



GENERAL SYLLABUS FOR THE THIRD CYCLE PROGRAMME IN STATISTICS

BACKGROUND

The basis for the doctoral program at Jönköping University (JU) is the regulation in the Law/Act (1993: 792) on the authorization to issue certain degrees. The requirements for a doctoral and a licentiate degree are found in Appendix 2 of the Higher Education Ordinance (1993: 100).

In addition to the above, the third cycle programmes are regulated by, the degree requirements laid down in this general syllabus for third-cycle education within the subject of Statistics and the local regulations for third-cycle education decided by the President of Jönköping University (Regulations and guidelines for first, second, and third level education at Jönköping University).

DESCRIPTION OF THE THIRD CYCLE SUBJECT AREA

Statistics is a scientific discipline that studies methods of collection, analysis and interpretation of empirical data with the purpose of quantifying uncertainty and making inferences about underlying populations and mechanisms. Our aim is to develop and implement advanced statistical methodology and fill the gap between statistical theory and real-world applications. Statistical methods are widely used in quantitative research and empirical sciences. However, our focus is mainly on methods used within social sciences such as business administration, economics and sustainability among others. Programing and computer-intensive statistical methods are gaining in importance nowadays and it is an important part of the research conducted.

For the Degree of Doctor of Philosophy, the third-cycle student shall fulfil the following intended learning outcomes (Högskoleförordning (SFS nr: 1993:100)).

Knowledge and understanding

1. demonstrate broad knowledge and systematic understanding of Statistics as well as advanced and up-to-date specialised knowledge in a limited area of this field, and
2. demonstrate familiarity with research methodology in general and the methods of Statistics in particular.

Competence and skills

3. demonstrate the capacity for scholarly analysis and synthesis as well as to review and assess new and complex phenomena, issues and situations autonomously and critically,
4. demonstrate the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake research and other qualified tasks within predetermined time frames and to review and evaluate such work,
5. demonstrate through a dissertation the ability to make a significant contribution to the formation of knowledge through his or her own research,
6. demonstrate the ability in both national and international contexts to present and discuss research and research findings authoritatively in speech and writing and in dialogue with the academic community and society in general,
7. demonstrate the ability to identify the need for further knowledge, and

8. demonstrate the capacity to contribute to social development and support the learning of others both through research and education and in some other qualified professional capacity.

Judgement and approach

9. demonstrate intellectual autonomy and disciplinary rectitude as well as the ability to make assessments of research ethics, and
10. demonstrate specialised insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used.

For the Degree of Licentiate the third-cycle student shall fulfil the following intended learning outcomes (Högskoleförordning (SFS nr: 1993:100)).

Knowledge and understanding

1. demonstrate knowledge and understanding in Statistics including current specialist knowledge in a limited area of this field as well as specialised knowledge of research methodology in general and the methods of Statistics in particular.

Competence and skills

2. demonstrate the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake a limited piece of research and other qualified tasks within predetermined time frames to contribute to the formation of knowledge as well as to evaluate this work,
3. demonstrate the ability in both national and international contexts to present and discuss research and research findings in speech and writing and in dialogue with the academic community and society in general, and
4. demonstrate the skills required to participate autonomously in research and development work and to work autonomously in some other qualified capacity.

Judgement and approach

5. demonstrate the ability to make assessments of ethical aspects of his or her own research,
6. demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used, and
7. demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

TITLE OF QUALIFICATION

The degree awarded is

- Doctor of Philosophy in statistics (Swe: Filosofie doctor) and
- Licentiate of Science in Statistics (Swe: Filosofie Licentiat).

VALIDITY AND TRANSITIONAL RULES

The general syllabus is valid for doctoral students admitted after the general syllabus has been established.

Any change to this general syllabus must be documented in the individual study plan.

The following transition rules apply:

PhD candidates can change to the new syllabus if they fulfill the current general requirement for being accepted to the PhD program after approval by their main supervisor.¹

ENTRY REQUIREMENTS & SELECTION

In order to be admitted to the third cycle programme the applicant must meet the general entry requirements prescribed in the *Admissions and employment regulations for doctoral students at Jönköping University* (Dnr. JU 2019/2357-15). The applicant must also be assessed as having the general capacity to successfully complete the programme.

