

# Adoption of General Syllabus in Information Systems

Please note that this is a translation of a legal document and is not in itself legally valid. In the event of any differences, the Swedish document takes precedence.

## Decision

The Faculty of Arts and Sciences decides to adopt the general syllabus in Information Systems.

## Reason behind the decision

Representatives have submitted a request to the faculty for a revision of the general syllabus for doctoral studies in Information Systems. The main changes in the general syllabus consist of changes in the number of credits for courses and the licentiate thesis for the licentiate degree, as well as the number of included articles in a compilation thesis.

## Processing of the decision

This decision has been made by Dean Ulf Melin after presentation by the Faculty programme director Charlotta Einarsson.

The matter was prepared by the Faculty of Arts and Sciences' Doctoral Studies Committee on 18 March 2024.

# General Syllabus for Doctoral Studies in Information Systems

Please note that this is a translation of a legal document and is not in itself legally valid. In the event of any differences, the Swedish document takes precedence.

The syllabus applies to students completing the program with a doctoral degree and to students completing the program with a licentiate degree (SCB code 50804).

## Objectives of the Education

The doctoral studies in Information Systems aim to deepen the student's knowledge in the subject area and make the student well-prepared for independent contributions in research and development work. The doctoral studies thus aim to prepare for professional activities as an independent researcher or for qualified educational, investigative, or development work where research competence in Information Systems is significant.

The goal of the education is to provide the student with the ability to independently plan and conduct a qualified research effort and to present and disseminate their research results within and outside academia.

In the doctoral subject of Information Systems, the focus is on studying people's work with developing and changing IT-based information systems in organisations and society, as well as the possible effects on people, organisations, and society. This includes theories, perspectives, strategies and policies, models, methods, work forms in digitisation, and IT tools (digital resources) regarding system development. Various development and change situations can be studied, such as planning/control/coordination, analysis/investigation/specification, procurement, structuring, design, implementation, evaluation, management/further development, replacement, and decommissioning of information systems, as well as interaction with other forms of organisational development. IT-based information systems studied in the subject can be part of larger infrastructures and shared resources, of a more standalone nature, or packaged in various ways, e.g., in the form of services. The subject also includes conditions for and results of digitisation, e.g., studies of the use and consequences of information systems as a result of system development or as a prerequisite for change and further development of systems.

Doctoral studies and research in Information Systems are based on several long-term research themes and sustainable and current research projects. Both scientific and practical relevance guide the direction of the research. To achieve the goals of a doctoral education, efforts are required to develop research competence among the students. The purpose of doctoral studies in Information Systems is, by definition, to educate researchers in the subject area. This means that a significant

part of the doctoral studies consists of training in research work. To achieve good research competence, the doctoral student, under supervision, must perform various research tasks (preferably in project form). This requires the doctoral student to train in defining, describing, reporting, critically reviewing, discussing, and defending research results in various ways and for different audiences, both in writing and orally (at seminars and conferences, etc.). It is also important that the doctoral student develops other skills during their doctoral education that are significant for continued work as a researcher. Examples of such skills include participating in the review of manuscripts in scientific journals, before or at scientific conferences and seminars, organising conferences and seminars, writing research plans, research applications, and collaboration agreements, and maintaining contacts with research funders and organisations in the practical field.

## Degree Objectives

The national degree objectives for the doctoral degree and the licentiate degree are divided here, in accordance with the Higher Education Ordinance, into objectives for knowledge and understanding, for skills and abilities, and for judgment and approach. These objectives are formulated as follows (Higher Education Ordinance, Appendix 2).

## Knowledge and Understanding

For the *doctoral degree*, the doctoral student shall:

- demonstrate broad knowledge and a systematic understanding of the research field, as well as advanced and up-to-date specialised knowledge in a limited area of the research field, and
- demonstrate familiarity with scientific methodology in general and with the specific research field's methods in particular.

For the *licentiate degree*, the doctoral student shall:

- demonstrate knowledge and understanding within the research field, including current specialised knowledge in a limited area of this field, as well as advanced knowledge of scientific methodology in general and the specific research field's methods in particular.

