Graduate studies at Linnaeus University is governed in the Swedish Higher Education Act and the Higher Education Ordinance, plus the local rules for graduate education that the University has established. In which bodies decisions are made, is apparent from the University’s decision-making and delegation of authority regulations.

Curriculum for third-cycle studies in the field of Computer and Information Science at the graduate level

Curriculum and research programme for studies in the field of Computer and Information Science at the graduate level, adopted by the Board of the Faculty of Technology on 05/02/2016, taking effect as of 05/02/2016.

The fields of computer science, information science and informatics, and media technologies are included in the graduate education Computer and Information Science, and the respective subjects are described below under the heading Educational Programme.

1. Educational Programme

At Linnaeus University, the field and course of study referred to as Computer and Information Science covers a wide spectrum of approaches and activities within the area. Within the field, developed and analysed concepts, language, programming methods and tools for both efficient large-scale software development and data scientific problems in specific application areas, both from a theoretical and practical perspective.

Informatics is the scientific subject which develops knowledge about people’s design and use of information technology in individual and organisational contexts as well as the society in general. These relationships are studied empirically and contribute to the theoretical, methodological, and conceptual development of knowledge. The research is characterised by the ambition that the interaction of people and information technology is studied with in interdisciplinary or multidisciplinary perspective. Proven theories, concepts and methods are used within both old and new areas of application, in the study of working life and everyday existence. Relationships between people and information technology are altered as a consequence of developments in technology, something which also has implications for the organisation of work processes and the everyday lives of people in general. New methods are also developed and applied for the study of these new phenomenon. A graduate degree programme in information science at Linnaeus University contains both empirical and theoretical studies. Doctoral students normally choose a specialisation for their studies in conjunction with the commencement of their graduate programme.

The subject media technologies at the Linnaeus University includes a variety of approaches within the field (such as design & development of interactive systems, Web and mobile development, as well as advanced human-computer interaction techniques, just to name a few). Within the subject, methods, tools and various technical solutions are developed and analysed, for the effective development, implementation and evaluation of media technical
systems. The focus also lies on current problems within specific application areas, both from a theoretical and practical perspective.

2. The objectives of the educational programme
2a. PhD

Goals according to the Higher Education Regulation

Knowledge and understanding
For the doctoral degree, the doctoral student must
- show broad knowledge in and a systematic understanding of the particular field of research and subject in general, as well as an in-depth and genuine specialist knowledge within a defined part of the field of research, and
- show familiarity with scientific methodology in general and with the specific research area methods in particular.

Skills and abilities
For the doctoral degree the student is required to
- display the ability to engage in scientific analysis and synthesis, as well as to independently make a critical review and assessment of new and complex phenomena, issues/problems and situations,
- display the ability to critically, independently, creatively and with scientific accuracy, identify and formulate issues, as well as the ability to plan and carry out a research and other advanced tasks with appropriate methods within given time frames and review and to evaluate such work,
- show, with a doctoral dissertation, his/her ability to contribute substantially to the development of knowledge with their own research,
- display the ability in both national and international contexts, orally and in writing, to be able to present and discuss research and research results with authority in dialogue with the scholarly community and society in general,
- display the ability to be able to identify their needs for further knowledge, and
- display the ability to contribute within research and training as well as in the other advanced professional contexts to the development of society, and to support the learning of others.

Capacity to make evaluations and communication skills
For the doctoral degree, the doctoral student must
- display intellectual independence and scientific probity, plus the ability to make ethical assessments related to research, and
- display an in-depth insight into the possibilities of science and its limitations, its role in society, and the individual’s personal responsibility for how it is used.

Specific goals for the educational programme
For a PhD in Computer and Information Science, the doctoral student must
- be prepared for a hypothetical future labour market.

Contents and achievement of goals
A doctoral degree in Computer and Information Science ordinarily requires four years of study full-time and is attained after completing an educational programme of at least 240 higher education credits consisting of coursework totalling 90 credits and an approved
scientific dissertation of 150 credits. The graduate educational programme in Computer and Information Science at Linnaeus University is designed so that all the planned objectives are fulfilled.

**Course component**
The course component of the programme consists of required courses and elective courses.

Required course (core curriculum)
- Theory of Science, 4 credits

Elective courses
Elective courses with relevance to the subject and/or for dissertation work, 86 credits. Which elective courses the graduate student should take depends upon the specific focus of the research and is determined by the examiner in consultation with the graduate student and their academic supervisor. The actual courses is established in the individual study plan, see below.

**The dissertation work and its quality assurance**
To obtain a doctoral degree, the doctoral student must write a scientific dissertation. The dissertation must be based on an independent research project and be of relevance and significance for the research within the selected field or discipline. The requirement of independent work does not preclude that the dissertation work can be part of a larger research project.

