FSK3502 Cellular Biophysics 10.0 credits

Cellulär biofysik

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

Establishment

Course syllabus for FSK3502 valid from Spring 2019

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Enrolled PhD student.

Language of instruction

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

Intended learning outcomes

The main purpose of the course is to give the students practical knowledge about models and experimental methods to study the transport properties of biological cells.

After the course the participants should be able to:

- understand which molecules can be transported across cellular membranes and which mechanisms are used for the transport
- choose the relevant mathematical models to describe the transport of water, ions and solutes within cells and through the cellular membranes
- predict how water and ion homeostasis of the cells, as well as the membrane potential, are affected by the cell microenvironment
- understand the principles of microscopy-based measurements of biophysical parameters in living cells
- analyze the real data generated in biophysics experiments

Course contents

Models and equations describing the transport of water, ions and nutrients within cells and through cell membranes. Active and passive transport. Channels and carriers. Cell electrical potential (graded and action potential). Methods for measuring cellular physical parameters.

Examination

- INL1 - Hand-in assignment, 1.5 credits, grading scale: P, F
- LAB1 - Laboratory exercises, 4.0 credits, grading scale: P, F
- SEM1 - Seminar, 0.5 credits, grading scale: P, F
- TEN1 - Written exam, 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.

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.