Graduate Studies in Statistics
General Study Syllabus

This plan applies to students who are conducting graduate work in statistics in pursuit of either a licentiate degree or a doctoral degree.

Educational Objectives

The doctoral program is intended to provide graduate students with a deep, foundational education in statistics, along with further in-depth knowledge in the student's chosen area of specialization. The purpose of the program is furthermore to provide the graduate student with the skills needed to apply statistical methods to practical problems, study current literature, and conduct scientific research, with particular emphasis on the development of statistical methods. Students should also develop skills in presenting and disseminating their research in both academic and non-academic settings.

Research students in statistics must have the following:
- Broad general knowledge of statistical research
- Deep, specialized knowledge in their chosen field of study
- Familiarity with scientific methodology in general, and with statistical methods in particular
- An ability for scientific analysis and synthesis, critical review, and assessment of novel, complex phenomena
- The ability to formulate research questions critically, independently, creatively, and with scientific accuracy
- The ability to plan and conduct research and other activities correctly, accurately, and on schedule
- Intellectual independence, scientific integrity, and the ability to do research ethics assessments
- The ability to make a significant contribution to the field through their own original research, and to document this contribution in a dissertation

Admittance to the program

In order to be admitted to the graduate studies program, all applicants must meet certain basic criteria. At minimum, applicants to the program in statistics must have:
1. completed a degree at an advanced level, or
2. completed at least 240 credits of coursework, at least 60 of which must be at an advanced level, or

3. acquired equivalent knowledge by some other means, either inside or outside of Sweden.

If there are special circumstances, the faculty board has the latitude to exempt individual applicants from the formal requirements. There may also be additional assessments of the applicant's qualifications for admission into the program.

The Admissions Process

3.1 The Application
The application for admission to postgraduate studies in statistics should be submitted to the head of the Department of Computer and Information Science (IDA).

3.2 The Selection Process
If the number of eligible applicants exceeds the number of available openings, applicants will be selected based on their fitness for the program. In the course of the selection process, both the applicant's strengths and capabilities as well as the competences of potential supervisors in the area of statistics will be taken into consideration, in an effort to select applicants who are most likely to thrive at IDA.

3.3 Decision to Admit
The decision to admit an applicant into the program for postgraduate studies in statistics will be made by the head of the Department of Computer and Information Science (IDA).

3.4 Restrictions on Admission
The number of students who are admitted to the postgraduate program will not exceed the number of doctoral positions being offered, based on current conditions and available financing.

4 Educational Design

4.1 General
To obtain a doctoral degree in statistics, candidates must complete 90 credits of coursework and must then write a dissertation, which is worth 150 credits, for a total of 240 credits. Students can also choose to begin their doctoral studies by pursuing a licentiate degree, which requires 60 credits of coursework and a thesis, which is also worth 60 credits. Some students also choose to obtain only their licentiate degree.

Up to 30 credits can be granted for previous achievements if:
- the achievements are judged to be at an advanced level
- the achievements are not already included in the prerequisites for the doctoral program

Decisions regarding the awarding of credits for previous work are made by the professor with the most relevant academic background, based on the recommendation of the student's primary supervisor.

4.2 Required courses for licentiate and doctoral degrees

Both licentiate and doctoral degrees must include courses in probability theory, inference theory, computational statistical methods and stochastic processes, totaling at least 24 hp. All graduate students who have been newly admitted after 1 January 2015 must also complete at least 6 credits in one of the compulsory courses in methodology/ethics, or must have equivalent competence. Research students who teach must take a course in higher education pedagogy. All of the individual courses that a student takes are determined by the student's primary supervisor in consultation with the student. Some of the courses are traditional instructor-led classes, while others primarily involve literature studies. The graduate studies also include the research environment's seminar activities.

4.3 Elective courses

Elective courses are intended to provide students with in-depth theoretical and methodological studies, both of topics in their own field of study and related subjects. Research students develop their own plans of study in cooperation with their supervisors, and can choose courses from within the department or from other institutions, including courses from outside of LiU. Optional courses include regular recurring courses, reading courses, and other forms of self-study.

