L

GENERAL CURRICULUM FOR EDUCATION AT POST-GRADUATE LEVEL IN
COMPUTER SCIENCE

TFN Chair, 2007-06-21

Admission in Computer Science has ended 2011-01-01

1 Subject Area

Education at post-graduate level in Computer Science focuses on the design, development and analysis of efficient algorithms and software for complex computer-based systems. Central elements are algorithms and data structures for computational problems and algorithms that can be applied in networks, software applications and software development methods.

2 Programme curriculum

Education at post-graduate level in Computer Science that concludes with a licentiate degree comprises a total of two years' full time study (120 higher education credits) and consists of a study programme that gives 30-60 higher education credits and a licentiate thesis that gives 60-90 higher education credits.

Education at post-graduate level in Computer Science that concludes with a doctorate comprises a total of four years' full time study (240 higher education credits) and consists of a study programme that gives 60-120 higher education credits and a doctoral thesis that gives 120-180 higher education credits.

The education consists of a combination of courses and thesis work. In consultation with his/her supervisor, the student draws up a study programme of courses in both the student's own and related subjects. The supervisor decides the number of credits awarded for each course. The types of course vary. Some courses are given in the form of lectures while others are chiefly self-study courses. Minor projects are often included in the courses. In general, the courses assume a substantial degree of independence in the work compared to courses at advanced level.

In the thesis work, under the guidance of his/her supervisor the student independently formulates and solves a qualified research assignment and presents his/her findings. The research assignment may be part of a larger project with several parties involved, where collaboration is required and some degree of project management may sometimes be needed.

For a doctorate, the thesis must fulfil the publication requirements that apply as regards international journals of good repute in the subject area. A licentiate thesis is presented at a seminar with an external examiner and is graded by the examiner. A doctoral thesis is defended at a public disputation with an external opponent and is graded by a grading committee appointed by the faculty board. Both theses are graded Pass or Fail.

An individual study programme is drawn up for every post-graduate student (according to a fixed model) where the study programme is specified in detail. The individual study programme is followed up at least once a year by the post-graduate student and his/her supervisor and is then approved by the head of department, as delegated by the faculty board.

3 Eligibility and selection

3.1 General eligibility requirements
As specified in Section 39 of Chapter 7 of the Higher Education Ordinance and the local guidelines laid down in the Admission Rules for Post-graduate Education at Luleå University of Technology.

3.2 Specific eligibility requirements
Main area at advanced level: Computer Science/ Engineering Physics and Electronic Engineering/ Mathematics or related area.

For applicants who achieved basic eligibility before 1 July 2007: Master of Science degree in Engineering/ Master of Technology or equivalent with main subject as above.

Good skills in oral and written communication in English.

3.3 Selection
As specified in Section 41 of Chapter 7 of the Higher Education Ordinance and the local guidelines laid down in the Admission Rules for Post-graduate Education at Luleå University of Technology.

For selection for education at post-graduate level in Computer Science the following selection criteria apply:
Personal qualities relevant to education at post-graduate level

4 Examinations included in the education
The education consists of courses and an academic thesis. Examinations included in post-graduate programmes are graded Pass or Fail. Course and licentiate thesis grades are decided by specially appointed teachers (examiners). Doctoral thesis grades are decided by a specially appointed grading committee.

4.1 Courses
An individual study programme consisting of courses and a thesis is drawn up for each admitted post-graduate student. As a rule, the study programme is determined as the student's interest develops in the direction of one of the subject's sub-fields. Courses can be followed individually or in groups. In the latter case, teaching will often be in the form of teacher-led seminars. The course content is chosen according to the student's interest. The courses given in the subject area vary from year to year in line with current directions in the department's research activities.

Algorithm Analysis, Programming Language Theory and Complexity Theory are compulsory courses.

4.1.1 Recognition of prior studies
As specified in the local guidelines laid down in the Admission Rules for Post-graduate Education at Luleå University of Technology.

4.2 Academic thesis
An academic project in the form of a dissertation/thesis in Computer Science shall be presented as a homogenous, cohesive academic work (monograph) or a brief summary – comprehensive summary – of academic essays (composite thesis) that the post-graduate student has written alone or together with another person or persons.

Thesis manuscripts shall be presented at one or more research seminars or be subjected to equivalent review through the agency of the department.