An applicant meets the general entry requirements for third-cycle studies if he or she has:

- been awarded a degree at second-cycle level,
- achieved at least 240 credits, of which a minimum of 60 credits must have been achieved at second cycle level, or
- otherwise acquired equivalent knowledge in Sweden or abroad.

SPECIFIC ENTRY REQUIREMENTS

A person meets the specific entry requirements for education at third-cycle in statistics if he/she:

- acquired at least 90 credits in Statistics, and
- acquired the corresponding knowledge mainly in some other way, inside or outside the country.

SELECTION AND ADMISSION

Admission to doctoral studies at JIBS is restricted. Applicants will be assessed and selected based on previous academic merits, experience, areas of research interest and the expected capability to successfully complete studies within the intended timeframe.

Applicants are admitted to the PhD program in accordance with the *Admissions and employment regulations for doctoral students at Jönköping University* (Dnr. JU 2019/2357-15).

Upon admission, the Research Faculty Board will approve any credit to be awarded for previous coursework, as well as decide what consequences these awarded credits will have for the contract with the admitted student.

Courses at first cycle or corresponding education may not be credited towards education at third cycle. Courses at second cycle or corresponding education may at most be credited to the extent it exceeds the qualifying requirements for the education at third cycle, within the framework for applicable goals and degree requirements for the education at third cycle. Credits can be awarded for doctoral courses taken at other universities after an assessment of the course at JIBS.

THE STRUCTURE OF THE PROGRAMME

The study period for the PhD degree normally amount to 4 years (48 months) of full-time studies and for the licentiate degree, 2 years (24 months) of full-time studies.

Doctoral studies comprise a total of 240 credits, 100 credits of coursework and 140 credits for the doctoral thesis.

¹ If a candidate that was admitted to an old syllabus change to the new syllabus, they are not allowed to include 15 credits for their Master's degree in the required course credits.

Studies for the Licentiate degree require a total of 120 credits, 50 credits of coursework and 70 credits for the licentiate thesis.

In addition to the objectives for postgraduate education that are stated in the national degree ordinance (Appendix 2 to the Higher Education Ordinance), the postgraduate education shall contribute to creating an identity as a researcher. This includes, among other things, active participation in seminar activities both related to their own research education subject and in other contexts, nationally and internationally.

PHD COURSES

Coursework for doctoral studies in Statistics include compulsory and elective courses.

The compulsory courses for both the licentiate and doctoral degree in statistics are (or equivalent):

- Statistical Inference theory (15 credits)
- Probability Theory (7.5 credits)
- Philosophy of Science (7,5 credits).

For the doctoral degree, the following courses and credits are also required (or equivalent):

- Econometrics (15 credits)
- Large Sample Theory (7.5 credits)
- Computational statistics (7.5 credits)

The elective courses should be within statistics, courses in other fields can be approved if they are in line with the PhD student's dissertation work and are accredited by JIBS.

JIBS together with a network of other universities (GRAPES - Swedish Network for Graduate and Postgraduate Education in Statistics) offer the compulsory postgraduate courses and a number of elective courses each academic year, e.g. courses within specific profile areas. Candidates may also increase their selection of elective courses by taking doctoral courses at other universities.

Research Seminars

A doctoral student is expected to participate in research seminars given at JIBS and is expected to present his/her own work at least once every semester. The doctoral student is also required to participate in the feedback sessions that are scheduled with the senior faculty and the doctoral student, normally once every six weeks. Two seminars are compulsory for all doctoral student, the research proposal seminar (RP) and the final seminar (FS).

Admitted doctoral students are expected to take an active part in the life of the organisation including attending RP seminars, final seminars, thesis defences, research seminars, as well as being involved in projects and write research funding applications.

Doctoral students are encouraged to spend part of their studies at another university abroad to take postgraduate courses and/or work with their thesis.

Thesis work

The doctoral thesis comprises 140 credits. The third-cycle student shall write the thesis individually. The thesis can either have the form of a compilation -- normally an introductory chapter and three to five publishable articles (publishable in reputable journals), which the student has authored individually or together with others -- or take the form of a monograph (a uniform, connected work). If a compilation thesis consists of three publishable articles, they all

have to be single authored, and if the thesis consists of four or five publishable articles at least two have to be single authored.