4.4 Additional information

Additional information about the doctoral program can be obtained by contacting the Department of Computer and Information Science (IDA).

4.5 Dissertation for doctoral degree

To obtain a doctoral degree, doctoral students must write a scientific dissertation with a scope that corresponds to 150 higher education credits. The dissertation must be based on independent research and must be relevant to existing research in the student's chosen area of study. The dissertation may either be designed as a single, cohesive work (monograph dissertation) or as a compilation of scientific essays written by the research student, alone or with another person, supplemented with a summary discussion (compilation thesis). In the latter case, the quality of the essays must be at least equivalent to the quality of published work in recognized scientific journals. If the essays have been written collaboratively by two or more people, it must be clear which parts of the work that were conducted by the research student. The dissertation must be defended in a public session (dissertation defense). The rules of procedure for the dissertation defense are enumerated in the Higher Education Ordinance, to which local application regulations have been added, as established by the University Board and the board of the Faculty of Arts and Sciences.

4.6 Essay for licentiate degree

To obtain a licentiate degree, the student must write a scientific work with a scope corresponding to 60 higher education credits. The thesis must be based on independent research work, and like the doctoral dissertation, this work can be designed either as a monograph dissertation or as a compilation thesis.

5 Structure of the education

5.1 Individual study plan

Every research student must work with their supervisor to establish an individual study plan for their doctoral education. The plan must cover the courses that will be included in the student's education and the schedule for courses and dissertation work. Both the student and their supervisor must certify in writing that they have developed the study plan, along with any changes that may have been made to it. Every student's study plan must be reviewed at least once a year and must be revised or made more specific if necessary.

5.2 Teaching

Teaching in the doctoral program is conducted in the form of lectures, seminars, and tutorials. Research students must take part of the scientific activities at the department , both in their own areas of expertise and more generally, by attending seminars, guest lectures, etc. Doctoral students must actively participate in seminars by presenting articles and sections of their dissertations, and by actively participating in discussions about the work of other researchers and research students. It is part of the research institution's responsibility to offer doctoral students the opportunity to participate in international conferences and courses.

5.3 Tutorial

Research students are entitled to supervision during their postgraduate education for a period of time up to the equivalent of four years of full-time studies for a doctoral degree and two years of full-time studies for a licentiate degree. Upon admission to the doctoral program, each research student is assigned a principal supervisor and an assistant supervisor based on a decision by the head of the department. The board may also appoint additional assistant supervisors, either simultaneously or later on in the student's education, to ensure that research students receive adequate supervision regarding both scientific method and subject theory of particular relevance to their dissertation. The head of the department can also appoint a new principal supervisor if a doctoral student request it.

The supervisor is responsible for advising the student regarding the focus, scope and implementation of the student's research, and the supervisor will also consult with the student regarding choice of subject for the student's dissertation. The primary supervisor must, at minimum, hold qualification required for appointment as a docent as well as completed research supervisor training or possess equivalent competence. Assistant supervisors must have completed a doctoral degree or possess equivalent scientific competence.

6 Examination

Examination of courses is arranged during or in connection with the courses to which they correspond. Exams may be administered orally and/or in writing in accordance with the examiner's detailed instructions. Exams are graded as "passed" or "failed." The primary supervisor will be the examiner for courses for which no special examiner has been appointed. The doctoral dissertation is assessed by a grading committee in accordance with the rules of the Higher Education Ordinance, along with additional regulations that have been established by the University Board and by the Faculty of Arts and Sciences. The dissertation must be assessed as either "passed" or "failed."

The board of the Faculty of Arts and Sciences decides on the formal rules that will govern the licentiate thesis presentation. Grades for the licentiate dissertation are assessed by a person appointed by the department review committee, which will consist of at least three PhD instructors. The licentiate thesis must be assessed as either "passed" or "failed."