



Programme syllabus

[An accessible version of the syllabus can be found in the Course and programme directory.](#)

Degree Programme in Design and Product Realisation 300 credits

Civilingenjörsutbildning i design och produktframtagning

Valid for students admitted to the education from autumn 21 (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, a graduate Master of Science in Engineering from Design and Product Realisation at KTH shall ...

Knowledge and understanding

- possess extensive knowledge of the product realisation process so as to be able to produce products that are tailored to people, technology and society. This includes, for example, material selection, energy sources, production methods, assessment of economic and environmental impact, etc.

- have a good grounding in natural and engineering sciences with a second-cycle specialisation within one area of application within the chain: design – construction – production, all with a life-cycle perspective.

Skills and abilities

- have the ability to combine and transform the traditional natural and engineering sciences foundation in the education to construction and design aspects as a basis for the development of attractive products and services
- possess the requisite personal and professional skills, such as in the area of language, leadership, project management and communication, to work as an engineer in a management position or as a leader within a technology-intensive company
- have significantly developed their own innovative capability through design thinking and creative methods as a complement to the analytical approach

Ability to make judgements and adopt a standpoint

- Have especially good understanding that engineering-related problems, considered from a system perspective, are often complex, incompletely defined and sometimes contain contradictions
- Show an understanding of responsibility and ethics relevant for all steps in the product realization process, e.g. design – construction – production/manufacturing and utilization.

Extent and content of the programme

The Degree Programme in Design and Product Realisation comprises 300 higher education credits, which corresponds to 5 years of full-time studies at a normal study pace (10 semesters).

The programme's first three years (180 credits) are primarily first cycle.

During the two final years (120 credits), the student undertakes a Master's programme. Master's programme courses are conducted primarily in the second cycle.

The academic year 2021/2022 offers the following Master's programmes for a Degree of Master of Science in Design and Product Realisation *

- Integrated Product Design
- Production Engineering and Management
- Engineering Design
- Industrial Management
- Sustainable Energy Engineering

- Aerospace Engineering
- Vehicle Engineering
- Naval Architecture
- Engineering Mechanics

* The range of offered Master's programmes may be revised. An updated list of elective Master's programmes can be found on the KTH student web for each respective academic year.

Language of instruction

The language of instruction for the first three years of first cycle is mainly Swedish, and the language of instruction in the second cycle for the final two years is mostly English.

Eligibility and selection

Admission to the Degree Programme in Design and Product Realisation requires the general entry requirements for higher education, and also special admission requirements as follows:

Upper-secondary education before 1 July 2011 and upper-secondary adult education before 1 July 2012

Field-specific entry requirement 9

Specific admission requirements corresponding to:

Mathematics E, Physics B and Chemistry A.

In each of the subjects, a minimum grade of Pass or 3 is required.

Upper-secondary education from 1 July 2011 and upper-secondary adult education from 1 July 2012 (Gy11/Vux12)

Field-specific entry requirement A9

Specific admission requirements corresponding to:

Mathematics 4, Physics 2 and Chemistry 1.

A grade of E is required as a minimum in each of the subjects.

Implementation of the education

Structure of the education

Academic year

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

Years 1-3, studies at first cycle

The programme syllabus consists of the compulsory foundation block in the years 1-3 in the first cycle, and also of a Master's programme in the second cycle, years 4 and 5, which concludes with a degree project of 30 credits.

The programme is organised around courses in applied subjects relating to mathematics, engineering science and technology. The teaching and use of professional skills and abilities of great importance to a certified engineer, for example, communication, project work, systems thinking, ethics, entrepreneurship, sustainable development, corporate and societal aspects, are integrated into the courses.

To create a unified whole, the programme emphasises cooperation between different subjects, both within a specific year and between years. This is achieved, inter alia, through the programme-specific courses including project assignments where knowledge gained from other courses is integrated and applied in a product realisation perspective.

Mathematical natural science courses

This block contains basic courses in mathematics and natural science and is chiefly located in year 1 and year 2.

Technology courses

This block includes basic engineering science courses within the field of mechanical engineering, such as solid mechanics, thermodynamics, engineering materials and production. This block is begun in year 1 and concluded in year 3.

The first 3 years conclude with a degree project for a Degree of Bachelor worth 15 credits within a chosen technical field.

