Programme syllabus

Master's Programme, Production Engineering and Management, 120 credits
Masterprogram, industriell produktion
120.0 credits

Valid for students admitted to the education from autumn 19 (HT - Autumn term; VT - Spring term).

This is a translation of the Swedish, legally binding, programme syllabus.

Programme objectives

In addition to the objectives specified in the Swedish Higher Education Ordinance, there are also specific objectives for this programme. Graduates from the programme shall

Knowledge and understanding

- have a broad scientific foundation that enables them to work within the field of production engineering
- have an understanding of how different variables interact in the multidisciplinary field that is production

Skills and abilities

- have the skills in presentation and communication required to achieve favourable conditions for effective work, both individually and in a group
- have the ability to use standard tools and techniques to solve problems within the field of production engineering
- have the ability to manage the collaboration between engineering and management roles
- be proficient in utilising modern modelling and simulation methods to support decisions
- have developed and deepened the analytical and reasoning skills needed to handle the ever-changing problems and challenges within the field of production engineering
- have the ability to analyse, synthesise and implement a production system
- demonstrate proficiency in analysing, formulating and handling technical and organisational problems within different production systems with regard to economic, social and environmentally sustainable conditions

Ability to make judgements and adopt a standpoint
• understand the central role of production engineering in development and competition in a global economy
• have developed a rational approach to energy-efficient processes and production systems
• have an understanding of how the environment and cultural differences affect the production process
• understand how requirements relating to sustainable development affect the production process
• understand that skills development is the basis of modern production

Extent and content of the programme

The programme comprises 120 credits, which corresponds to 2 years of full-time studies. The programme is in the second cycle and the language of instruction is mostly English.

Eligibility and selection

Eligibility for the Master's Programme in Production Engineering and Management requires a relevant university education of at least 180 credits, a Bachelor of Science in Engineering or a technical Degree of Bachelor within the subject area of Mechanical Engineering or equivalent. English skills equivalent to English B/English 6.

The selection process is based on the following criteria: university, credits awarded (e.g. grades, grades in specific subjects and English), motivation for the studies (for instance, letter of motivation, references, courses and relevant professional experience). The assessment of qualifications scale is 1-75.

Otherwise refer to the KTH admission regulations in the KTH regulatory framework, www.kth.se

Implementation of the education

Structure of the education

Academic year
Each academic year consists of two semesters which are 20 weeks each. Each semester is divided into two study periods.

Structure of the programme
During the first three semesters, the programme consists of compulsory courses, profile courses and optional courses.

The programme has four recommended profiles;
- Production Development
- Industrial IT Systems
- Production Engineering and Management
- Industrial Assembly

In addition to these, there is the possibility of combining the compulsory courses with other courses to create a personal student profile, which must be approved by the programme director.

The final semester's studies comprise a degree project.
Courses

The programme is course-based. Lists of courses are included in appendix 1.

The programme consists of compulsory, conditionally elective, recommended and optional courses.

The compulsory courses are defined for each year and track/profile in course lists. The goals, entrance qualifications, content and course requirements for each course can be found in the official course syllabuses.

The type of instruction and examination format vary between the courses and these are indicated in each official course syllabus.

The optional courses can be chosen from KTH's range of offered courses. Credits from courses at other universities/higher education institutions can also be transferred. The following limitations apply to the optional courses:

- there is a limit imposed on the number of credits that may be chosen per semester
- an optional course may not correspond to a significant extent to an existing programme course or an already credited course
- higher education preparatory courses may not be counted as optional courses
- optional courses may be chosen freely but should be relevant to the professional role of engineer

Grading system

Courses in the first and the second cycle are graded on a scale from A to F. A-E are passing grades, A is the highest grade. The grades pass (P) and fail (F) are used for courses under certain circumstances.

Grading scale is found in the course syllabus.

Conditions for participation in the programme

Participation requires admission to courses within the programme and course registration.

For studies at a higher study year there are specific admission requirements for the courses. Admission requirements are specified in the course syllabus.

Studies abroad

Students on the programme have the possibility of doing part of their education abroad. There is an exchange agreement with ParisTech in France which provides the opportunity for a double Degree of Master from both KTH and ParisTech. Similarly, students at ParisTech have an opportunity to undertake part of their studies at KTH within the Master's Programme in Production Engineering and Management. This also gives the opportunity for a double Degree of Master.

The application deadline for studies abroad is around 15 December for the following academic year.
**Degree project**

**Degree project, second cycle**
The programme includes a degree project for a Degree of Master that comprises 30 credits.

In order to fulfill specific admission requirements for a Degree Project, Second Cycle, 30 credits, courses corresponding to at least 60 credits, second cycle, must be completed. The courses at the second cycle shall include courses in the programme relevant to the degree project, as well as courses in science theory and research methodology.

**Degree**

**Conditions for a Degree of Master, 120 credits**

A Degree of Master of Science is obtained after completing the degree programme. The programme is designed so that the student, when they graduate, has fulfilled the national qualification requirements with a passing grade in all courses included in the student's study plan of 120 credits, of which

- at least 90 credits are attained in the second cycle, which includes at least 60 credits (including a 30 credit degree project) of specialised studies within the programme's main field of study.

