



**LUNDS UNIVERSITET**  
Lunds Tekniska Högskola

*Course syllabus*

## **Biologisk modellering** **Biological Modelling**

**EXTG11, 4 credits, G2 (First Cycle)**

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED W

**Date of Decision:** 2023-03-27

### **General Information**

**Main field:** Technology.

**Elective Compulsory 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.

## Admission

**Assumed prior knowledge:** FMAF05 Systems and Transforms or equivalent.

**The number of participants is limited to:** No

**The course overlaps following course/s:** EXTG15, TEK290, EXTG10

## Reading list

- Handouts.

## Contact and other information

**Course coordinator:** Anders.Brodin, Anders.Brodin@biol.lu.se

**Course homepage:**

<http://www.biologi.lu.se/utbildning/grund-och-avancerad-utbildning/kurser/kurser-grundniva/biologiska-kurser-pa-grundniva-for-teknologer>

**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.