Years 4-5 in the second cycle

The Master's programmes consist mainly of advanced courses and a degree project within one and the same engineering science discipline. Students on the Degree Programme in Design and Product Realisation can choose from a wide range of Master's programmes with programme syllabuses established in advance. There is no restriction on the number of places on these Master's programmes for students on the Degree Programme in Design and Product Realisation.

Professional skills and abilities in, for example, entrepreneurship, engineering skills and innovation, are deepened in the engineering courses in years 4 and 5, where labour market links are also of great importance for the final degree project.

The engineer's knowledge of the environment and sustainable development is deepened and concretised through integrating the special aspects of, for example, life-cycle analysis, environmental impact and material selection, which are characteristic of the chosen Master's programmes, in the programme's courses.

Elective Master's programmes that lead to a Degree of Master of Science in Engineering are found under the heading "Scope and content of the programme".

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

The forms of teaching and examination vary between courses. 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 optional courses:

- Optional courses may not be taken in year 1.
- 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 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.

The 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 further studies, special admission requirements for the course are to be fulfilled. Special admission requirements are listed in the respective course syllabus.

Choice of Master's programme

Prior to year 4/ Master's programme year 1, second cycle, the student chooses a Master's programme within the framework of their Degree Programme.

Choice of Master's programme is made by the students within the Degree Programme according to instructions from the KTH admissions office.

Admission requirements for Master programmes

In order to be eligible for second cycle studies within KTH:s Master of Science programmes, 165 credits are required from year 1-3, of which at least 110 credits from year 1 - 2. A degree project, first cycle, must be completed before the studies on the master's program commence. Possible additional special admission requirements exist and appear in the respective programme syllabus.

Degree project

Degree Project, First Cycle

Within the degree programme a degree project, first cycle, which comprises 15 credits, is included. The degree project course can be commenced when the special admission requirements listed in the course syllabus are met.

Degree project, Second Cycle

Within the degree programme a degree project, second cycle, which comprises 30 credits, is included. The degree project course forms the final part of the degree programme. The degree project course can be commenced when the special admission requirements listed in the course syllabus are met.

Degree

In order to complete a Degree in Master of Science in Engineering, Degree Program Design and Product Realisation, requires an approved grade in all courses included in the students study plan based on the degree programme. The study plan shall comprise 300 credits, which includes a degree project, first cycle comprising 15 credits and a degree project, second cycle comprising 30 credits.

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

Courses whose content is similar to one or more other courses within the programme cannot be counted as part of the 300 credits that form the basis for the degree.

Optional courses will contribute to the degree programme objectives of Design and Product Realisation and the professional role.

The student has the possibility of applying for the following three degree:

Title of general qualification at first cycle

Bachelor of Science (180 credits)

Teknologie kandidatexamen

Title of professional qualifications at second cycle

Master of Science in Engineering

Civilingenjörsexamen

Title of general qualification at second cycle

Master of Science (120 credits)

Teknologie masterexamen

Appendix 1 - Course list

Appendix 2 - Programme syllabus descriptions



Appendix 1: Course list

Degree Programme in Design and Product Realisation (CDEPR)

General courses

Year 1

Mandatory courses (60.0 Credits)

| Code | Name | Credits | Edu. level |
|------------------------|---|---------|-------------|
| MF1061 | Introduction to Design and Product Realisation | 9.0 hp | First cycle |
| MF1062 | Design and Product Realization | 6.0 hp | First cycle |
| SF1522 | Numerical Computations | 6.0 hp | First cycle |
| SF1523 | Analytical and Numerical Methods for Differential Equations | 7.5 hp | First cycle |
| SF1624 | Algebra and Geometry | 7.5 hp | First cycle |
| SF1625 | Calculus in One Variable | 7.5 hp | First cycle |
| SF1626 | Calculus in Several Variables | 7.5 hp | First cycle |
| SG1130 | Mechanics I | 9.0 hp | First cycle |

Year 2

Mandatory courses (60.0 Credits)

| Code | Name | Credits | Edu. level |
|------------------------|--|---------|-------------|
| MF1039 | Design and Product Realization, Components | 6.0 hp | First cycle |
| MF1063 | Materials in Design and Product Realisation | 9.0 hp | First cycle |
| MF1064 | Modelling and Simulation in Design and Product Realization | 9.0 hp | First cycle |
| MG1016 | Manufacturing Technology | 6.0 hp | First cycle |
| MJ1112 | Applied Thermodynamics | 9.0 hp | First cycle |
| SD1116 | Design of Silent and Vibration-free Products | 6.0 hp | First cycle |
| SE1020 | Solid Mechanics, Basic Course | 9.0 hp | First cycle |
| SG1140 | Mechanics II | 6.0 hp | First cycle |

