Qualification descriptor for Degree of Master of Science in Engineering, Space Engineering

Civilingenjörsexamen, rymdteknik

Degree regulations of 2007
Second cycle

Specialisations

Name	Start term	For admitted until
Space and Atmospheric Physics *(Rymdens och atmosfärens fysik)*	A07	
Spacecraft and Instrumentation *(Rymdfarkoster och instrumentering)*	A07	
Aerospace Engineering *(Flygteknik)*	A07	

Established

Qualification descriptor approved on 2008-03-27 by Ordförande Teknisk fakultetsnämnd. Qualification descriptor updated on 2016-09-06 by Enhetschef utbildnings- och forskningsenheten.

Examanition Objectives

Higher Education Act

English information is not available

Higher Education Ordinance

Annex 2

For a Master of Science in Engineering the student shall have demonstrated the knowledge and skills required to work autonomously as a graduate engineer.

Knowledge and understanding
For a Master of Science in Engineering the student shall have:
* demonstrated knowledge of the disciplinary foundation of and best practice in his or her chosen field of technology as well as insight into current research and development work, and
* demonstrated both broad knowledge of his or her chosen field of technology, including knowledge of mathematics and the natural sciences, as well as a considerable degree of specialised knowledge in certain areas of the field.

Competence and skills
For a Master of Science in Engineering the student shall have:
* demonstrated the ability to identify, formulate and deal with complex issues autonomously and critically and with a holistic approach and also to participate in research and development work and so contribute to the formation of knowledge
* demonstrated the ability to create, analyse and critically evaluate various technological solutions
* demonstrated the ability to plan and use appropriate methods to undertake advanced tasks within predetermined parameters
* demonstrated the ability to integrate knowledge critically and systematically as well as the ability to model, simulate, predict and evaluate sequences of events even with limited information
* demonstrated the ability to develop and design products, processes and systems while taking into account the circumstances and needs of individuals and the targets for economically, socially and ecologically sustainable development set by the community
* demonstrated the capacity for teamwork and collaboration with various constellations, and
* demonstrated the ability to present his or her conclusions and the knowledge and arguments on which they are based in speech and writing to different audiences in both national and international contexts.

Judgement and approach
For a Master of Science in Engineering the student shall have:
* demonstrated the ability to make assessments informed by relevant disciplinary, social and ethical aspects as well as awareness of ethical aspects of research and development work
* demonstrated insight into the possibilities and limitations of technology, its role in society and the responsibility of the individual for how it is used, including both social and economic aspects and also environmental and occupational health and safety considerations, and
* demonstrated the ability to identify the need for further knowledge and undertake ongoing development of his or her skills.

Detailed objectives for this degree

On completion of the education the student shall

- show the ability to independently combine knowledge and skills from different technical and natural science areas
- show the ability to effectively use computers, programs and measurement equipment for experimental and scientific work
- show the ability to present technical or science problems and results, in writing and by oral presentation, both in Swedish and in English, to professionals and laymen
- demonstrate knowledge and skill in project work and project management
- show basic skills for work within research and development in or between subject areas physics, mathematics, and basic techniques within space technology, electro technology, computer technology, environment technology, and aeronautical technology
- show knowledge about how a long-term sustainable development of the space technological subject area shall develop

It shall be possible to locate part of the education abroad in order to increase the students understanding of other cultures and broaden their communicative abilities.

Specialisations

Space and Atmospheric Physics

On completion of the education the student shall

- Demonstrate knowledge and capacity for management and control of projects within one of the areas atmospheric or space science
- Demonstrate advanced knowledge in analysis and use of/application of measurement equipment intended for measurement in atmospheric or space environment
- Be equipped for advanced research work within atmospheric and space physics

Spacecraft and Instrumentation

On completion of the education the student shall

- Demonstrate knowledge and capacity for management and control of project within an area of space technology
- Demonstrate advanced knowledge in analysis, design, and construction of measurement equipment intended for measurement in space environment
- Demonstrate broad knowledge in how a space craft is designed, navigated, and controlled

Aerospace Engineering

On completion of the education the student shall

- show knowledge and skill for management and control of project within an area of space and aeronautical technology
- show broad knowledge within the space and aeronautical technological subject area
- be able to analyze and simulate aeronautical technological questions concerning aerodynamics, performance, strength, aircraft engines, and avionics

- show knowledge about reliability, maintenance planning, and long term sustainable development within the aeronautical subject area

Credits

The programme requires 300 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 Science in Engineering is completion by the student of an independent project (degree project) for at least 30 credits. (The Higher Education Ordinance, Annex 2 Qualifications ordinance)

For the Master of Science in Engineering degree equivalent to 300 credits, it is a requirement that a minimum of 90 credits shall consist of courses at second cycle level. (Riktlinjer för Bolognaanpassning (Guidelines for Bologna adaptation), LTU Dnr 783-06)

Detailed specific requirements for this degree

In order to obtain Master of Science in Engineering, Space Engineering, it is required that the programs base courses, core courses, and that the eligible courses that are linked to each chosen direction are approved. A 30 ECTS master thesis is compulsory. Through this, the student individually or together with another student, will have treated a specific task and report on the result, thereby showing his/hers ability to apply the knowledge and skills that has been acquired during the study time. The master work shall be at advanced level. In order to obtain a certain direction written into the degree certificate, certain specified courses according to the study plan are demanded. The following exam directions are offered: Spacecraft and Instrumentation Space and Atmospheric Physics Aerospace Engineering All course requirements for this exam are stated in confirmed study plan, or alternatively in confirmed course specification list.

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

Degree certificate

Student that fulfills the demands for exam shall on his/her own request obtain 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 Space Engineering *(Utbildningsplan - Civilingenjör Rymdteknik)*