



# DD2436 Modelling of Processes in Cell Biology 6.0 credits

Modellering av cellbiologiska processer

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

## Establishment

Course syllabus for DD2436 valid from Autumn 2009

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

## Specific prerequisites

Single course students: 90 university credits including 45 university credits in Mathematics or Information Technology. English B, or equivalent.

## Language of instruction

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

# Intended learning outcomes

After the course, the student should be able to

- explain the usage of, and the assumptions behind biophysical and biochemical models and methods
- compute basic biophysical and biochemical entities in stoichiometry, ion statics and ion dynamics, diffusion and cell compartments
- exemplify the usage of continuous, stochastic or boolean models
- explain models for synapses and their plasticity and of networks of neurons
- use and develop simulation programs for genetic, biochemical, and neural networks

so that the student

- is able to explain the usage of, and the assumptions behind biological models
- in the working life can perform biological modeling and simulation work

## Course contents

Methods for mathematical modeling and computer simulation of sub cellular processes and functions. The main focus is on biochemical networks, enzyme kinetics and cell signaling, genetic networks, and switches, are covered, as is also ion channel dynamics and biological morphogenesis. Both dynamical and diffusion aspects will be covered.

## Course literature

To be announced at least 4 weeks before course start at course web page. Previous year: Fall et al., Computational Cell Biology, Springer Verlag.

## Examination

- TEN2 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 1.5 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.

In this course all the regulations of the code of honor at the School of Computer science and Communication apply, see: [http://www.kth.se/csc/student/heder-skodex/1.17237?l=en\\_UK](http://www.kth.se/csc/student/heder-skodex/1.17237?l=en_UK).

## Other requirements for final grade

Examination (TEN2; 4,5 university credits).

Laboratory assignments (LAB1; 1,5 university credits).

## 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.