Department of Statistics

Stockholm University

Syllabus

for course at advanced level

Statistical Theory of Science
Statistisk vetenskapsteori

7.5 Higher Education Credits
7.5 ECTS credits

Course code:	ST742A
Valid from:	Spring 2016
Date of approval:	2014-02-19
Changed:	2015-09-09
Department	Department of Statistics
Main field:	Statistics
Specialisation:	A1N - Second cycle, has only first-cycle course/s as entry requirements

Decision

This syllabus is approved by the Board of the Department of Statistics on February 19, 2014, and revised on September 9, 2015.

Prerequisites and special admittance requirements

90 ECTS credits in Statistics or equivalent. Swedish upper secondary school course English 6 or equivalent.

Course structure

Examination code	Name	Higher Education Credits
11ST	Statistical Theory of Science	7.5

Course content

The course consists of one course module:

1. Statistical Theory of Science
The course covers some basic epistemological views on empirically based knowledge and statistical problem solving and modelling from an applied point of view. A pervading theme in the course is the role models play in empirical science.
The course takes as a starting point some basic epistemological views on knowledge, for example, how scientific knowledge is generated and how it changes. Different classic epistemological approaches are related to different statistical methods (e.g. hypothesis testing, Bayesian statistics, likelihood models) in order to highlight the relationship between philosophical questions about science, statistical inference and proofs/results.
The course also treats ethical aspects.

The course also gives a deeper understanding of experimental and non-experimental research methods, especially with respect to validity, causal conclusions, control of sources of error and handling of confounders. The course also provides tools to be able to independently examine the epistemological assumptions behind different statistical methods.

Learning outcomes

To pass the course the student should be able to:

- give an account of some important epistemological viewpoints and their relationship to statistical methods

- discuss the advantages and disadvantages of some experimental and non-experimental methods in specific situations, especially with respect to validity, causal conclusions, control of sources of error and handling of confounders.

Education

The teaching consists of lectures and exercises.

Forms of examination

a. Examination will be done by assessing the learning outcomes. Examination will be both written and oral.
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 unit.
e. Students who have received 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 given.
If a student has received the grade Fx on the written reports but is close to passing the assignment, there may be a possibility to hand in an additional assignment. The assignment should be handed in within the given time frame and after the examiner having advised on the need to revise the assignment.
Students who have received the grade E on an examination may not retake this examination in order to achieve a higher grade.
Students who have received the grade Fx or F on an examination on two occasions by the same examiner have the right to request that a different examiner be appointed to set the grade of the examination. The request must be in writing and sent to the head of the department.
The examination denotes all compulsory elements of the course.
Every time the course is given, there should be two examination opportunities during the current semester.

Interim

When the course syllabus is withdrawn, the student has the right to request examination once per semester during a period of three semesters in accordance with this syllabus. The request must be in writing and sent to the head of department.

Limitations

The course may not be included in a degree together with the course Statistical Methods (ST728A) 15 ECTS or equivalent.

Required reading

The course literature is described in an appendix to the syllabus.