Course syllabus

Biological Modelling
Biologisk modellering

EXTG11, 4.0 credits, G2 (First Cycle)

Valid for: 2026/27
Faculty: Faculty of Engineering LTH
Decided by: PLED W
Date of Decision: 2026-04-20
Effective: 2026-05-18

General Information

Main field: Technology **Depth of study relative to the degree requirements:** First cycle, in-depth level of the course cannot be classified
Elective mandatory for: Pi3
Language of instruction: The course will be given in English on demand

Aim

The course aims to introduce common modelling and computational methods in biology.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- be able to independently apply computational and modelling methods used in biology

Competences and skills
For a passing grade the student must

- show ability to apply computational methods used in the course
- be able to independently apply knowledge of mathematics and computer science to biological problems.

Contents

The course consists of various modelling projects and each one of these is introduced in one to two preparatory lectures. The introductory lectures are followed by a modelling exercise, in most cases a computer exercise. The course focuses on biology topics that are feasible to model within theoretical biology, for example population genetics, population ecology and game theory. The course also contains mathematical methods that are inspired by biology, such as genetic algorithms, neural networks and cellular automata.
The programming language that is used is MATLAB, meaning that some knowledge of this software is useful.

Examination details

Grading scale: UG - (U, G) - (Fail, Pass)
Assessment: The course has no written examination test. The grading is based on the quality of the hand-ins of the exercises.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Modules
Code: 0117. **Name:** Biological Modelling.
Credits: 4.0. **Grading scale:** UG - (U, G).

Admission

Assumed prior knowledge: FMAF05 Systems and Transforms or equivalent.
The number of participants is limited to: No
Kursen överlappar följande kurser: EXTG15 TEK290 EXTG10

Reading list

- Handouts.

Contact

Course coordinator: Mikael Pontarp, mikael.pontarp@biol.lu.se
Examinator: Mikael Pontarp, mikael.pontarp@biol.lu.se

Further information

This course is an elective mandatory course in the third year of the engineering mathematics programme. The course runs in parallel with EXTG15 Biology, Introductory Course. EXTG11 consists of the theoretical and computational parts of EXTG15 whereas the broad introduction to biology in EXTG15 is not included in the course.