, 1.0 credits, grading scale: P, F
- TEN1 - Examination, 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.

One written examination (TEN1, 5hp, grades A-F), one oral project presentation (PRO1; 1hp, grades P/F), laborations, exercises and study visit (LAB1; 2hp, grades P/F)

## 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.