



Qualification descriptor for Degree of Master of Science (120 credits) - Major; Mechanical Engineering

Teknologie Masterexamen - Huvudområde; Maskinteknik

Degree regulations of 2007
Second cycle

Specialisations

Name	Start term	For admitted until
Tribology (<i>Tribologi</i>)	A13	
Engineering Mechanics (<i>Teknisk mekanik</i>)		
Product Development (<i>Produktutveckling</i>)		
Wood Technology (<i>Träteknik</i>)		A12
Sustainable Energy (<i>Hållbar energiteknik</i>)		A08

Established

Qualification descriptor approved on 2010-03-15 by Ordförande TFN. Qualification descriptor updated on 2012-09-25 by Rektor.

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

- o demonstrate ability to combine knowledge and skills from different scientific and technical disciplines.
- o demonstrate ability to effectively use computers, software and measurement equipment in experimental and scientific work.
- o demonstrate ability in writing and orally present technical or scientific

Specialisations

Tribology

For specialization in Tribology the student shall

- demonstrate knowledge of research and development work in the subjects of mechanics, physics, mathematics and technical mechanics and the ability to use this knowledge to solve interdisciplinary tribological problems,
- demonstrate understanding and ability to develop solutions for typical tribology applications such as surface/interfaces, lubrication/lubricants, wear, and friction mechanisms (from nano- to macro-scale).

Engineering Mechanics

The student will after the training

- show ability in effective use of computers, programming and measurement technology in order to perform experiments and scientific work
- show ability to combine knowledge and skills from different scientific areas
- show knowledge about research and development in the areas of physics and mathematics applied in engineering mechanics

Product Development

The student will after the training

- show knowledge and ability regarding analysis, design and construction of mechanical systems.
- show knowledge and ability to develop solutions both using models and prototypes
- show knowledge and ability to analyse the performance of models and prototypes

Wood Technology

The student will after the training

- show knowledge and ability to understand, explain, predict and develop products made of wood
- show knowledge and ability to analyse the properties and performance of wood based products and wood manufacturing technology
- show knowledge regarding the material properties of wood at different scales, from individual cells to complete tree

Sustainable Energy

The student will after the training

- show ability in effective use of theories, computers, programming and measurement technology in order to perform experiments and scientific work and show ability to combine knowledge and skills from different scientific areas
- have ability to perform written and verbal presentations of technical or scientific problems and results for professionals and among laymen men and to have active experience of project work
- have a knowledge about research - and development works within practical energy technology and also, depending on direction, hydroelectric power or bioenergy

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

For a Masters degree in Mechanical Engineering (120 credits) of which at least 90 credits must be on the advanced level including a thesis of 30 credits. The subject of the thesis and as a minimum 75 credits must be within the specialization of the programme

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 Product Development](#) (Utbildningsplan - Produktutveckling, master)

Syllabus - [Master Programme in Engineering Mechanics](#) (Utbildningsplan - Teknisk mekanik, master)

Syllabus - [Master Programme in Wood Technology](#) (Utbildningsplan - Träteknik, master)

Syllabus - [Master programme in Tribology of Surfaces and Interfaces](#) (Utbildningsplan - Tribologi, master)