**Title of general qualification at second cycle**
Degree of Master of Science (120 credits), Teknologie masterexamen

Appendix 1 - Course list
Appendix 2 - Programme syllabus descriptions
Appendix 1: Course list

Master's Programme, Production Engineering and Management, 120 credits (TPRMM), Programme syllabus for studies starting in autumn 2019

General courses

Year 1

Mandatory courses (30.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG2029</td>
<td>Production Engineering - Planning and Control</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2100</td>
<td>Scientific Methodology for Production Engineering</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2128</td>
<td>CAD and Other IT Tools in Industrial Processes, Extended Course</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2130</td>
<td>Modelling and Simulation of Industrial Processes</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

Conditionally elective courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD1320</td>
<td>Applied Computer Science</td>
<td>6.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>ME2053</td>
<td>Logistics &amp; Supply Chain Management</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG1007</td>
<td>Contemporary Maintenance Techniques</td>
<td>6.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>MG1010</td>
<td>Introductory Welding Technology, General Course</td>
<td>6.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>MG1011</td>
<td>Introductory Welding Technology, Advanced Course</td>
<td>6.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>MG1012</td>
<td>Non-Destructive Testing</td>
<td>3.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>MG2010</td>
<td>Modern Industrial Metrology</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2020</td>
<td>Modularisation of Products</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2022</td>
<td>Advanced CAD Modelling and Rapid Prototyping, Project Course</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td></td>
<td>CAD and Other IT Tools in Industrial Processes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MG2028 should be chosen by KTH civilingenjörer 6.0 hp Second cycle
MG2032 Automation Technology, Advanced Course 6.0 hp Second cycle
MG2033 Quality Control 6.0 hp Second cycle
MG2036 Computer Aided Manufacturing - CAM 6.0 hp Second cycle
MG2037 Industrial Adhesive Bonding 6.0 hp Second cycle
MG2103 Industrial Process Engineering 6.0 hp Second cycle
MG2104 Manufacturing Technology and Planning 7.5 hp Second cycle
MG2135 PLM - Product Lifecycle Management 9.0 hp Second cycle
MG2202 Quality Control, extended course 9.0 hp Second cycle

Supplementary information

Adaption courses (not for KTH civilining.)
MG2104 "Manufacturing Technology and Planning" 7.5cr.
MG2128 "CAD and other IT Tools in Industrial Processes, extended course" 7.5cr.

The Programme have four recommended profiles:

Industrial IT-systems
Conditionally elective courses for the profile:
DD1320 "Applied Computer Science" 6cr.
MG2022 "Advanced CAD modelling and Rapid Prototyping" 6cr.
MG2135 "PLM Product Lifecycle Management..." 9cr.
MG2036 "Computer Aided Manufacturing-CAM" 6cr.

Production Development
Conditionally elective courses for the profile:
MG2020 "Modularisation of Products" 6cr.
MG2032 "Automation Technology 1" 6cr.
and one of:
MG2033 "Quality Control" 6cr. (exclude statistics)
MG2202 "Quality Control" 9cr. (include statistics)

Production Engineering and Management
Conditionally elective courses for the profile:
MG2103 "Industrial Process Engineering" 6cr.
Two of the following courses should be choosen:
MG1007 "Contemporary Maintenance Techniques" 6cr.
MG2010 "Modern Industrial Metrology" 6cr.
MG2020 "Modularisation of Products" 6cr.
ME2053 "Logistics and Supply Chain Management" 6cr.
and one of:
MG2033 "Quality Control" 6cr. (exclude statistics)
MG2202 "Quality Control" 9cr. (include statistics)

Industrial Welding (only given in Swedish)
Conditionally elective courses for the profile:
MG2037 "Industrial Adhesive Bonding" 6cr.
MG1010 "Introductory Welding Technology, general course" 6cr.
MG1011 "Introductory Welding Technology, advanced course" 6cr.
MG1012 "None Destructive Testing" 3cr.

-------------------------------------------

MG2028 for students admitted to a 5 year engineering programme
MG2128 for students admitted to the 2 year Master programme

---------------------------------------------

NOTE: At least 5 conditionally elective courses should be taken during year 1 and 2.

Year 2

Mandatory courses (36.0 Credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Edu. Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG2027</td>
<td>Production Engineering - Project Course</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG213X</td>
<td>Degree Project in Production Engineering and Management,</td>
<td>30.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td></td>
<td>Second Cycle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conditionally elective courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Edu. Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME2053</td>
<td>Logistics &amp; Supply Chain Management</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2009</td>
<td>Advanced Manufacturing Technology</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2013</td>
<td>Advanced Welding Technology, Modulus 1</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2014</td>
<td>Advanced Welding Technology, Modulus 2</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2015</td>
<td>Advanced Welding Technology, Modulus 3</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2016</td>
<td>Enlarged Welding Technology for EWE/IWE</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2038</td>
<td>Digital Factories</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2109</td>
<td>Advanced Manufacturing Technology, Extended Course</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2110</td>
<td>Advanced Metrology</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

Supplementary information

The Programme have four recommended profiles:

Industrial IT-systems
Conditionally elective courses for the profile:
MG2038 "Digital factories" 6cr.
Production Development
Conditionally elective courses for the profile:
ME2053 "Logistic Supply Chain Management" 6cr.
and one of:
MG2009 "Advanced Manufacturing Technology" 6cr.,
MG2109 "Advanced Manufacturing Technology, Extended course" 9cr. or
MG2110 "Advanced Metrology" 9cr.

Production Engineering and Management
Conditionally elective courses for the profile:
one of:
MG2109 "Advanced Manufacturing Technology, extended course" 9cr.
MG2110 "Advanced Metrology" 9cr.

Industrial Welding (only given in Swedish)
Conditionally elective courses for the profile:
MG2013 "Advanced Welding Technology modulus 1", 6hp.
MG2015 "Advanced Welding Technology, modulus 3" 6hp.
MG2016 "Enlarged Welding Technology for EWE/IWE", 6hp.

At least 5 conditionally elective courses should be taken during year 1 and 2.
Appendix 2: Specialisations

Master's Programme, Production Engineering and Management, 120 credits (TPRMM), Programme syllabus for studies starting in autumn 2019

This programme has no specialisations.