The Licentiate thesis comprises 70 credits. The student shall prepare the thesis individually. It can have the form of a monograph or a compilation of articles.

Supervision

Upon enrolment to the programme, the doctoral student is appointed a main supervisor and an assistant supervisor within the subject area. The main supervisor must be an associate professor (docent) or a full professor, and the assistant supervisor must have a PhD degree. A third supervisor can also be appointed, who must have a PhD degree.

The appointed supervisors can be changed upon request from the doctoral student or the supervisor.

The Individual study plan (ISP)

For each doctoral student, an individual study plan is constructed in cooperation between the doctoral student and his or her supervisors. (ISP regulations you find in *Regulations and guidelines for education at Jönköping University, JU 2020/2367-14*). Doctoral students' performance is evaluated yearly, and the doctoral student's contract is renewed on the condition that the candidate is making progress with his/her studies and thesis in accordance with the individual study plan.

Any deviations from the individual study plan should be brought to the attention of the supervisor by the doctoral student as soon as they are detected. The doctoral student shall keep the supervisors informed on a continual basis of the progress of the work on the thesis and other studies in relation to the individual study plan and in accordance with the supervisor's instructions. In the case of inadequate candidate performance, the JIBS Research Faculty Board determines what measures are to be taken. If there are serious deficiencies, the decision can be made not to renew the contract. Such decisions are taken by the Research Faculty Board.

EXAMINATION AND EVALUATION

The doctoral and licentiate degree requires passing marks for all the required postgraduate courses and a public defence of one's thesis. For an approved doctoral or licentiate degree, an approved grade is required on all parts of the examination that are included in the education.

In addition, it should be clear from the individual study plan that the degree objectives for the desired degree are met.

Knowledge tests during postgraduate education can be done by written or oral examination or by other appropriate means.

A doctoral thesis must be defended in a public defense, and a licentiate thesis must be defended at a public seminar.

Fulfillment of the degree objectives in Appendix 2 of the Higher Education Ordinance (and in this general syllabus) is checked by the help of the individual study plan.

The doctoral thesis and the licentiate thesis are assessed with the grades failed or passed.

Defence of the Doctoral Thesis

There is a preliminary examination of the manuscript for the doctoral thesis at an internal research seminar (final seminar) and through a written statement by an external assessor (with the expertise equivalent to associate professor/docent or full professor). After approval of the external assessor and the supervisors, JIBS send in a written and signed form to the Board of Education and Research Education (NUF) suggesting a date for the defence of the thesis, an

faculty examiner, an examining committee and a chairperson, in accordance with the regulations stipulated in *Regulations and guidelines for education at Jönköping University (JU 2020/2367-14)*.

The faculty examiner must be a recognized researcher with experience from the area of research in question. The examining committee is normally comprised of three members (the gender balance must be considered when appointing the members of the committee), of whom the majority should belong to the faculty of other universities. Both the faculty examiner and the members of the examining committee should have the expertise equivalent to associate professor/docent or full professor.

The examining committee appoints one of its members to be the chairperson for the committee discussions.

The grade of the thesis is set by the examining committee, in which the majority opinion constitutes the decision of the committee. The grade of pass or fail shall be recorded together with a written motivation, including a summarized assessment of the thesis and of the public defence. Jönköping University awards the doctoral degree.

The Licentiate Seminar defence

JIBS announce the licentiate seminar to NUF in writing as outlined in *Regulations and guidelines for education at Jönköping University (JU 2020/2367-14)*.

The faculty examiner should be a recognised researcher with experience from the area of research in question. The examination of the Licentiate degree at JIBS is done by an examining committee comprising of three members: the external faculty examiner, one external researcher, and one internal, all with the expertise equivalent to docent/associate professor or full professor. The examining committee appoints one of its members to be the chairperson for the committee discussions. The examining committee meets directly after the licentiate seminar. The examining committee, in which the majority opinion constitutes the decision of the committee, grades the licentiate thesis. The grade of pass or fail shall be recorded together with a written motivation.

JIBS award the licentiate degree.

LANGUAGE

Doctoral and licentiate theses at JIBS shall be written in English.

The public doctoral dissertation defence and the licentiate seminar shall be held in English.

Exceptions from these rules concerning language need to be motivated and approved by JIBS Research Faculty Board (RFB).