The dissertation can take the form either of a cohesive scientific work, a monograph dissertation or a compilation dissertation. The dissertation must contain:
- well-formulated, well-defined, and well-motivated research topics and issues,
- a well articulated and well-reflected research design,
- a selected and well-described theoretical base that is utilised,
- well-described empirical basis,
- empirically and theoretically well-founded contribution to knowledge, and
- abstracted contribution to knowledge that shows the capability of transferability.

The dissertation as a whole must present a high degree of coherence, both in structure and logical consequence.

A compilation dissertations should normally contain at least 4 articles, and a compilation part (kappa). The articles should have a quality which is deemed sufficient for them to be published in a peer reviewed academic or scholarly journal, presented at peer reviewed conference of high quality, or published in an anthology of high quality. The compilation component must also contain a discussion of the work’s theoretical basis, and relationship to previous research. The relationship between the articles shall also be discussed in the compilation part. In the event any of the articles/papers are co-authored with other individuals, the author of the doctoral dissertation must identify their efforts and contributions in the preface.

A scientific dissertation that has been written by two or more individuals may be accepted as a dissertation provided that the authors’ efforts can be distinguished.
The quality assurance of the thesis work occurs regularly in seminars and at presentations at international conferences. A final seminar, corresponding to an “internal defence of the dissertation,” will be held when the dissertation work has been assessed as being virtually completed.

The dissertation should preferably be written in English, in order to facilitate international assessment. Dissertations written in English are to have a summary in Swedish. If the dissertation is written in Swedish, it must have a summary in English.

**Achievement of goals**
The instruction is given in the form of individual tutoring, courses, and seminars. During the entire duration of participation in the programme, the graduate student is expected actively participate in research seminars within the field of Computer Science, Informatics and Media Technology.

Which optional courses should be included in the degree is determined by the examiner in consultation with the graduate student and their academic supervisor. External courses given by other departments or educational institutions can be included in this.

Higher education teaching training is mandatory for doctoral students who intend to teach.

**2 b. Licentiate degree**

**Goals according to the Higher Education Regulation**

**Knowledge and understanding**
*For the Licentiate degree, the licentiate student must*
- display knowledge and understanding in the particular field of research, including relevant specialist knowledge in a defined part of this, as well as specialised knowledge of research methodology in general and the specific research area’s methods in particular.

**Skills and abilities**
*For the Licentiate degree, the licentiate student must*
- show the ability to critically, independently, creatively and with scientific accuracy, identify and formulate issues, to plan and carry out a limited research project and other advanced tasks with adequate and methods within given time frames and thereby contribute to the development of knowledge, and to evaluate this work,
- show the ability in both national and international contexts, orally and in writing, to be able to clearly present and discuss research and research results in dialogue with the scholarly community and society in general, and
- show the skills required to independently participate in research and development work and to work independently in other advanced contexts.

**Capacity to make evaluations and communication skills**
*For the Licentiate degree, the licentiate student must show*
- the ability to make assessments concerning responsible conduct of research relating to their own research,
- insight into the possibilities of science and limitations of science, its role in society and the individual’s personal responsibility for how it is used, and
Specific goals for the educational programme
For a Licentiate degree in Computer and Information Science, the doctoral student must
- be prepared for a hypothetical future labour market.

Contents and achievement of goals
The Licentiate degree in Computer and Information Science ordinarily requires two years of study full-time and is attained after completing the educational programme of at least 120 higher education credits consisting of coursework of 60 credits and an approved scientific thesis of 60 credits.

Course component
The course component of the programme consists of required courses and elective courses.

Required course (core curriculum)
- Theory of Science, 4 credits

Elective courses
Elective courses with relevance to the subject and/or for the thesis work, 56 credits, which is to be specified in the individual study plan.

The thesis work and its quality assurance
To obtain a Licentiate degree, the licentiate student must write a scientific thesis of 60 higher education credits. The thesis must be based on independent research work and maintain a good scientific quality.

The quality assurance of the thesis work occurs regularly in seminars and at presentations at international conferences. The final seminar, corresponding to an “internal presentation,” will be held when the thesis work has been assessed as being virtually completed.

The thesis should preferably be written in English, in order to facilitate international assessment. A thesis written in English is to have a summary in Swedish. If the thesis is written in Swedish, it must have a summary in English.

Achievement of goals
The achievement of goals for the Licentiate degree occurs on the same principles as set out for the doctoral degree, and with regard to the wording of the Higher Education Ordinance, for the same as reasons described above.

3. Other information
In the ordinary case, departmental duties in the amount of 20% is included, or alternatively an internship or employment in the business world. The duration of the graduate programme is extended to the same extent, in this case 5 years. Within departmental duties, the organisation of conferences, working with classes at the undergraduate level, and work with the content of courses and educational plans may occur.
4. Individual study plan and division of responsibilities
The individual study plan describes the division of responsibilities, individual programme and course of studies, specific courses, dissertation/thesis work, attainment of goals, and academic guidance leading to a degree. The plan is established by the principal academic supervisor and the graduate student in consultation with the examiner and Head of Department, and a follow-up review will be made at least once annually. It should clearly indicate from the follow-up review how the research and writing is progressing towards the degree.
For general guidelines, see HF Chapter 6, § 29.

