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 16 (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

The KTH local Degree Ordinance can be found in the KTH regulatory framework. www.kth.se.

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

The academic year comprises 40 weeks and is divided into four periods. If necessary, instruction may be provided outside the parameters of the academic year.

The division of the academic year is presented on the KTH student web www.kth.se

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 is structured in the form of courses. Course lists are found 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.

Conditions for participation in the programme

Semester registration

At the beginning of the semester, the student must submit a compulsory semester registration via their personal login at www.kth.se

Semester registration is required to take new courses and for credits awarded to be reported, and for any payments of student aid to be made by CSN.

Application for courses within the programme

Prior to each semester, the student must apply for all courses the student intends to take. Course application is done at www.antagning.se or www.universityadmissions.se

- 1 - 15 May for autumn semester
1 - 15 November for spring semester

If the student does not apply via www.antagning.se or www.universityadmissions.se, the application is only considered subject to availability.

The student can obtain information on how to apply from the school's office of student affairs.

**Course registration**
At course start, the student must register themselves on all courses. Course registration must be done individually, either via the student's personal login at www.kth.se or according to instructions from the school offering the course.

A person who has registered on a course, but has subsequently decided not to proceed with the course, must inform the school offering the course as soon as possible, according to the school's instructions.

Course registration requires that the student has been admitted to the course.

**Conditions for studies in year 2**
At least 45 credits from year 1, according to the course list of the programme syllabus, shall be earned by the end of the re-examination period in August.

**Approved leave from studies**
Approved leave from studies means that the student does not participate in the teaching for at least one study period. Approved leave from studies entitles the student to return to the studies at a specified time. During their approved leave from studies, the student may engage in supplementary tasks and participate in the examination of previously commenced courses.
Applications for approved leave from studies are made using a form that is submitted to the school's office of student affairs. When a student intends to resume their studies, they should submit a new study application according to instructions from the school's office of student affairs.
For more information, see the KTH regulatory framework, www.kth.se

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- 1 - 15 May for autumn semester
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Course registration requires that the student has been admitted to the course.
Conditions for studies in year 2
At least 45 credits from year 1, according to the course list of the programme syllabus, shall be earned by the end of the re-examination period in August.

Individual study plan
A student who does not fulfil the above requirements must, in consultation with the programme study advisor, establish an individual study plan for the continuing studies.
There are no guaranties for full-time studies for students with an individual study plan.
More information at KTH regulatory framework: www.kth.se

Recognition of previous academic studies
Students have the opportunity to apply to be given credit for results from a course or courses at another higher education institution/university within or outside the country. The entire KTH policy for credit transfer is included in KTH's regulatory framework, www.kth.se

As the grading systems differ widely between countries, grades from exchange studies are not translated to the KTH grading scale

An application is made by submitting a form to the school's office of student affairs.

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 and which is usually done during spring semester of year 2.

Commencement of the degree project requires that the majority of the studies in the Master's Programme are completed, i.e.,

- that 60 credits have been obtained, of which 30 credits relate to specialised studies in the second cycle within the Master's Programme.

KTH's comprehensive rules and guidelines for a degree project, 30 credits, for a Degree of Master, 120 credits, can be found in the KTH regulatory framework. www.kth.se

Degree
Application for a certificate
The student must apply for a certificate. Applications are made by logging on to the KTH website where "Applications for degrees" is found under the heading Programme.

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)
Teknologe masterexamen

Refer to the KTH guidelines (KTH regulatory framework), local directions for higher education qualifications at first and second cycle, the local Degree Ordinance www.kth.se

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 2016

General courses

Year 1

Mandatory courses (28.5 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG2028</td>
<td>CAD and Other IT Tools in Industrial Processes</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<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>MG2130</td>
<td>Modelling and Simulation of Industrial Processes</td>
<td>9.0 hp</td>
<td>Second cycle</td>
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</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>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>None Destructive Testing</td>
<td>3.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Profile</td>
<td>Credits</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>MG2010</td>
<td>Modern Industrial Metrology</td>
<td>Production Engineering and Management</td>
<td>6.0 hp</td>
</tr>
<tr>
<td>MG2013</td>
<td>Advanced Welding Technology, Modulus 1</td>
<td>Industrial Welding</td>
<td>6.0 hp</td>
</tr>
<tr>
<td>MG2014</td>
<td>Advanced Welding Technology, Modulus 2</td>
<td>Industrial Welding</td>
<td>6.0 hp</td>
</tr>
<tr>
<td>MG2015</td>
<td>Advanced Welding Technology, Modulus 3</td>
<td>Industrial Welding</td>
<td>6.0 hp</td>
</tr>
<tr>
<td>MG2016</td>
<td>Enlarged Welding Technology for EWE/IWE</td>
<td>Industrial Welding</td>
<td>6.0 hp</td>
</tr>
<tr>
<td>MG2020</td>
<td>Modularisation of Products</td>
<td>Production Engineering and Management</td>
<td>6.0 hp</td>
</tr>
<tr>
<td>MG2022</td>
<td>Advanced CAD Modelling and Rapid Prototyping, Project</td>
<td>Industrial IT-systems</td>
<td>6.0 hp</td>
</tr>
<tr>
<td>MG2032</td>
<td>Automation Technology, Advanced Course 1</td>
<td>Production development (can be chosen in year 2)</td>
<td>6.0 hp</td>
</tr>
<tr>
<td>MG2033</td>
<td>Quality Control</td>
<td>Production development, Production engineering and management. MG2033 or MG2202 must be taken. If you don't have knowledge in statistics you must take MG2202</td>
<td>6.0 hp</td>
</tr>
<tr>
<td>MG2036</td>
<td>Computer Aided Manufacturing - CAM</td>
<td>Industrial IT-systems</td>
<td>6.0 hp</td>
</tr>
<tr>
<td>MG2103</td>
<td>Industrial Process Engineering</td>
<td>Production Engineering and Management</td>
<td>6.0 hp</td>
</tr>
<tr>
<td>MG2104</td>
<td>Manufacturing Technology and Planning</td>
<td>Production Engineering and Management</td>
<td>7.5 hp</td>
</tr>
<tr>
<td>MG2128</td>
<td>CAD and Other IT Tools in Industrial Processes, Extended</td>
<td>Course</td>
<td>OBS! not for KTH M.Sc students</td>
</tr>
<tr>
<td>MG2135</td>
<td>PLM - Product Lifecycle Management</td>
<td>Industrial IT-systems</td>
<td>9.0 hp</td>
</tr>
<tr>
<td>MG2202</td>
<td>Quality Control, extended course</td>
<td>Production development, Production engineering and management. MG2033 or MG2202 must be taken. If you don't have knowledge in statistics you must take MG2202</td>
<td>9.0 hp</td>
</tr>
</tbody>
</table>

**Supplementary information**
The Programme have four recommended profiles:

- Industrial IT-systems
- Production development
- Production engineering and management
- Industrial Welding

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

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, Second Cycle</td>
<td>30.0 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>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>MG2037</td>
<td>Industrial Adhesive Bonding</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.
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:
MG2037 "Industrial Adhesive Bonding" 6cr.

**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 2016

This programme has no specialisations.