

# Syllabus

for course at advanced level

**Biological Statistics III**  
**Biologisk statistik III**

**7.5 Higher Education  
Credits**  
**7.5 ECTS credits**

<b>Course code:</b>	BL8059
<b>Valid from:</b>	Spring 2016
<b>Date of approval:</b>	2016-02-29
<b>Department</b>	Department of Biology Education
<b>Main field:</b>	Biology
<b>Specialisation:</b>	A1F - Second cycle, has second-cycle course/s as entry requirements

## Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University.

## Prerequisites and special admittance requirements

Admittance to the course requires knowledge equivalent to Biological Statistics II 7,5 (BL7048) credits. (Three credits corresponds to approximately two weeks full-time studies). Swedish upper secondary school course English B or equivalent or one of the following tests. Cambridge CPE och CAE: Pass. IELTS : 6.0 (with no part of the test below 5.0). TOEFL (paper based): 550 (with minimum grade 4 on the written test part). TOEFL (computer based): 213. TOEFL (internet based): 79.

## Course structure

Examination code	Name	Higher Education Credits
HELA	Biological Statistics III	7.5

## Course content

The course covers advanced statistical concepts and methods that are currently in general use in biological research. The topics include linear models with one or more continuous and categorical variables, generalized linear models (for binomial and count data), statistical models for designs with random effects and multiple hierarchical levels (mixed models, blocks, nested designs and repeated measures). Bayesian statistics and the similarities and differences between Bayesian approaches and classical model fitting are also covered. The course aims at the application of statistical methods to research in the biological sciences.

## Learning outcomes

It is expected that the student after taking the course will be able to:

- show insights into the most regularly used advanced statistical methods in biological research and show an understanding of the importance of such methods for the analysis of biological data
- apply these methods to biological data
- interpret the results of both classical and Bayesian statistical analyses

## Education

The education consists of lectures and computer exercises.

Participation in computer exercises and group education associated with this is compulsory. An examiner may rule that a student is not obliged to participate in certain compulsory education if there are special grounds for this after consultation with the relevant teacher.

### **Forms of examination**

a. Examination for the course is in the following manner: measurement of knowledge takes place through: Written examinations.

If the instruction is in English, the examination may also be conducted in English.

b. Grading is carried out according to a 7-point scale related to learning objectives:

A = Excellent  
B = Very Good  
C = Good  
D = Satisfactory  
E = Sufficient  
Fx = Fail  
F = Fail

c. Grading criteria for the course will be distributed at the start of the course.

d. A minimum grade of E is required to pass the course, together with:

- participation in all compulsory education

e. Students who fail an ordinary examination are entitled to sit additional examinations as long as the course is offered. There is no restriction on the number of examinations. Examinations also include other obligatory elements of the course. Students who have passed an examination may not resit it in order to achieve a higher grade. Students who have failed on two occasions are entitled to request the appointment of a different examiner for the next examination. Any such request must be made to the departmental board. The course has at least two examinations for each academic year in the years in which instruction is provided. Intervening years include at least one examination.

f. Students awarded the grade Fx are given the opportunity to improve their grade to E. The examiner decides the supplementary assignments to be performed and the pass mark criteria. The supplementary assignments will take place before the next examination session.

### **Interim**

Students may request that the examination is carried out in accordance with this syllabus even after it has ceased to apply. This right is limited, however, to a maximum of three occasions during a two-year-period after the end of giving the course. A request for such examination must be sent to the departmental board.

### **Limitations**

The course may not be included in examinations in combination with the course Advanced biostatistics 7,5 hp (BL8038).

### **Misc**

The course is a component of the Master's Programme in Biology and it can also be taken as an individual course.

### **Required reading**

Course literature is decided by the departmental board and is described in an appendix to the syllabus.