Department of Biology Education

Stockholm University

Syllabus

for course at advanced level

Advanced Biostatistical Methods
Avancerad biostatistik

7.5 Higher Education Credits
7.5 ECTS credits

Course code:	BL8033
Valid from:	Spring 2009
Date of approval:	2009-01-12
Department	Department of Biology Education
Subject	Biology
Specialisation:	A1N - Second cycle, has only first-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 Biostatistics, Analysis and Presentation of Biological Data 15 hp (BL4011).(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
8033	Advanced Biostatistical Methods	7.5

Course content

The course covers advanced statistical methods that currently are in general use in biological research. The topics include linear models with several independent variables, statistical models for situations with more than one level of random effects (repeated measures and mixed models), and modern computer intensive methods like bootstrap and Markov Chain Monte Carlo (MCMC). Bayesian statistics and the similarities and differences between modern Bayesian approaches and classical model fitting and hypothesis testing are also treated. 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, including computer intensive methods, 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, computer exercises and project work.
Participation in computer exercises, project work 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 and/or oral examination

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:
- approved computer exercises
- approved written and oral presentations
- participation in all compulsory education

e. Students who fail to achieve a pass grade in an ordinary examination have the right to take at least further four examinations, as long as the course is given. The term “examination” here is used to denote also other compulsory elements of the course. Students who have achieved a pass grade on an examination may not retake this examination in order to attempt to achieve a higher grade. Students who have failed to reach a pass grade on two occasions have the right to request that a different teacher be appointed to set the grade of the course. A request for such appointment must be sent to the departmental board.

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.

Misc

The course is a component of the Bachelor's Programme in Biology a 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.