The principal academic supervisor is responsible for the overall planning of the doctoral programme and for that the stated issues and hypotheses are sufficiently relevant and interesting, and can be put together in a context. The purpose of this that the dissertation/thesis work will proceed independent of any temporary absence of the principal academic supervisor. The principal academic supervisor also has the responsibility for ensuring that the doctoral student’s dissertation output forms a whole in the final stages of their graduate studies.

The examiner has the responsibility for ensuring that the individual study plan sets out, at every instance a review is conducted, how the various degree objectives in this general study plan, Linnaeus University’s internal rules and regulations, and the Higher Education Ordinance, will be complied with for the graduate student. The examiner is responsible for ensuring that the graduate student, after completing the graduate education, fulfils all of the goals.

The Head of Department for the department to which the doctoral candidate is attached, typically via an academic employment position, has the responsibility for ensuring that the requirements that exist in the research environment and the graduate student’s working relationship are satisfied. The head of department should take the initiative for the updating of the study plan in the event significant changes in the research environment so requires.

Which decision making body has authority over the graduate students’ individual study plans is apparent by the University’s decision and delegation of authority rules. The decision making body must take action in the event any of the parties who signed on to the individual study plan do not fulfil their obligations.

A current individual study plan must be available throughout the duration while the graduate studies progresses.

5. Assessment

Licentiate Seminar
The opponent and the chairman of the licentiate seminar are designated. The licentiate thesis is graded by doctoral examiner with the exception of cases where the examiner is the doctoral student’s assistant academic supervisor. In such case, another assessor to determine the grade of the licentiate thesis must be appointed. The licentiate thesis must be defended orally at a public seminar led by a chairman.

The public defence of the doctoral dissertation
An examination board shall consist of three members. At least one member of the examination board must be someone who is not employed at Linnaeus University. The examination board may not consist of more than one member who is actively engaged in the same field/environment as the doctoral student. All of the members of the examination board
should at a minimum be associate professors or have equivalent expertise. An individual who has been the academic supervisor for the graduate student may not be a member of the examination board. Both genders should be represented in the examination board. The above provisions on participation in the grading of the doctoral dissertation also apply when an alternative member assumes the place of an ordinary member upon their withdrawal from the board.

The courses from the educational programme will be graded Pass or Fail by one of the specifically appointed university teachers (examiner). With the examination and grading of the doctoral dissertation, LnU’s Local Rules for Graduate Studies are applied.

Prior to the issuance of the diplomas, the examiner must certify in writing that all the goals of the graduate programme are fulfilled.

6. Prerequisites
6a. Basic prerequisites
The prerequisite policy is stated in HF Chap. 7, §35 and HF Chap. 7, §39.

6b. Specific prerequisites
The prerequisites policy is stated in HF Chap. 7, §40.

Specific prerequisites for admission to graduate studies in Computer and Information Science are required.
- approved courses of a minimum of 90 credits in the subject Computer and Information Science or the equivalent, and
- an individual study project of a minimum of 15 credits in the subject Computer and Information Science, or the equivalent.

7. Evaluation and selection criteria
Applications to the graduate studies are governed by rules in the admission regulations.

The selection of candidates is made with regard to the applicant’s ability to successfully complete and benefit from their studies at the graduate level. The assessment takes into account academic skills documented in scientific works, especially focused on the quality of the essays at the undergraduate level, any advanced work and other scientific or scholarly works. The assessment also takes into account breadth and composition of the undergraduate degree as well as the picture which the intended principal academic supervisor, examiner, and other colleagues in the research group and the subject obtained of the applicant’s potential.

The applicants are ranked by the entity concerned for the graduate education after a statement of opinion is received from the prospective principal academic supervisor with proposals on order of precedence.

Selection among applicants who meet the requirements of §35 and §36 will be made with regard to their potential ability to benefit from the educational programme.

The University determines which assessment criteria are to be applied in determining the potential ability to benefit from the educational programme. See also (HF Chapter 7, §41).
8. Admission
Admission is governed in the admission regulations and Chapter 7, § 36 of the Higher Education Ordinance. The relevant decision-making and preparatory bodies are apparent from the University’s decision-making and delegation of authority regulations.

9. Transition rules
Eventual transitional rules in relation to the earlier general curriculum. A graduate student who was accepted for admission to an earlier general curriculum can complete the degree accordance with this under the precondition that the current Higher Education Regulation is complied with.

Graduate students admitted to the older curriculum in the graduate studies subject Computer and Information Science, Doc no.: 2012/154 can switch to the current general curriculum.

10. The abbreviation of the academic degree
For graduate degrees within the subject Computer and Information Science, the title “Philosophy” is used as the first element.

11. The possibility to obtain a 2-year degree
Within the subject Computer and Information Science, there is the possibility for graduate students who have the earning of a PhD as their ultimate objective to receive a Licentiate degree.