School of Economics and Management

STAG35, Statistics: Programming for Statisticians, 7.5 credits

Statistik: Programmering för statistiker, 7,5 högskolepoäng

First Cycle / Grundnivå

Details of approval

The syllabus was approved by The Board of the Department of Statistics on 2024-05-27 (U 2024/331). The syllabus comes into effect 2024-05-28 and is valid from the spring semester 2025.

General information

First cycle level course in statistics. The course is elective in a Bachelor degree in Statistics. The course may also be taken as a single subject course or within other Bachelor and Master's programmes at Lund University.

Language of instruction: Swedish
The course is offered in Swedish, but teaching in English may occur.

Main field of study	*Specialisation*
Statistics	G1F, First cycle, has less than 60 credits in first-cycle course/s as entry requirements

Learning outcomes

The overall goal of the course is to provide an introduction to programming necessary for studies in statistics.

Knowledge and understanding

For a passing grade the student shall

- be able to explain fundamental concepts in imperative and object-oriented programming,
- be able to explain and give examples of the use of basic data types and simple algorithms,
- be able to explain step by step what happens when a program is run,

This is a translation of the syllabus
which was established in Swedish.

- be able to explain fundamental principles of simulation and Monte Carlo methods, and
- be able to explain why certain methods are computationally intensive.

Competence and skills

For a passing grade the student shall

- be able to import, modify and export data in various formats,
- be able to construct and implement algorithms to solve statistical problems,
- be able to write, organise, document, and distribute code in a structured way according to conventions,
- be able to structure programs using functions, classes, and methods,
- be able to stepwise develop, test, and debug programs,
- be able to independently plan and execute a simulation study, and
- be able to describe and discuss programming issues and how they can be solved.

Judgement and approach

For a passing grade the student shall

- be able to assess which data types, algorithms, and implementations are suited for solving different problems, and
- be able to use the documentation of the programming language to develop his or her competence.

Course content

The course gives an introduction to imperative and object oriented programming in general, and to programming aimed at solving statistical problems in particular. The course covers

- different data types,
- import, modification, and export of data,
- control flow using e.g. loops and conditional expressions,
- structures such as functions, methods, and classes,
- implementation of algorithms,
- good coding practices,
- distribution objects for standard distributions (e.g. density functions), and
- random number generation, simulation, and Monte Carlo methods.

Course design

The course is designed as a set of lectures, computer exercises, and seminars.

Assessment

The examination consists of quizzes, a written exam and projects that are presented in writing and orally at a seminar.

The University views plagiarism very seriously, and will take disciplinary actions against students for any kind of attempted malpractice in examinations and assessments. Plagiarism is considered to be a very serious academic offence. The penalty that maybe imposed for this, and other unfair practice in examinations or assessments, includes suspension from the University.

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.

Grades

Grading scale includes the grades: U=Fail, E=Sufficient, D=Satisfactory, C=Good, B=Very Good, A=Excellent

A (Excellent) 85-100 points/percent. A distinguished result that is excellent with regard to theoretical depth, practical relevance, analytical ability and independent thought.

B (Very good) 75-84 points/percent. A very good result with regard to theoretical depth, practical relevance, analytical ability and independent thought.

C (Good) 65-74 points/percent. The result is of a good standard with regard to theoretical depth, practical relevance, analytical ability and independent thought and lives up to expectations.

D (Satisfactory) 55-64 points/percent. The result is of a satisfactory standard with regard to theoretical depth, practical relevance, analytical ability and independent thought.

E (Sufficient) 50-54 points/percent. The result satisfies the minimum requirements with regard to theoretical depth, practical relevance, analytical ability and independent thought, but not more.

F (Fail) 0-49 points/percent. The result does not meet the minimum requirements with regard to theoretical depth, practical relevance, analytical ability and independent thought.

To pass the course, the students must have been awarded the grade of E or higher.

The grade is determined as the weighted results of the quizzes (10%), the projects (40%), and the exam (50%).

Entry requirements

General entry requirements and STAA40 Statistics: Basic Course or STAA41 Statistics: Basic Course 1 or the equivalent.

Further information

The course replaces STAG25/STAG26 Statistics: Statistical Programming and STAG32 Statistics: Programming for Statisticians. The courses may not be combined in a degree.

Should the course be discontinued, there will be three additional examination opportunities within one year after the regular examination session. During this period, there will also be opportunities to complete the other examination components.