



# Programme syllabus

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

## Degree Programme in Mechanical Engineering 180 credits

Högskoleingenjörsutbildning i maskinteknik, Södertälje

*Valid for students admitted to the education from autumn 15 (HT - Autumn term; VT - Spring term).*

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

### Programme objectives

In addition to the aims that are specified in the higher education ordinance, an engineer who has been graduated from Mechanical Engineering, KTH, should

#### Knowledge and understanding

- be able to apply basic technical knowledge in, for example, material technology, solid mechanics, production technology, electrical and control engineering and computer-based engineering tools, such as CAD.

- show basic knowledge in mathematics and natural sciences, and ability to critically and systematically use knowledge to model, simulate and evaluate developments based on relevant information

## Skills and abilities

- show such knowledge and skills necessary for independent work as a Bachelor in in the field of education
- demonstrate the ability to independently and creatively identify, formulate and solve problems in the areas of mechanical engineering with respect to current possibilities and limitations
- demonstrate an ability to manage and shape sustainable products, processes and systems based on technical, ethical, economic and social aspects
- show ability and understanding of the importance of teamwork and collaboration in multidisciplinary and multicultural project teams
- show ability to participate in the use and introduction of new technologies, where it's about designing products, processes and work environment

## Ability to make judgements and adopt a standpoint

- show knowledge about how the design of products and systems is best adapted to human wishes and needs and with regard to environmental aspects
- have awareness of how technology influences society, regarding the conditions and needs of people
- have awareness of the aims of society regarding resource management, economics and environment
- to be able to follow the accelerating technical development and the changes that follow, the student should have acquired the ability to get into new fields of technology and have a good basis for continued personal development and “lifelong learning”, both in the own as well as new subject areas

KTH's local degree ordinance can be found in KTH's regulatory framework, [www.kth.se](http://www.kth.se)

## Extent and content of the programme

Education comprises 180 credits, corresponding to three years of full-time study.

The training is essentially at the first level.

Teaching is done mainly in Swedish. Some courses and course modules are taught in English and some textbooks are in English.

The training is common to all specializations within the first three semesters. Process of selection of specialization is done according to KTH's instructions.

Specializations:

Industrial engineering and production (IEPS)

Innovation and design (IODS)

Robotics and Mechatronics (ROBS) Not currently active

Safety and management of advanced systems(SLAS) Not currently active

## Eligibility and selection

Studying at KTH requires basic eligibility for university studies. In addition, the following specific admission requirements must be met to KTH's Bachelor degree programmes: specific entry requirements A8 (Physics, chemistry, Mathematics 3 c). Other studies or work experience is assessed on the real skills that are invoked.

In other respects, reference is made to the KTH admission routines in regulations, [www.kth.se](http://www.kth.se)

## Implementation of the education

### Structure of the education

Academic year, semester and study periods are retrieved from the regulations, [www.kth.se](http://www.kth.se)

Referring to the academic subdivision regulations, [www.kth.se](http://www.kth.se)

#### **Structure of education**

The academic year is divided into 4 study periods and normally several courses are read in parallel. Teaching and examination forms vary from course to course. Normally a part of the course consists of lectures that provides an initial contact with the concepts and theories. Exercises and laboratory work reinforces the understanding of the theoretical relationships. Project works according to the model from the business community has a vital role in education. It provides training to the group and address reality based tasks in an engineering way.

The training consists of compulsory courses for the first two years. To create a module in the training, interaction between the courses both within each grade as between grades is emphasized. Under the programme two specializations are given, industrial engineering and production as well as Innovation and design.

The training is completed during the last semester with a thesis which is usually implemented with clients outside the school.

#### ***Year 1***

An introductory course provides student perspectives on technology and engineering role as well as the basics of the project methodology, group dynamics and presentation techniques. Basic courses in mathematics, materials science, industrial engineering, programming, mechanics, and CAD is the core of basic courses pertaining to the first year.

### ***Year 2***

During the second year all specializations read courses in scientific and technical implementing subjects. During the year specialization starts. Guidelines are described in more detail in annex 2.

### ***Year 3***

During the third year specialization specific courses are given, some of those are conditionally optional courses. It is possible to choose different courses, provided these are relevant to the programme's objectives and must be approved by the program director.

The training ends with a thesis.