## Skills and Abilities

For the *doctoral degree*, the doctoral student shall:

- demonstrate the ability for scientific analysis and synthesis as well as independent critical review and assessment of new and complex phenomena, issues, and situations,
- demonstrate the ability to critically, independently, creatively, and with scientific precision identify and formulate questions, as well as to plan and

conduct research and other qualified tasks within given time frames using appropriate methods, and to review and evaluate such work,

- demonstrate the ability to significantly contribute to the development of knowledge through their own research in a dissertation,
- demonstrate the ability to present and discuss research and research results with authority in both national and international contexts, orally and in writing, in dialogue with the scientific community and society at large,
- demonstrate the ability to identify the need for further knowledge,
- demonstrate the ability to contribute to society's development and support others' learning in both research and education as well as in other qualified professional contexts.

For the *licentiate degree*, the doctoral student shall:

- demonstrate the ability to critically, independently, creatively, and with scientific precision identify and formulate questions, to plan and conduct a limited research project and other qualified tasks within given time frames using appropriate methods, thereby contributing to the development of knowledge, and to evaluate this work,
- demonstrate the ability to clearly present and discuss research and research results in both national and international contexts, orally and in writing, in dialogue with the scientific community and society at large, and
- demonstrate the skills required to independently participate in research and development work and to independently work in other qualified activities.

## Judgment and Approach

For the *doctoral degree*, the doctoral student shall:

- demonstrate intellectual independence and an analytical approach to knowledge formation,
- be able to assess the weaknesses and strengths of their own dissertation,
- demonstrate scientific integrity and the ability to make research ethical assessments,
- demonstrate deep insight into the possibilities and limitations of science, its role in society, and people's responsibility for how it is used.

For the *licentiate degree*, the doctoral student shall:

- demonstrate the ability to make research ethical assessments in their own research,
- demonstrate insight into the possibilities and limitations of science, its role in society, and people's responsibility for how it is used, and

- demonstrate the ability to identify their need for further knowledge and take responsibility for their knowledge development.

## Eligibility

To be admitted to doctoral studies, the applicant must have both basic eligibility and specific eligibility as described below. Furthermore, the applicant must be assessed to have the overall capacity to complete the program.

### Basic Eligibility

Basic eligibility for admission to doctoral studies is granted to those who have:

- obtained a degree at an advanced level,
- completed course requirements of at least 240 higher education credits (HP), of which at least 60 credits are at an advanced level, or
- acquired substantially equivalent knowledge through other means, within or outside the country.

The faculty board may grant exceptions to the requirement for basic eligibility for individual applicants if there are special reasons.

### Specific Eligibility

Specific eligibility is granted to those who have knowledge equivalent to HP in Informatics or an equivalent main field of study.

The requirements for basic and specific eligibility are also considered fulfilled by those who have obtained an equivalent older degree or acquired equivalent knowledge within or outside the country.

## Admission

### Application

Application for admission to doctoral studies in Information Systems should be submitted to the person responsible for doctoral studies in the subject.

### Admission Limitations and Selection

Only as many doctoral students as can be offered supervision, acceptable study conditions, and study financing may be admitted to the doctoral program.

Admission limitations are applied if the number of eligible applicants exceeds the number of available openings. The basis for selection among eligible applicants for doctoral studies in Information Systems is the degree of skill to benefit from such education. The assessment is made of the applicant's potential to develop good skills to conduct qualified scientific work. This involves an assessment primarily of qualities such as creativity, analytical sharpness, written and other communicative skills, independence and initiative, integrity, cooperation ability, work capacity, and perseverance. The following circumstances are considered in the selection process:

- study results that demonstrate creativity, maturity, the ability to make independent judgments, and critical analysis
- special knowledge and skills of the applicant, for example, acquired through professional activities, which may be significant for benefiting from the doctoral education.

The selection is primarily based on documented and self-cited material by the applicant, such as independent study works and certificates of professional activities. Additionally, other decision-making materials such as interviews with the applicant are significant for the selection. During admission, consideration is also given to the competence of the supervisors/teachers associated with the doctoral program and how these competencies are expressed in prioritised research themes. Thus, it is also crucial that the student has a research orientation that aligns with current or planned research initiatives within the subject area.

