

Biological Measurements

Programme course

6 credits

Biomätteknik

TFKE37

Valid from: 2017 Spring semester

Determined by

Board of Studies for Chemistry, Biology
and Biotechnology

Date determined

2017-01-25

Main field of study

Biotechnology, Chemical Biology

Course level

First cycle

Advancement level

G2X

Course offered for

- Protein Science, Master's Programme
- Chemical Biology, M Sc in Engineering
- Chemical Biology

Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites

Biokemi 2 (or similar), Physical Chemistry

Intended learning outcomes

The objectives of the course is to provide comprehensive knowledge in the following areas: Measurable properties of biomolecules, light spectroscopy, nuclear magnetic resonance, calorimetry, surface plasmon resonance, fundamental principles for separation based on macromolecular mobility in centrifugal- and electrical force fields as well as direct forces. Furthermore, comprehensive knowledge will be provided regarding applications of these methods within clinical and biomedical analysis, both functional and qualitative. After studies well learned the student will have proficiency to:

- Understand and explain the theory behind the methods that are explained in the course.
- Describe areas of application as well as advantages and limitations with the different methods.
- Analyze, evaluate and draw conclusions from results obtained with the methods treated in the course.
- Propose methods and strategies for studies of specific questions within biochemical and biomedical analysis, and communicate these proposals in novel contexts.
- Investigate laboratory techniques and practice some of the methods treated in the course.

Course content

Different optical methods for the study of biological systems, such as UV, IR, FT-IR, circular dichroism (CD) and fluorescence spectroscopy, calorimetric methods, surface plasmon resonance (SPR), and the fundamental principles for separation by macromolecular mobility in centrifugal and electrical fields, such as electrophoresis, sedimentation analysis and mass spectrometry. The laboratory exercises will include practice or demonstration of a majority of the techniques treated in the lecture course.

Teaching and working methods

Lectures, seminars and laboratory exercises.

Examination

TEN1 Written examination	4.5 credits	U, 3, 4, 5
LAB1 Laboratory work incl. oral presentation of project	1.5 credits	U, G

Grades

Four-grade scale, LiU, U, 3, 4, 5

Department

Institutionen för fysik, kemi och biologi

Director of Studies or equivalent

Magdalena Svensson

Examiner

Maria Sunnerhagen

Education components

Preliminary scheduled hours: 48 h

Recommended self-study hours: 112 h

Course literature

Additional literature

Compendia

Compendium with extracts from reference literature, reviews, scientific articles and lab tutorials. The reference literature is mainly extracted from:

Biophysical Chemistry part II. Cantor & Schimmel, Freeman NY 1980.

Principles of Physical Biochemistry. VanHolde, Johnsson & Ho. Prentice Hall 1998.

Principles and techniques of practical biochemistry. Wilson & Walker, Cambridge University Press 2000.

Protein-Ligand Interactions: hydrodynamics and calorimetry samt Protein-Ligand Interactions: structure and spectroscopy, Harding & Chowdry, Oxford University Press 2001.

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.