



**GENERAL SYLLABUS FOR EDUCATION AT THIRD-CYCLE LEVEL
IN
ELECTRIC POWER ENGINEERING**

TFN chair 2012-10-30

1 Subject Area

Electric power engineering covers studies of sustainable systems for production of electrical energy, transport of electrical energy and the interaction between power grid, electricity production and electricity consumption.

2 Programme curriculum

Education at third-cycle level in Electric Power Engineering that concludes with a Degree of Licentiate comprises a total of two years' full time study (120 credits) and consists of a study programme that results in 30-60 credits and a licentiate thesis that results in 60-90 credits.

Education at third-cycle level in Electric Power Engineering that concludes with a Degree of Doctor comprises a total of four years' full time study (240 credits) and consists of a study programme that results in 60-90 credits and a doctoral thesis that results in 150-180 credits.

It is desirable that the research is focused on a single problem throughout the whole educational period, but it is also possible to investigate different issues which have a common theme. The research is reported preferably in the form of articles in reputable scientific journals or contributions to recognized international scientific conferences. These form the main part of the licentiate thesis or dissertation.

The research is at least partly carried out in close collaboration with researchers at other universities, research institutes or industries, preferably abroad. The doctoral student will orally present the results from his/her research at recognized international conferences as well as at other functions. The research work will also regularly be presented to senior researchers at the department.

It is desirable that the student at the third-cycle level becomes actively involved in education at the first-cycle and second-cycle courses and study programmes and participates in courses in practical pedagogy.

An individual study plan is drawn up for every third-cycle student (according to a fixed template) in which the study programme for the individual student is specified in detail. A follow-up of the plan is held at by the third-cycle student and their supervisor and is approved by the head of department at least once a year, as delegated by the president of the university.



3 Eligibility and selection

3.1 General eligibility requirements

An individual fulfils the general eligibility requirements for the third-cycle educational programme when he or she 1) has completed a second-cycle degree, 2) has completed higher education courses worth at least 240 credits, of which at least 60 are for second-cycle courses, or 3) in some other manner, in this country or abroad, has acquired the equivalent qualifications. The faculty board may permit an exemption from the requirement of basic eligibility in the case of an individual applicant, if there are special grounds as written in Chapter 7, Section 39 of the Higher Education Ordinance (2010:1064). Information on this can also be found in the local guidelines laid down in the Admission Rules for Third-cycle Education at Luleå University of Technology.

3.2 Specific eligibility requirements

Good command of oral and written communication in English.

For applicants with general eligibility achieved before 2007-07-01: Degree of Master of Science in Engineering or Degree of Master of Science.

3.3 Selection

Selection among applicants meeting the requirements for the third-cycle education shall be made with reference to their ability to benefit from the education. The mere fact that an applicant is deemed able to receive credit towards the education for previous education or working activities may not alone give the applicant precedence over other applicants in the selection process, as per Chapter 7, Section 41 of the Higher Education Ordinance (2010:1064). Information on the selection process is also found in the local guidelines laid down in the Admission Rules for Third-cycle Education at Luleå University of Technology.

In the selection of third-cycle education in Electric Power Engineering the following applies to the selection criteria:

- Knowledge and skills relevant to the specific project
- The quality of the applicant's degree project
- Personal qualities relevant for third-cycle education.

4 Examinations included in the education

The education consists of courses and an academic thesis. Examinations included in third-cycle programmes are graded as either 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

It is mandatory to attend courses in scientific theory and in scientific writing. The remaining courses are, selected in consultation between the examiner, the supervisor and the student at the third-cycle level with the understanding that these courses form a good basis for the research work but also form good overview over the whole research area. The courses to be



included in the exam are decided in the individual study plan. Examination is conducted as an oral or written examination or through approved assignments.

Goal attainment is tested by means of the form of examination specified in the syllabus and the individual study plan.

4.1.1 Recognition of prior studies

As specified in the local guidelines laid down in the Admission Rules for Third-cycle Education at Luleå University of Technology.

4.2 Academic thesis

An academic project in the form of a licentiate or doctoral thesis in Electric Power Engineering shall be presented as a comprehensive summary of academic essays (composite thesis) that the third-cycle student has written alone or together with another person or persons.

The licentiate thesis is defended orally at a public licentiate seminar and is graded as either 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 as either 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 for a doctoral thesis is decided by a grading committee which is appointed specifically for each thesis.

5 Degree

In Electric Power Engineering, a third-cycle student who has been admitted to an examination for the Degree of Doctor has the possibility to take a Degree of Licentiate after completing one part comprising at least 120 credits of a study programme intended to conclude with the Degree of Doctor.

5.1 Degree objectives

As specified in the Qualifications Ordinance (Higher Education Ordinance, Annex 2 – Degree Ordinance). See also the Annex below.

5.2 Degree title

A third-cycle student who takes a Degree of Licentiate in Electric Power Engineering receives the degree title of Licentiate of Technology.

A third-cycle student who takes a Degree of Doctor in Electric Power Engineering normally receives the degree title of Doctor of Technology.

Requests for other degree titles are made according to established guidelines.



6 Entry into effect

General syllabus for Electric Power Engineering applies for admission of third-cycle students admitted after the date established in the general syllabus 2012-10-30 (dnr. 2138-11)



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 Degree of Doctor, 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 specialised 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:

- demonstrate the skills 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 skills 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 skills 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 skills to identify the personal need for further knowledge and take responsibility for his or her ongoing education.

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 as review and assess new and complex phenomena, issues and situations autonomously and critically
- demonstrate the skills to identify and formulate issues with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake research and other advanced tasks within predetermined time frames and to review and evaluate such work
- demonstrate through a dissertation the skills to make a significant contribution to the formation of knowledge through his or her own research
- demonstrate the skills 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 skills 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)