Programme syllabus

Master's Programme, Integrated Product Design, 120 credits
Masterprogram, integrerad produktdesign
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

Integrated Product Design (IPD) is a two-year Master's Programme with the goal of training engineers who, in today's highly competitive and fast changing global market, require advanced knowledge and highly developed skills in how to develop competitive and sustainable products in multidisciplinary teams.

Knowledge and understanding

Graduates from Integrated Product Design shall, within the area of industrial design engineering or the organisation and management of innovation and product development:

- demonstrate knowledge of the fields' scientific foundation and proven experience
- demonstrate in-depth insight into current research and development
- demonstrate advanced methodological knowledge

Skills and abilities

Graduates from Integrated Product Design shall, within the area of industrial design engineering or the organisation and management of innovation and product development:

- demonstrate the ability to search for, gather and integrate knowledge and identify their need for additional knowledge while applying a holistic, critical and systematic approach
- demonstrate the ability to identify, analyse, assess and handle complex phenomena, issues and situations, even with limited information
- demonstrate the ability to plan and, using adequate methods, carry out skilled tasks within a given timeframe and evaluate this work
- demonstrate the ability to develop and evaluate products, systems, methods or technical solutions with respect to people's circumstances and needs, as well as society's goals in terms of economically, socially and ecologically sustainable development
- demonstrate the capacity, both orally and in writing, in dialogue with different groups, to clearly account for and discuss their conclusions and the knowledge and arguments on which these are based
- demonstrate the ability to make assessments with regard to relevant scientific, societal and ethical aspects
- demonstrate the skill required to participate in research and development work or to work independently in other advanced contexts
- demonstrate the ability to take responsibility for planning and organising, and implement innovative product development projects in teams
Ability to make judgements and adopt a standpoint

- demonstrate the ability to make assessments of the possibilities and limitations of technology with respect to relevant scientific, environmental, human, societal, ethical and economic aspects
- demonstrate initiative and innovation in utilising the extraordinary opportunities technology brings in order to create a more humane and sustainable society
- have a good understanding of the inherent complexity of technical systems and of the fact that the process of developing them is often incompletely defined and involves conflicting requirements and expectations
- demonstrate the ability to identify their need of further knowledge and to continuously develop their skills

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.

The programme level is primarily second cycle, and within the programme the student specialises within one of two different areas: industrial design engineering or the organisation and management of innovation and product development. This means that the programme is divided into two tracks, one of which is to be specified as the student's intended specialisation in their application:

- Industrial Design Engineering
- Innovation Management and Product Development

Eligibility and selection

Eligibility for both tracks (Industrial Design Engineering and Innovation Management and Product Development) within the Master's Programme Integrated Product Design requires a relevant Higher Education Diploma of at least 180 ECTS credits, within Mechanical Engineering or equivalent. General requirements include: Mechanical Engineering: Mechanics, Solid Mechanics, Thermodynamics, Electrical Engineering, Machine Elements, Manufacturing Technology, 3D-CAD, Product Development and Engineering Design.

Applicants to the Industrial Design Engineering Track must also have good knowledge in Industrial Design Engineering: Ergonomics, Design Processes, Materials, Sketching, Rapid Prototyping, and Digital 3D-visualisation. English 6/B.

In addition to the above, eligibility for the track Industrial Design Engineering also requires the following knowledge within both mechanical engineering and industrial design:

- Mechanical engineering: mechanics, solid mechanics, thermodynamics, electrical engineering, machine elements, manufacturing technology, 3D-CAD, product development and engineering design.
- Industrial design: ergonomics, the design process, material selection, sketching, rapid prototyping and digital 3D visualisation.

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
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

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 if the qualification requirements are met.

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
Participation requires admission to courses within the programme and course registration. Course registration is done via 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 all courses. Course registration must be done individually, either via the student's personal login at www.kth.se or pursuant 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.

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 the KTH 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
The degree project can be done outside of Sweden after approval from the examiner. 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.

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

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, Integrated Product Design, 120 credits (TIPDM), Programme syllabus for studies starting in autumn 2019

Track, Industrial Design Engineering (IPDC)

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>MF2032</td>
<td>Eco Design</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MF2038</td>
<td>Service Design</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MF2086</td>
<td>Research Methodology in Management and Organization</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td></td>
<td><em>Alt. can MF2072 be chosen in year 2, period 2</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MF2101</td>
<td>Machine Design</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MF2102</td>
<td>Machine Design Project Course</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MF2104</td>
<td>Mechatronic in Product Design</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MF2112</td>
<td>Advanced Product Design</td>
<td>12.0</td>
<td>Second cycle</td>
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</tbody>
</table>

Supplementary information

MF2086 is mandatory alt. can MF2072 be chosen in year 2, period 2

Year 2

Mandatory courses (42.0 credits)

<table>
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<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MF2061</td>
<td>Industrial Design Engineering Advanced Course, Part 2</td>
<td>12.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MF227X</td>
<td>Degree Project in Industrial Design Engineering, Second Cycle</td>
<td>30.0</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>Course code</td>
<td>Course name</td>
<td>Credits</td>
<td>Edu. level</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------------</td>
<td>---------</td>
<td>------------</td>
</tr>
<tr>
<td>MF2072</td>
<td>Research Methodology in Machine Design</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td></td>
<td>Should be chosen if you did not take MF2086 in year 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Supplementary information**

Course list: Information is based upon the curriculum for academic year 2019/2020. Changes may occur.

MF2086 is mandatory alt. can MF2072 be chosen in year 2, period 2

**Year 3**

**Track, Innovation Management and Product Development (IPDE)**

**Year 1**

Mandatory courses (45.0 credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MF2011</td>
<td>Systems Engineering</td>
<td>9.0</td>
<td>Second cycle</td>
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<tr>
<td>MF2046</td>
<td>Product Innovation</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MF2084</td>
<td>Managing Research and Development</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MF2085</td>
<td>Innovation- and Product Development Processes</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MF2086</td>
<td>Research Methodology in Management and Organization</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MF2101</td>
<td>Machine Design</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MG2020</td>
<td>Modularisation of Products</td>
<td>6.0</td>
<td>Second cycle</td>
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</table>

**Supplementary information**

Course list: Information is based upon the curriculum for academic year 2018/2019 Changes may occur.

(MF2101 replaces MF2006)

**Year 2**

Mandatory courses (60.0 credits)

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<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MF2087</td>
<td>Innovation Management - Theory and Practice</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MF2088</td>
<td>Innovation and Product Development</td>
<td>22.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MF230X</td>
<td>Degree Project in Innovation Management and Product Development, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>
Supplementary information

Course list: Information is based upon the curriculum for academic year 2018/2019
Changes may occur.

Year 3
Appendix 2: Specialisations

Master's Programme, Integrated Product Design, 120 credits (TIPDM), Programme syllabus for studies starting in autumn 2019

Track, Industrial Design Engineering (IPDC)

Track, Innovation Management and Product Development (IPDE)