FCB3205 Biomolecular Structure and Function for Doctoral Students 7.5 credits

Biomolekylers struktur och funktion för forskarstuderande

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for FCB3205 valid from Autumn 2021

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Eligible for studies at the third-cycle level.

Language of instruction

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

Intended learning outcomes

After completion of the course the student should be able to

- show in-depth knowledge of concepts in structural biology, and demonstrate the ability to explain and analyze complex concepts based on relevant research literature, and in a pedagogical way communicate the knowledge in writing.
- good ability to use suitable computer software and relevant databases to visualize, examine, analyze, evaluate and validate the structures and function of macromolecules.
- design, plan, implement and present in written and oral form an independent project in the field of structural biology
- evaluate and discuss structural-functional relationship from its sigificance in the perspective of sustainable societal development

Course contents

- The structure and function of biomolecules (structural biology) is a cornerstone in modern biotechnology. The course aims offer deepened theoretical and practical knowledge about the relationship between structure and function of macromolecules. The focus is on proteins and nucleic acids, as well as biomolecules that are functionally relevant to the macromolecular systems that are being addressed.
- In medical biotechnology, the relationship between the structure and function of proteins is an important basis for modern drug development, and in industrial biotechnology, the use and rational design of enzymes for sustainable bioprocesses are widely implemented approaches.
- Structural biology is a young science and research in this area is moving forward rapidly. The precise topics and exercises covered are subjects of change to appropriately reflect the research frontier. Topics covered in the course range from the foundations of macromolecular structure to experimental and theoretical methodology of structure determination and validation, and the application of knowledge about structure-function relationship.

Examination

- INL1 - Assignment, 1.5 credits, grading scale: P, F
- LAB1 - Laboratory work, 2.0 credits, grading scale: P, F
- PRO1 - Project, 4.0 credits, grading scale: P, 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.

If the course is discontinued, students may request to be examined during the following two academic years.

Grading criteria are specified in the course memo.

Other requirements for final grade

The theoretical part requires approved hand-in assignments that take the form of reflective and critically examining analyses of selected research articles in structural biology that builds further on the lectures. (INL1)

The laboratory part requires mandatory, active attendance during the exercises and written reports that are submitted at the end of each exercise, or at the time specified by the examiner. (LAB1)

The project is carried out individually and presented at the end of the course in the form of a written report, peer review of another student's project report and a short oral presentation. Part of the project is expected to be carried out outside the scheduled time. (PRO1)

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.