The licentiate thesis is defended orally at a public licentiate seminar and is graded Pass or Fail. When the thesis is graded both the content of the thesis and the defence of the thesis are taken into consideration. The grade of a licentiate thesis is decided by an examiner appointed by the head of department.

The doctoral thesis is defended orally at a public disputation and is graded Pass or Fail. When the thesis is graded both the content of the thesis and the defence of the thesis are taken into consideration. The grade of a doctoral thesis is decided by a grading committee that is appointed for each thesis.

5 Degree
In Computer Science, a post-graduate student who has been admitted to a doctorate has the possibility to take a licentiate degree after completing a portion giving at least 120 higher education credits of the education that will be concluded with a doctorate.

5.1 Degree objectives
As specified in the degree description (Higher Education Ordinance, Appendix 2 – Degree Ordinance. See also the appendix below.

5.2 Degree title
A post-graduate student who takes a licentiate degree in Computer Science receives the degree title of Licentiate in Technology.

A post-graduate student who takes a doctorate in Computer Science normally receives the degree title of Doctor of Technology.

Requests for another degree title are made according to established guidelines.

6 Entry into effect and interim regulations
The previous general curriculum will cease to apply for post-graduate students who are admitted to education at post-graduate level after 1 July 2007. Post-graduate students admitted before this date may choose to either follow the previous curriculum or transfer to the present curriculum.

Qualifications ordinance (Higher Education Ordinance, Annex 2) Contents
the qualifications that may be awarded in the third cycles, and
the requirements to be fulfilled for the award of each qualification (qualification descriptors).

THIRD-CYCLE QUALIFICATIONS
General qualifications

Degree of Licentiate [Licentiatexamen]
Scope

A Degree of Licentiate is awarded
either after a third-cycle student has completed a study programme of at least 120 credits in a subject in which third-cycle teaching is offered,
or after a third-cycle student has completed one part comprising at least 120 credits of a study programme intended to conclude with the award of a PhD, if a higher education institution decides that a licentiate of this kind may be awarded at the institution.

Outcomes

Knowledge and understanding
For a Degree of Licentiate the third-cycle student shall
•demonstrate knowledge and understanding in the field of research 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 the specific field of research in particular.

Competence and skills
For a Degree of Licentiate the third-cycle student shall have:
•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 in order to contribute to the formation of knowledge as well as to evaluate this work
•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
•demonstrate the skills required to participate autonomously in research and development work and to work autonomously in some other qualified capacity.

Judgement and approach
For a Degree of Licentiate the third-cycle student shall
•demonstrate the ability to make assessments of ethical aspects of his or her own research
•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
•demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

Thesis
For a Degree of Licentiate the third-cycle student shall have been awarded a pass grade for a research thesis of at least 60 credits.

Miscellaneous

Specific requirements determined by each higher education institution itself within the parameters of the requirements laid down in this qualification descriptor shall also apply for a Degree of Licentiate with a defined specialisation.

Degree of Doctor

Scope
A Degree of Doctor is awarded after the third-cycle student has completed a study programme of at least 240 credits in a subject in which third-cycle teaching is offered.

Outcomes

Knowledge and understanding
For the Degree of Doctor the third-cycle student shall
•demonstrate broad knowledge and systematic understanding of the research field as well as advanced and up-to-date specialised knowledge in a limited area of this field, and
•demonstrate familiarity with research methodology in general and the methods of the specific field of research in particular.
•demonstrate the capacity for scholarly analysis and synthesis as well to review and assess new and complex phenomena, issues and situations autonomously and critically
•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
•demonstrate through a dissertation the ability to make a significant contribution to the formation of knowledge through his or her own research
•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
•demonstrate the ability to identify the need for further knowledge and
•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
For the Degree of Doctor the third-cycle student shall
•demonstrate intellectual autonomy and disciplinary rectitude as well as the ability to make assessments of research ethics, and
•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.

Research thesis (doctoral thesis)
For the Degree of Doctor the third-cycle student shall have been awarded a pass grade for a research thesis (doctoral thesis) of at least 120 credits.

Miscellaneous
Specific requirements determined by each higher education institution itself within the parameters of the requirements laid down in this qualification descriptor shall also apply for a Degree of Doctor with a defined specialisation. Ordinance (2008:132)