Applied Structural Biology

Programme course

6 credits

Tillämpad strukturbiologi

TFKE58

Valid from: 2017 Spring semester

Determined by
Board of Studies for Chemistry, Biology and Biotechnology

Date determined
2017-01-25

Main field of study
Chemical Biology

Course level
Second cycle

Advancement level
A1X

Course offered for
- Protein Science, Master's programme
- 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
Biochemistry 2, Protein Chemistry, and Protein Engineering, Biostructural technologies

Intended learning outcomes
After completing the course, the student should be able to:

- understand current methodological approaches for conducting structural studies on proteins and biomolecules using crystallographic and NMR methodologies,
- apply computer software in general use within the field to generate graphical representations of proteins based on three-dimensional structural data, and use these representations to evaluate structural, biophysical, electrostatical and dynamical properties of proteins
- understand, evaluate, question and apply results from structural biology by critical reading of scientific literature and deposited structure data (in particular the PDB database)
- propose, plan and evaluate research- and development projects where methodology from structural biology is applied

Course content

The lecture part gives in-depth insight in methodologies and approaches regarding structural studies of proteins and biomolecules, and builds on earlier knowledge obtained in the courses Biostructural Technologies and Protein Chemistry. The lecture course as well as application of modern molecular graphics is examined in an individual written examination (UPG1). The remaining part of the course is conducted as three consecutive projects. In the first project (UPG2), articles within key areas in structural biology are distributed to pairs of students by the course leader. The content is presented in an oral presentation using modern molecular graphics to generate illustrations, and in writing as an abstract to the presentation. The oral and written presentation is evaluated in groups. The second project (UPG3) goes deeper into the respective knowledge areas, and the students will here take increased responsibility for choosing the subject and focus in the presentation, which is performed orally in a seminar. The aim of the project is to form the basis for one or more research or development ideas. Selected ideas are then elaborated and presented individually as a Research Proposal in UPG4.

Teaching and working methods

Teaching is organised in lectures, lessons, seminars, and laboratory tasks (mainly molecular computer graphics). A large part of the course is pursued in project groups of 2-3 students, with regular advisory meetings provided.
The course runs over the entire spring semester.

Examination

UPG4	Written report (individual)	1.5 credits	U, G
UPG3	Oral and Written Presentation	1.5 credits	U, G
UPG2	Oral and Written Presentation	1.5 credits	U, G
UPG1	Written assignment (individual)	1.5 credits	U, G

Grades are given as ’Pass’ or ’Fail’. For the grade ”Pass”, all examination assignments, reports and presentations must be approved.

Grades

Two-grade scale, U, G

Department

Institutionen för fysik, kemi och biologi

Director of Studies or equivalent

Magdalena Svensson

Examiner

Lars-Göran Mårtensson

Education components

Preliminary scheduled hours: 12 h
Recommended self-study hours: 148 h

Course literature

Kompendium med utdrag ur referenslitteratur, reviews inom ämnet, samt vetenskapliga artiklar. Excerpts from reference literature, scientific reviews and articles.

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://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.