Programme syllabus

Master's Programme, Sustainable Production Development, 120 credits
Masterprogram, hållbar produktionsutveckling
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

Based on the objectives specified in the Higher Education Ordinance, the overall objectives of the master’s program Sustainable Production Development are described below.

Knowledge and understanding

A graduate from the master’s programme shall:

• Demonstrate knowledge and understanding within mechanical engineering and sustainable production development, its scientific base and proven experience within these areas.
• Demonstrate broad knowledge within mechanical engineering and deeper knowledge of sustainable production development, focusing on production management, production logistics and industrial dependability. This includes general design and development, analysis, operation, and optimization of production systems.
• Demonstrate insight into current research and development work within these areas.
• Demonstrate in-depth knowledge within methodology in mechanical engineering and sustainable production development.

Skills and abilities

A graduate from the master’s programme shall:

• Demonstrate the ability to critically, independently and creatively identify, formulate and manage complex issues with a holistic viewpoint.
• Demonstrate the ability to plan and adequately implement qualified tasks within the given scope.
• Demonstrate the skills required to participate in research and development work and thereby contribute to the development of knowledge, or to independently work in other qualified engineering activities and to evaluate this work.
• Demonstrate the ability to critically and systematically integrate knowledge as well as demonstrate ability to analyse, assess and manage complex phenomena, issues and situations, even with limited information.
• Demonstrate the ability to teamwork and collaborate in groups of different composition.
• Demonstrate the ability, in both national and international contexts, to express and discuss in a clear and written manner conclusions and the knowledge and arguments that underlie them in dialogue with different groups.

Ability to make judgements and adopt a standpoint

A graduate from the master’s programme shall:

• Demonstrate the ability to make assessments in the field of mechanical engineering and sustainable production development with regard to relevant scientific, social and ethical aspects as well as show awareness of ethical aspects in research and development.
• Demonstrate insight into the possibilities and limitations in science, in general and more specifically in sustainable production development, its role in society and people's responsibility for how it is used, including social and economic aspects, and environmental and work environment aspects.
• Demonstrate the ability to identify his/her need for additional knowledge and to take responsibility for his/her ongoing knowledge development.

**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 English.

**Eligibility and selection**

Eligibility for the Master's Programme in Sustainable Production Development requires general entry requirements corresponding of:

- a Bachelor of Science within engineering of at least 180 credits, or an equivalent qualification.
- English skills equivalent to English B/English 6.

Required special qualifications are a technical bachelor’s degree with specialisation in one of the fields: mechanical engineering, industrial engineering, supply chain management, industrial management, design and product development, vehicle engineering, sustainable development, information and communication technology, computer science and engineering, or corresponding field.

A basic course in industrial engineering including systems engineering, production systems and operations management, is however required to fulfil the specific requirements.

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**

The programme starts with compulsory package of courses that gives a solid base within the area of Mechanical Engineering and Sustainable Production Development.

The following two semesters consists of compulsory courses and optional courses.

The final semester's studies comprise a degree project.

**Courses**

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

The compulsory courses are defined for each year. 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 varies 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

**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**

Participation requires admission to courses within the programme and course registration. Course registration is done via the personal menu at www.kth.se

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

**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 the course to which they have been admitted. 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.

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, preferably during the second semester, spring semester year one.

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.

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.

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) Teknologie masterexamen

Optional preparatory courses and introductory courses cannot be included as part of the degree.

Courses whose content overlaps one or more other courses in the programme cannot be counted as part of the 120 credits that form the basis for the degree.

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, Sustainable Production Development, 120 credits (TITHM), Programme syllabus for studies starting in autumn 2019

General courses

Year 1

Mandatory courses (48.0 credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML2300</td>
<td>Sustainable Production</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>ML2301</td>
<td>Production Management and Development</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>ML2302</td>
<td>Modelling, Simulation and Optimization of Sustainable Production</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>ML2303</td>
<td>Digitalisation for Sustainable Production</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>ML2305</td>
<td>Production Logistics and Supply Chains</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>ML2306</td>
<td>Industrial Analytics for Advanced Manufacturing</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

Optional courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML2304</td>
<td>Sustainable Development in Industry</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

Supplementary information

- Sustainable production 9.0 hp
- Production management and development 9.0 hp
- Modelling, simulation and optimization of sustainable production 9.0 hp
- Digitalisation for sustainable production 9.0 hp
- Industrial analytics for advanced manufacturing 6.0 hp
- Production logistics and supply chains 6.0 hp
- Sustainable development in industry 6.0 hp
- Elective course 6.0 hp

Based upon the curriculum for academic year 2019/2020. Changes may occur.
Year 2

Supplementary information

• CDIO project in Sustainable production development, 9 hp
• CDIO, continue course, 6 hp
• Theory of science and research methodology in Sustainable production development, 6 hp
• Thesis work, 30 hp
• Elective course, 9 hp

Based upon the curriculum for academic year 2019/2020. Changes may occur.
Appendix 2: Specialisations

Master's Programme, Sustainable Production Development, 120 credits (TITHM), Programme syllabus for studies starting in autumn 2019

This programme has no specialisations.