Recommended courses

| Code | Name | Credits | Edu. level |
|------------------------|--|---------|-------------|
| MF1018 | Industrial Design Prep <i>Only for/mandatory for students admitted from COPEN</i> | 3.0 hp | First cycle |
| MG1028 | Introductory 3D CAD <i>Mandatory for students admitted from COPEN</i> | 1.5 hp | First cycle |

Supplementary information

The course list is based upon the curriculum for academic year 2021/2022. Changes may occur.

Information regarding conditionally elective courses

The courses MF1018 samt MG1028 are only to be read and mandatory for students admitted to CDEPR from Degree Programme Open Entrance (COPEN)

Year 3

Mandatory courses (24.0 Credits)

| Code | Name | Credits | Edu. level |
|------------------------|--|---------|-------------|
| ME1003 | Industrial Management, Basic Course | 6.0 hp | First cycle |
| MF1016 | Basic Electrical Engineering | 9.0 hp | First cycle |
| MF1040 | Design and Product Realization Methodology | 9.0 hp | First cycle |

Conditionally elective courses

| Code | Name | Credits | Edu. level |
|------------------------|---|---------|-------------|
| MF130X | Degree Project in Machine Design, First Cycle | 15.0 hp | First cycle |
| MF131X | Degree Project in Integrated Product Development, First Cycle | 15.0 hp | First cycle |
| MF132X | Degree Project in Industrial Design Engineering, First Cycle | 15.0 hp | First cycle |
| MF133X | Degree Project in Mechatronics, First Cycle | 15.0 hp | First cycle |
| MG110X | Degree Project in Production Engineering, First Cycle | 15.0 hp | First cycle |
| MJ146X | Degree Project in Sustainable Energy Engineering, First Cycle | 15.0 hp | First cycle |
| SA118X | Degree Project in Mechanical Engineering, First Level | 15.0 hp | First cycle |

Supplementary information

Based upon the curriculum for academic year 2021/2022. Changes may occur.

Degree project, bachelor level, 15 credits, is a compulsory course during the spring term.

During the third year 3 conditionally elective courses should be chosen.

Studies on advanced level, year 4 and 5, within the MSc in Engineering programme Design and Product Realization takes place within framework of a Master program.

Available Master programs for Design and Product Realization:

- Integrated Product Design
- Industrial Production

- Industrial Product Development
- Aerospace
- Industrial Management
- Naval Architecture
- Sustainable Energy Engineering
- Technical Mechanics
- Vehicle Engineering

Some Master programs require specific courses during year 3. Under each specialisation, there is information about the courses to be taken to give admission to the various master's programs that are read in the two final years.

Information regarding conditionally elective courses

A degree project for Degree of Bachelor, 15 credits, must be read during study year 3, independently of chosen masters programme.

One of the degree projects below must be read, independently of chosen masters programme:

Year 4

Supplementary information

Information is based upon the curriculum for academic year 2021/2022. Changes may occur.

During the fourth study year of the Degree Programme in Design and Product Realisation, a master's programme must be studied.

Information about which master's programme can be studied, can be found in the programme syllabus. Changes may occur.

For students who chooses to study the following master's programme:

Industrial Economics (TINEM)

it is required that a supplementary technical profil is read in order to obtain a Degree of Master of Science in Engineering.

The following technical profiles can be studied during study year 4-5 (ie during study year 1-2 of the master's programme):

- Engineering Design,
- Energy,
- Production,

- Solid Mechanics

Year 5

Supplementary information

Information is based upon the curriculum for academic year 2021/2022. Changes may occur.

During the fourth study year of the Degree Programme in Design and Product Realisation, a master's programme must be studied.

Information about which master's programme can be studied, can be found in the programme syllabus. Changes may occur.

For students who chooses to study the following master's programme:

Industrial Economics (TINEM)

it is required that a supplementary technical profil is read in order to obtain a Degree of Master of Science in Engineering.

The following technical profiles can be studied during study year 4-5 (ie during study year 1-2 of the master's programme):

- Engineering Design,
- Energy,
- Production,
- Solid Mechanics



Appendix 2: Specialisations

Degree Programme in Design and Product Realisation (CDEPR)

This programme has no specialisations.