Students admitted to doctoral studies in Information Systems are those employed as PhDs at the department or students employed at another university/college or in a company or a government agency.

## Admission Decision

The faculty board for the Faculty of Arts and Sciences' delegation of decision-making authority regarding education indicates which body makes the decision on admission to doctoral studies.

## Structure of the Program

### General

The education for the licentiate degree comprises 120 HP and consists of courses totalling 45 HP and a scientific essay of 75 HP. Such a degree can either be the final goal of the education or a stage in the education towards a doctoral degree.

The education for the doctoral degree builds upon the completed licentiate degree. The education for the doctoral degree comprises 240 HP and consists of courses totalling 90 HP and a dissertation of 150 HP. Doctoral students who have written a master's thesis with a close subject and temporal relation to the dissertation work may be given the opportunity to write a doctoral dissertation without a preceding licentiate degree. This assessment is made on a case-by-case basis, and the decision is made by the primary supervisor in consultation with other supervisors within the research environment.

### Courses

Doctoral students who teach must complete a course in higher education pedagogy. Such a course can be included in elective courses.

The course "Dissertation Seminars" is mandatory for presenting, discussing, and defending dissertation texts in both the writing of a licentiate thesis and a doctoral

dissertation. A significant part of this course is to review and discuss others' texts. At least once a year, the doctoral student must present partial results of their dissertation work within the course "Dissertation Seminars." The doctoral education also includes active participation in the research environment's seminars.

In addition to the specific course "Dissertation Seminars" mentioned above, the following types of courses are mandatory: (1) an advanced course in Informatics within the local research environment or an equivalent course at another institution where the relevant subject is represented at the doctoral level, (2) an advanced course in research methodology (focus on qualitative analysis), and (3) a course in academic writing. The latter two courses can be taken at the student's own institution or at another institution. The total extent of the three types of courses mentioned above must amount to at least 15 HP for the doctoral degree. For the licentiate degree, two of the three types of courses must be represented, and the extent must amount to at least 10 HP. The choice of courses is made in dialogue with the primary supervisor.

For each individual student, adjustments can be made considering their prior knowledge and in relation to the requirements set by participation in the research environment. The individually determined courses are established by the student's primary supervisor in consultation with the student. In some courses, organised teaching is provided, while in other courses, knowledge is developed through individual literature studies ("reading courses").

Undergraduate courses at least at the advanced level, which are not included in the conditions for specific eligibility, can be credited towards the doctoral education after approval by the primary supervisor.

## Dissertation for the Doctoral Degree

For the doctoral degree, the doctoral student must produce a scientific dissertation, which corresponds to 150 HP. The dissertation must be based on independent research work and be significant for research in the chosen area. The dissertation is written either as a monograph or a compilation dissertation in Swedish or English. If the dissertation is a monograph, parts of the scientific work leading to the doctoral dissertation must also be presented in an international context on at least two occasions (peer-reviewed conference papers or workshop contributions). In these two contributions, the doctoral student must have had a primary author role. If the dissertation is a compilation dissertation, it should be based on four to six journal articles or peer-reviewed conference papers. If the doctoral student has written a licentiate essay in the same doctoral subject, articles from this can be included in the doctoral dissertation. The doctoral student must also demonstrate independence by authoring at least one included sub-work without having the main or assistant supervisor as a co-author. The introductory chapter of a compilation thesis should add clear value beyond the included sub-works. The introductory chapter should contain comparative and more cohesive and integrative parts that abstract and refine the knowledge contributions found in the

included sub-works. The introductory chapter should be seen as a clear knowledge contribution in itself and be able to be read, understood, and reviewed as a standalone part of the dissertation.

Before the doctoral dissertation is presented at the public defence, it must be collectively presented and reviewed at a final seminar where an external opponent, together with colleagues, contributes to quality assurance.

The dissertation must be defended in a public defence. Rules regarding the defence procedure can be found in the Higher Education Ordinance, supplemented by local application regulations determined by LiU and the faculty board for the Faculty of Arts and Sciences.

