



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

*Teknologie Masterexamen - Huvudområde; Kemiteknik*

**Degree regulations of 2007**  
**Second cycle**

### Specialisations

Name	Start term	For admitted until
Minerals and Metallurgical Engineering ( <i>Mineralteknik och processmetallurgi</i> )	A07	
Chemical and Biochemical Engineering ( <i>Kemisk och biokemisk processteknik</i> )	A07	A11

### Established

Qualification descriptor approved on 2009-10-06 by Ordförande teknisk fakultetsnämnd. Qualification descriptor updated on 2010-11-23 by Chef utbildnings- och forskningsenheten.

### 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

For a Master of Science, Major in Chemical Engineering, the student shall be able to:

- Demonstrate advanced knowledge required for specialisation in applied engineering subjects, and the ability to provide broad technical knowledge within chemical engineering to serve as a basis for work with production, research and development within the process industry and research and development institutes belonging to the process industry or universities;
- Demonstrate the ability to efficiently use IT and measurement devices for experimental and scientific work, and to exercise the combination of knowledge and skills from different subjects;
- Demonstrate the ability to present technical and scientific problems and results, in writing and orally, for professionals and laypersons in both Swedish and in English;
- Demonstrate the ability to use computers for design and simulation of industrial processes;
- Demonstrate insight in engineering methodology including the identification, formulation and solving of problems given constraints in time and economic resources;
- Demonstrate the capacity for team work and provision for development of responsible leadership.

## Specialisations

### Minerals and Metallurgical Engineering

After completed education the student shall be able to:

- Demonstrate high-class knowledge of unit operations and processes for mineral winning and metal production;
- Demonstrate the ability to use computers to investigate statistical and process technology connections in industrial processes and to model, simulate and design them,
- Demonstrate the ability to acquire the knowledge to minimise energy consumption and resource utilisation, reducing the amount of green-house gases, eliminating dust emissions, and to apply these principles to sustainable mineral winning and metal production,
- Demonstrate the insight of demands and requirements for doctoral studies.

### Chemical and Biochemical Engineering

After completed education the student shall be able to:

- Demonstrate knowledge of unit operations and processes within biochemical and chemical engineering;
- Demonstrate the ability to present the knowledge about synthetic and biological catalysts, reactors and their use in industrial processes and environmental applications;
- Demonstrate the ability to design and optimise the equipment required for biochemical or chemical processes;
- Demonstrate the insight of demands and requirements for doctoral studies.

## 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)

*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 Chemical and Biochemical Engineering](#) (*Utbildningsplan - Kemiteknik, inr kemisk- och biokemisk processteknik, master*)

Syllabus - [Master Programme in Minerals and Metallurgical Engineering](#) (*Utbildningsplan - Kemiteknik, inr mineralteknik och processmetallurgi, master*)