



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

Civilingenjörsexamen, väg- och vatten

Degree regulations of 2007
Second cycle

Specialisations

Name	Start term	For admitted until
Environmental Engineering (<i>Teknisk miljövård</i>)	A07	S14
Surveying (<i>Lantmäteri</i>)	A07	S14
Soil and Rock Engineering (<i>Jord- och bergbyggnad</i>)	A07	
Structural Engineering (<i>Konstruktion</i>)	A07	
Lean Construction (<i>Byggande</i>)	A07	

Established

Qualification descriptor approved on 2006-11-16 by Ordförande teknisk fakultetsnämnd. Qualification descriptor updated on 2010-12-03 by Chef Utbildnings- och forskningsenhet.

Examination 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

After completed education the student shall have:

- ability to independently obtain knowledge and to seek, value and refer to the same
- knowledge about and the ability in the logic, way of working and competence of construction and social plan
- knowledge in design, realization and direction of processes and products within the area of construction
- knowledge and ability in project work and project management
- ability to do reasonable judgements of own and other's work within the area of construction
- knowledge and ability in using modern engineer tools for planning and realization of processes and products within the area of construction
- knowledge about the conditions and problems of the building trade
- ability to develop products and to that connected problems within the area of construction
- knowledge about the working methods and profession of civil engineers in the plan and construction process

Specialisations

Environmental Engineering

After completed education the student shall have:

- knowledge about and ability to manage, lead and develop projects of environmental control (performance and construction)
- knowledge about and ability to plan and perform construction, operation and maintenance work within the environmental control sector (waste, water supply and sewerage, recipient control, renewable energy)

Surveying

After completed education the student shall have:

- knowledge about and ability to manage, lead and develop projects of surveying
- knowledge about and ability to use the juridical and technical basis within surveying
- knowledge about and ability to accomplish cadastral survey

Soil and Rock Engineering

The student shall have knowledge about

- and the ability to analyse and design soil and rock structures
- and the ability to plan and carry through the construction and the operation of soil and rock structures including mines
- the legislation and permission for soil and rock structures including mines
- and the ability for life cycle analyses of soil and rock structures including mines

Structural Engineering

Efter graduation, the student should have

- knowledge about and ability to analyse and design parts of building structures and whole systems
- knowledge about and ability to use applicable codes and standards when designing structural elements

- knowledge about and ability to lead and direct design work
- knowledge to find technical solutions regarding performance requirements (from architects), construction technics (contractor), life cycle perspective and sustainable development.

Lean Construction

After graduation the student should have:

- knowledge about and the ability to lead and direct construction projects with organizing and economic base
- knowledge about and the ability to plan and work out processes and objects within construction
- knowledge about demanded functions of a building and ability to transform such demands into technical solutions

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)

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 Civil Engineering](#) (*Utbildningsplan - Civilingenjör Väg- och vattenbyggnad*)