



Qualification descriptor for Degree of Master of Science (120 credits) - Major; Engineering Physics and Electrical Engineering

Teknologie Masterexamen - Huvudområde; Teknisk fysik och elektroteknik

Degree regulations of 2007
Second cycle

Specialisations

| Name | Start term | For admitted until |
|--|------------|--------------------|
| Embedded Systems (<i>Inbyggda system</i>) | A08 | |
| Signals and Systems (<i>Signaler och system</i>) | A08 | |
| Mechatronics (<i>Mekatronik</i>) | A08 | |

Established

Qualification descriptor approved on 2009-06-16 by Dekanus TFN.

Examination Objectives

Higher Education Act

English information is not available

Higher Education Ordinance

Annex 2

Knowledge and understanding

For a Master of Arts/Science (120 credits) the student shall have:

- * demonstrated knowledge and understanding in the main field of study, including both broad knowledge of the field and a considerable degree of specialised knowledge in certain areas of the field as well as insight into current research and development work, and
- * demonstrated specialised methodological knowledge in the main field of study.

Competence and skills

For a Master of Arts/Science (120 credits) the student shall have:

- * demonstrated the ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomena, issues and situations even with limited information
- * demonstrated the ability to identify and formulate issues critically, autonomously and creatively as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames and so contribute to the formation of knowledge as well as the ability to evaluate this work
- * demonstrated the ability in speech and writing both nationally and internationally to report clearly and discuss his or her conclusions and the knowledge and arguments on which they are based in dialogue with different audiences, and
- * demonstrated the skills required for participation in research and development work or autonomous employment in some other qualified capacity.

Judgement and approach

For a Master of Arts/Science (120 credits) the student shall have:

- * demonstrated the ability to make assessments in the main field of study informed by relevant disciplinary, social and ethical issues and also to demonstrate awareness of ethical aspects of research and development work
- * demonstrated insight into the possibilities and limitations of research, its role in society and the

responsibility of the individual for how it is used, and

* demonstrated the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

Detailed objectives for this degree

The student will after the training

- demonstrate ability to combine knowledge and skills from different scientific and technical disciplines.
- demonstrate ability to effectively use computers, software and measurement equipment in experimental and scientific work.
- demonstrate ability in writing and orally present technical or scientific problems and results for professionals and laymen.
- demonstrate knowledge and ability in project and project management.
- demonstrate basic skills for work in research and development within or between the areas of application electrical engineering, electronics, computer engineering, mechatronics, signal processing and embedded systems.
- demonstrate knowledge of how a long-term sustainable development of the area of electrical engineering is to be developed.

Specialisations

Embedded Systems

The student will after the training

- Demonstrate knowledge and ability to command and control projects within the subject of embedded systems engineering.
- Demonstrate knowledge and ability in terms of analysis, design, construction and programming of embedded systems.
- Be prepared to participate in advanced research work in the area of embedded system engineering.

Signals and Systems

The student will after the training

- Demonstrate knowledge and ability to command and control projects within the subject signalprocessing and/or automatic control
- Demonstrate knowledge and ability in terms of analysis, design and construction of signal processing and/or automatic control systems
- Be prepared to participate in advanced research work in signal processing and/or automatic control

Mechatronics

The student will after the training

- show knowledge and ability to command and control projects within an the mechatronic technical area
- show knowledge and ability regarding analysis, design and construction of mechatronic systems.
- be prepared to participate in advanced research in the area of mechatronics

Credits

The programme requires 120 credits.

The credits stated indicate the total for all courses leading to the degree. All courses are to have been completed and passed.

Special requirements

Higher Education Ordinance and Luleå University of Technology

Independent project (degree project)

A requirement for the award of a Master of Arts/Science (120 credits) is completion by the student of an independent project (degree project) for at least 30 credits in the main field of study. The degree project may comprise less than 30 credits, however no less than 15 credits, if the student has already completed an

independent project in the second cycle for at least 15 credits in the main field of study or the equivalent from a programme of study outside Sweden. (The Higher Education Ordinance, Annex 2 Qualifications ordinance)

Master of Arts/Science (60/120 credits) require a previous degree of Bachelor, Bachelor in fine arts or a professional degree of at least 180 credits or an equivalent foreign degree. (SFS 2006:1053, ch. 6, 5 § also appendix 2, Degree regulations)

A minimum of 90 credits of the education's 120 credits must consist of courses at second cycle level. A requirement for a Master's degree is that a main subject area has been formulated. (Riktlinjer för Bolognaanpassning (Guidelines for Bologna adaptation), LTU Dnr 783-06)

Detailed specific requirements for this degree

To obtain a Masters degree in electrical engineering it is required that the compulsory courses and the chosen thesis related elective courses are completed, see the course syllabus. The training includes a thesis of 30 ECTS. In this, the student shall individually, or together with another student, process a specific task and report the results, therein demonstrate their ability to apply the knowledge and skills acquired during studies. The thesis work should be performed at advanced level. To obtain a certain specialization, certain courses, specified in the curriculum, are required as well as a thesis subject related to the orientation. The following degree specializations/orientations are offered:

- Mechatronics
- Signals and Systems
- Embedded Systems

All course requirements for this degree are stated in the official syllabus.

Degree certificate

A degree certificate will be issued upon application to students who fulfil the requirements for a degree.

Course requirements for this degree

Syllabus - [Master Programme in Cybernetics](#) (*Utbildningsplan - Cybernetik, master*)

Syllabus - [Master Programme in Electrical Engineering](#) (*Utbildningsplan - Elektroteknik, master*)