Faculty of Technology and Science

PROGRAMME STUDY PLAN

Programme Code	TAMKT
Programme Approval	The Programme Study Plan was approved by the Faculty Board of Technology and Science on 25 October 2007 and is valid from the autumn semester of 2007 at Karlstad University.
Programme Title	Master of Science in Engineering, Degree Programme in Chemical Engineering
Credits	120 ECTS
Language of Instruction	English or Swedish
Degree Level	Master
Degree Type	Professional degree

Prerequisites

A Bachelor's degree of 180 ECTS cr. in Chemical Engineering, or equivalent, including the following:

- Mathematics 30 ECTS cr. covering basic one and multivariable calculus, introduction to vector analysis, ordinary and partial differential equations, linear algebra and numerical analysis and statistics.
- Basic Chemistry (min. 30 ECTS cr.) and Chemical Engineering (min. 40 ECTS cr.) totalling at least 90 ECTS cr.
- Basic engineering and natural sciences (min. 15 ECTS cr.) including mechanics.
- Course/s relevant to engineering 5 ECTS cr. in the humanities, social sciences or gender studies.

General Information

The aim of the study programme is that students acquire advanced qualifications in the field of chemical engineering with specialisation in pulp-based materials, their properties, manufacturing processes and fields of application. The focus is on all aspects of paper manufacturing from pulp to the production of printed matter and paper packages. The training is designed to provide qualifications for industrial development of pulp-based materials, production management and for doctoral studies. Mandatory components may be instructed in English.

Aims

Upon completion of the programme students should, beyond the general requirements for a Master's degree specified in the *Higher Education Ordinance, SFS* 2006:1053, be able to:

- demonstrate advanced knowledge in chemical engineering, especially in pulp and paper engineering, surface treatment and paper printing.
- provide a comprehensive view of how the choice of raw material and process conditions affect the properties of the product, energy consumption and paper materials,
- plan the use of appropriate test methods to characterize pulp, paper and print quality, and be able to analyse and interpret measurement values,
- demonstrate ability and experience of active participation in industrial research and development work in the field of wood-processing,
- demonstrate preparedness for and ability to work in a group and with others in international and interdisciplinary contexts,
- demonstrate preparedness to contribute to sustainable development, for instance, in choice of materials and processes.

Programme Structure
The programme runs over four terms, the last of which includes the degree project. Two of the first three terms consists of basic and advanced courses in pulp and paper engineering, and surface treatment and paper printing. Through realistic studies in close contact with industry students are expected to develop the competence needed to participate in academic or industrial research and development work in the field of wood-processing, or as a product manager. Courses and modules in the first three terms can be studied in a different order than recommended, provided the prerequisites for each course are met. Courses in environmental engineering of at least 7.5 ECTS cr. are mandatory for degree fulfilment. The degree project normally concludes the programme.

Programme Curriculum

Term 1
Courses in pulp and paper engineering plus surface treatment and paper printing (30 ECTS cr.) The aim is to provide sound knowledge of the manufacturing and use of paper, and of how the choice of raw material and process conditions affect the properties of paper products.

Term 2-3
Advanced courses in pulp and paper engineering, surface treatment and paper printing (30 ECTS cr.) plus elective courses in engineering or natural sciences (30 ECTS cr.). Terms 2-3 aim at providing opportunity for the students to develop their skills in carrying out research and development, which is why project management is a recommended elective. Students also have the opportunity to broaden or deepen their perspectives in the fields of engineering and/or the natural sciences, for instance, by choosing electives such as biochemical engineering, energy engineering or environmental engineering to suit their background and interests.

Term 4
Degree project, 30 ECTS cr.

Degree Title
Master of Science Major Chemical Engineering

Credit Transfer
According to the *Higher Education Ordinance* (Ch 6, § 12-14), students may transfer credits from previously completed university courses subject to approval. Transfer of credits for a course module, or university studies generally, is subject to the approval by the course examiner. Transfer of credits for a full course is subject to the approval by the Rector

Additional Information
Students who enrolled in the programme before 1 July 2007 will complete their studies in accordance with the requirements of the earlier curriculum. Upon completion

students may request degree and course certificates to be issued under the current ordinance if they meet its requirements.

Moving Up
In order to move up to the next level, students on the programme must have completed 45 ECTS cr. in the previous year. Students are not allowed to start working on their degree projects until they have completed 60 ECTS cr.

The local regulations for undergraduate studies at Karlstad University stipulate the obligations and rights of students and staff.