Department of Statistics

Stockholm University

Syllabus

for course at first level

Statistics II
Statistik II

30.0 Higher Education Credits
30.0 ECTS credits

Course code:	ST200G
Valid from:	Autumn 2009
Date of approval:	2007-04-25
Changed:	2008-10-15
Department	Department of Statistics
Subject	Statistics
Specialisation:	G1F - First cycle, has less than 60 credits in first-cycle course/s as entry requirements

Decision

This syllabus was approved by the Board of the Department of Statistics on April 25, 2007 and revised on October 15, 2008.

Prerequisites and special admittance requirements

Statistics I, first level, 30 ECTS credits or equivalent.

Course structure

Examination code	Name	Higher Education Credits
11SA	Statistical Theory with Applications I	7.5
12SA	Statistical Theory with Applications II	7.5
21VM	Optional part 1	7.5
31VM	Optional part 2	7.5
41VM	Optional part	15

Course content

The course consists of one mandatory course unit and optional course units:

The mandatory course unit is:
1. Statistical Theory with Applications, which is assessed as two parts:
1.1. Statistical Theory with Applications I
1.2. Statistical Theory with Applications II
Optional course units:
2. Optional course I 7,5 ECTS credits
3. Optional course II 7,5 ECTS credits or
4. Optional course 15 ECTS credits

Regarding the optional courses, see Miscellaneous.

The course gives extended knowledge in probability theory and statistical inference theory. Special attention is given to these theories' applications to economical, econometrical and social problems.

The concepts that are more thoroughly treated are:

Introduction to mathematical analysis. Basic concepts in probability theory, stochastic variables and probability distributions. Discrete and continuous distributions, univariate as well as multivariate. Moment-generating functions, the Law of Large Numbers and the Central Limit Theorem. Order statistics. Methods for point estimation like the method of moments, the least square method and the method of maximum likelihood. Properties of estimators like efficiency of estimators and sufficient statistics. Confidence intervals. Hypothesis testing. The lemma of Neyman-Pearson, Likelihood ratio tests. The Kolmogorov-Smirnov test. Run tests. Bayesian inference and resampling methods.

The course also consists of content from optional course units.

The content of the course gives extended knowledge of great use in applications of statistical methods in several fields.

Learning outcomes

After completing the course the student should be able to:
- solve and interpret problems in probability
- show good knowledge of the foundations of the theory of inference
- solve and interpret problems more advanced problems regarding distributions and tests
- formulate simple statistical models in some concrete situations.
- compute and interpret point- and interval-estimates and test hypotheses regarding parameters in statistical models

Moreover, the student is expected to achieve the learning outcomes for the optional courses.

Education

Teaching forms may consist of lectures, exercises, seminars, computer sessions and tutoring. Some compulsory attendance and other mandatory elements may be required.

Forms of examination

a. Examination will be done by assessing the learning outcomes. Examination will comprise written tests and written reports of group exercises.

b. Grading is done according to a seven-point scale related to the specified learning outcomes:
A = Excellent
B = Very Good
C = Good
D = Satisfactory
E = Adequate
Fx = Inadequate
F = Totally Inadequate

c. The assessment criteria for the course will be distributed at the beginning of the course.

d. In order to pass the course, the grade E or higher is required on the course units 1.1, 1.2, 2 and 3 or 1.1, 1.2 and 4

e. Students who receive the grade Fx or F on an examination are entitled to at least four additional examinations to achieve the lowest grade E as long as the course is still given.

Students who receive the grade E or higher on an examination may not retake this examination in order to attempt to achieve a higher grade.

Students who receive the grade Fx or F on an examination twice by the same examiner are entitled to request that a different examiner be appointed to set the grade of the examination. Such a request must be in writing and sent to the head of the department. Here, the term examination denotes all compulsory elements of the course.

Interim

Students can request examination in accordance with this syllabus up to three times during a period of two years after the course is no longer given. Such a request must be in writing and sent to the head of the department. Here, the term examination denotes all compulsory elements of the course.

Limitations

Misc

Please see our homepage for information regarding the optional courses. Other optional courses may be chosen after a decision by the examiner. Registering for the mandatory course unit and optional courses is done in the same manner as for free standing courses.

The course has previously been given under the course code ST2060.

Required reading

The course literature is described in appendices to the syllabus.