



School of Economics and Management

## **STAA40, Statistics: Basic Course, 30 credits**

*Statistik: Grundkurs, 30 högskolepoäng*  
First Cycle / Grundnivå

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### **Details of approval**

The syllabus was approved by The Board of the Department of Statistics on 2021-11-29 to be valid from 2022-08-29, autumn semester 2022.

### **General Information**

The course constitutes the first semester in statistics. It may be taken as a single subject course or can be included as an optional course in some programmes. The course is an elective course in the Bachelor of Science Programme in Politics and Economics.

*Language of instruction:* Swedish

*Main field of studies*

Statistics

*Depth of study relative to the degree requirements*

G1N, First cycle, has only upper-secondary level entry requirements

### **Learning outcomes**

The overall learning outcome is that the student should develop statistical reasoning, i.e. the ability to use statistical methods to draw conclusions based on data.

#### **Knowledge and understanding**

For a passing grade, the student shall

- be able to explain the difference between censuses and sample surveys as well as between different levels of measurements,
- be able to account for concepts such as centre, variability and distribution,
- be able to account for fundamental concepts within probability theory,
- be able to account for fundamental concepts within statistical inference such as point estimation, interval estimation, and hypothesis testing,
- be able to explain the difference between correlation and regression,
- be able to account for basic approaches in design of experiments,

- be able to account for concepts in statistical sample surveys and questionnaire construction, and
- demonstrate insights about analysis of variance, logistic regression and non-parametric methods.

### **Competence and skills**

For a passing grade, the student shall

- be able to independently visualise different types of data,
- be able to calculate descriptive statistics,
- be able to calculate probabilities for basic probability models,
- be able to calculate point and interval estimates,
- be able to analyse statistical relationships using correlation and regression models,
- be able to perform hypothesis testing of various parameter estimates,
- be able to in writing present the results of statistical analyses,
- be able to independently design and analyse experiments,
- be able to formulate a problem and solving it by designing a questionnaire, collecting data, analysing the data, and present the solution in writing and orally,
- be able to analyse statistical problems using analysis of variance, logistic regression and non-parametric methods,
- be able to independently perform analyses using statistical software, and
- be able to interpret and draw relevant conclusions from statistical analyses.

### **Judgement and approach**

For a passing grade, the student shall

- be able to do appropriate choices of visualisations and descriptive statistics to illustrate data,
- be able to judge the choice of an appropriate probability model,
- be able to reason about choices of statistical methodology,
- be able to discuss sources of uncertainty in surveys,
- be able to reason about the significance of statistics for society,
- be able to judge the setup and design of experiments,
- be able to judge the setup and design of statistical sample surveys, and
- be able to make ethical considerations in connection with statistical surveys.

### **Course content**

The course is made up of three modules with the following contents:

#### *Module 1: Basics (15 cr.)*

The module provides an introduction to statistical science. The following areas are covered:

- Visualisation of data and descriptive statistics,
- Basic probability theory,
- Statistical inference, e.g. point estimation, interval estimation, and hypothesis testing,
- Analysis of statistical relationships, e.g. correlation analysis and regression analysis.

#### *Module 2: Statistical Analysis and Design of Experiments (10 cr.)*

The module covers design of experiments with multiple factor designs, analysis of variance, logistic regression, non-parametric methods.

### *Module 3: Survey Methodology in Theory and Practice (5 cr.)*

The module covers theoretical and practical aspects of statistical surveys, e.g. data collection methods, questionnaire design, and applicable ethical guidelines and regulations. The module revolves around the practical application of the knowledge.

## **Course design**

### *Module 1: Basics*

The module consists of lectures, exercises, tutorials, computer lab sessions, and group work.

Attendance at the initial computer lab session is mandatory. If there are special reasons, the examiner may grant an exemption from the attendance requirement and instead decide on a replacement assignment.

Module 2 and 3 run in parallel during the latter half of the course.

### *Module 2: Statistical Analysis and Design of Experiments*

The module consists of lectures, exercises, tutorials, and computer lab sessions. During the module, the students must also design, perform and analyse small experiments, which are reported as laboratory reports.

### *Module 3: Survey Methodology in Theory and Practice*

In this module the students must plan, perform, analyse and both in writing and orally report on a statistical survey. They must also review the report of another group. The task is done in groups of approximately four students. The teaching consists of an introductory meeting, lectures, supervision sessions, and final seminar.

Attendance at the introductory meeting, all supervision sessions and the final seminar is mandatory. For individual occasions, the examiner may grant an exemption from the attendance requirement and instead decide on a replacement assignment.

## **Assessment**

The module *Basics* is examined using written assignments, quizzes, a test and a final written exam.

The module *Statistical Analysis and Design of Experiments* is examined using quizzes, written assignments, and a final written exam.

The module *Survey Methodology in Theory and Practice* is examined by conducting a survey which is presented both as a written report 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.

*Subcourses that are part of this course can be found in an appendix at the end of this document.*

## Grades

Marking scale: Fail, E, D, C, B, A.

**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.

Individual examinations may have the grading scale Pass/Fail.

Grades are given for examinations and full course, but not for modules. The grade of the full course is determined as a weighted mean of the results of the examinations expressed as percentages of the maximum scores. The following weights are utilised:

### **Module - Examination : Weight**

Basics - Quizzes : 2,5 %

Basics - Assignments : 5 %

Basics - Test : 12,5 %

Basics - Exam : 30 %

Statistical Analysis and Design of Experiments - Quizzes : 2,5 %

Statistical Analysis and Design of Experiments - Assignments : 5 %

Statistical Analysis and Design of Experiments - Exam : 30 %

Survey Methodology in Theory and Practice : 12,5 %

## Entry requirements

General and courses corresponding to the following Swedish Upper Secondary School Programs: English 6, Mathematics 3b/3c and Social Studies 1b/1a1+1a2.

## Further information

The course may not be combined with STAA41 or STAA42 in a degree.

This course replaces STAA30 Statistics: Basic Course.

If the the course is discontinued, another five exam opportunities will be arranged within one year after the regular exam.

## Subcourses in STAA40, Statistics: Basic Course

Applies from H22

- 2201 Basics - Quizzes, 1,0 hp  
Grading scale: Fail, Pass
- 2202 Basics - Assignments, 2,0 hp  
Grading scale: Fail, Pass
- 2203 Basics - Test, 4,0 hp  
Grading scale: Fail, Pass
- 2204 Basics - Exam, 8,0 hp  
Grading scale: Fail, Pass
- 2205 Statistical Analysis and Design of Experiments - Quizzes, 1,0 hp  
Grading scale: Fail, Pass
- 2206 Statistical Analysis and Design of Experiments - Assignments, 2,0 hp  
Grading scale: Fail, Pass
- 2207 Statistical Analysis and Design of Experiments - Exam, 7,0 hp  
Grading scale: Fail, Pass
- 2208 Survey Methodology in Theory and Practice, 5,0 hp  
Grading scale: Fail, Pass