## **Essay for the Licentiate Degree**

For the licentiate degree, the doctoral student must produce a scientific work corresponding to 75 HP. The licentiate essay is written either as a monograph or a compilation in Swedish or English. If the essay is a monograph, part of the scientific work leading to the essay must also be presented in an international context on at least one occasion (peer-reviewed conference paper or workshop contribution). In this contribution, the doctoral student must have played a significant role as the main or co-author. If a compilation format is chosen, the essay should be based on two to three journal articles or peer-reviewed conference or workshop contributions. The doctoral student must also demonstrate independence by writing the introductory chapter. The introductory chapter of a compilation essay should add value beyond the included sub-works. It should contain comparative and more cohesive and integrative parts that develop the knowledge contributions found in the included sub-works. The introductory chapter should be seen as a knowledge contribution in itself and be able to be read and reviewed as a standalone part of the essay.

The licentiate essay must be based on independent research work. The licentiate essay must be defended at a public seminar. The faculty board for the Faculty of Arts and Sciences decides on the specific format for the presentation of the scientific licentiate essay.

## **Organisation of the Education**

### **Individual Study Plan**

In consultation with the primary supervisor, the doctoral student shall establish an individual study plan for their doctoral education, specifying the courses to be included in the education and the timeline for courses and dissertation work. The individual study plan should be established as soon as possible after admission and finalised no later than two months after the student has commenced their studies. The individual study plan should be followed up and revised as needed at least



once a year. The detailed forms regarding the individual study plan are outlined in LiU's decision on Guidelines for Doctoral Education.

## Teaching

Teaching is mainly conducted in the form of lectures, seminars, and supervision. During their studies, the doctoral student should participate in scientific activities by attending seminars, guest lectures, etc., and presenting results at the research environment's seminars. The student may be given the opportunity to participate in teaching and examinations at another faculty or institution. It is the responsibility of the research environment to offer the doctoral student opportunities to participate in international conferences and courses abroad. Most doctoral courses are chosen, in consultation with the primary supervisor, within the student's own subject area. Courses from other relevant subjects can also be chosen, in consultation with the primary supervisor. Courses are taken in accordance with the student's individual study plan. Participation in courses should preferably support not only subject-specific advanced knowledge but also promote the development of research competence. All doctoral students (regarding licentiate essay or doctoral dissertation) must follow the specific dissertation seminars in course form that are continuously offered within the research environment.

## Supervision

The student is entitled to supervision during their education unless the Vice-chancellor decides otherwise. Supervisors in the subject are jointly responsible for the quality and implementation of the doctoral education. The choice of dissertation topic should be made in consultation between the doctoral student and the primary supervisor and should occur during the first semester of the education.

At least two supervisors should be appointed for each doctoral student. One of them should be the primary supervisor. The faculty board for the Faculty of Arts and Sciences' delegation of decision-making authority regarding education indicates which body makes the decision on the appointment of supervisors. The primary supervisor should be qualified as a docent and have completed doctoral supervision training. Assistant supervisors should have a doctoral degree or equivalent scientific competence. Assistant supervisors can come from IEI or outside the department. The assistant supervisor can be within the relevant subject area or have valuable competence in a related subject area for the essay or dissertation. A doctoral student who requests it should be allowed to change supervisors.

The primary supervisor should, especially towards the end of the work, advise the doctoral student on possible career paths after completing their doctoral studies. Such a career discussion is also held in connection with employee and career guidance discussions.

## **Examination**

Knowledge assessment is conducted through written or oral examinations. Exams and tests are assessed with either of the grades pass or fail. The primary supervisor acts as the examiner for courses where a separate examiner has not been appointed.

A doctoral dissertation is assessed by an examination board in accordance with the regulations in the Higher Education Ordinance, supplemented by local application regulations determined by the Vice-chancellor and the faculty board for the Faculty of Arts and Sciences. When assessed, consideration is given to both the content of the dissertation and its defence. The dissertation is graded as either pass or fail.

The board of the Faculty of Arts and Sciences decides on the specific format for the presentation of the licentiate essay. The licentiate essay is graded as either pass or fail.

## **Other**

The general syllabus comes into effect on 4 June 2024. Doctoral students admitted from this date are admitted to this version of the general syllabus. Doctoral students admitted before the above date can, after documented agreement with the primary supervisor, follow this version of the general syllabus.