## **Courses**

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

## **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**

### **Courses and registration**

In the fall semester registration occurs during enrollment. Course registration is made through the "personal menu" at [www.kth.se](http://www.kth.se)

A prerequisite for participation in the study is that the students each fall and spring make a registration for courses for the upcoming semester. Course registration is done via [www.antagning.se](http://www.antagning.se) between the 1 and 15 November and 1 and 15 May.

In addition, the students do a semester and course registration in connection with each semester through the "personal menu" at [www.kth.se](http://www.kth.se)

Process of selection of specialization is done prior to semester 4, according to KTH's instructions.

### ***For year 2:***

At least 45 credits from year 1 must be completed through exam period in August. Students who do not meet this requirement shall, in consultation with the study counsellor set up an individual study plan.

***For studies in year 3:***

At least 90 credits from year 1 and 2 must be completed through the exam period in August. Students who do not meet this requirement shall, in consultation with the study counsellor set up an individual study plan.

For thesis, see separate title.

## Recognition of previous academic studies

A Student of mechanical engineering program have the opportunity to apply for credit results from the course/courses at another College/University within or outside the country.

KTH's policy for recognition is available in its entirety in regulations, [www.kth.se](http://www.kth.se)

## Studies abroad

Students at the Mechanical Engineering Programme have the opportunity to study abroad through the agreements KTH has with universities within and outside of the EU. Exchange studies may normally not be done during the first or second year. It is also possible to carry out the degree project abroad.

Application deadline for studying abroad, se [www.kth.se](http://www.kth.se)

## Degree project

The degree project comprises 15 HE credits.

***The following applies for the degree project:***

- It may be started, at the earliest, after having achieved 120 HE credits and when final grades exist in relevant courses that concern the contents of the degree project
- It may be started after that the assignment has been approved by the examiner
- It is based on the knowledge that has been acquired during the education and should normally be carried out during semester 6
- It should constitute proof of an independent work comprising theoretical and/or experimental work with accompanying report writing and oral presentation
- The supervisor is appointed by the examiner

KTH's rules for degree projects can be found in KTH's regulatory framework, [www.kth.se](http://www.kth.se)

# Degree

To complete a Bachelor of Science in Engineering, Degree Programme in Mechanical Engineering, passing grades in all courses that are included in the student's study plan are required. The study plan consists of the compulsory courses, the elective courses that the student has opted for and the degree project. The study plan should comprise at least 180 HE credits.

KTH's local degree ordinance can be found in KTH's regulatory framework, [www.kth.se](http://www.kth.se)

Appendix 1 - Course list

Appendix 2 - Programme syllabus descriptions



# Appendix 1: Course list

## Degree Programme in Mechanical Engineering (TIMAS)

### General courses

Year 1

#### Mandatory courses (63.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">ML1000</a>	Engineering Mathematics	11.0 hp	First cycle
<a href="#">ML1040</a>	Programme Integrating Course in Mechanical Engineering	6.0 hp	First cycle
<a href="#">ML1101</a>	Mechanics, General Course	7.5 hp	First cycle
<a href="#">ML1112</a>	Mechanical Engineering, Introductory Course	7.5 hp	First cycle
<a href="#">ML1113</a>	Business Control with Applied Statistics	10.0 hp	First cycle
<a href="#">ML1200</a>	Engineering Materials and Production, General Course	10.0 hp	First cycle
<a href="#">ML1302</a>	Computerized Engineering Tools	11.0 hp	First cycle

#### Optional courses

Code	Name	Credits	Edu. level
<a href="#">ML0001</a>	Introduction to Mathematics	1.5 fup	Pre-university level
<a href="#">ML0002</a>	Introduction to Computer Studies	1.5 fup	Pre-university level

## Supplementary information

Course list: Information is based upon the curriculum for academic year 2015/2016. Changes may occur.

### Year 2

#### Mandatory courses (34.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">ML1040</a>	Programme Integrating Course in Mechanical Engineering	6.0 hp	First cycle
<a href="#">ML1201</a>	Strength of Materials, General Course	6.0 hp	First cycle
<a href="#">ML1203</a>	Energy Technology	6.0 hp	First cycle
<a href="#">ML1204</a>	Machine Components	6.0 hp	First cycle
<a href="#">ML1306</a>	Electrical and Control Engineering	10.5 hp	First cycle

## Supplementary information

Course list: Information is based upon the curriculum for academic year 2016/2017. Changes may occur.

## Industrial Business Administration and Manufacturing (IEPS)

### Year 2

#### Mandatory courses (28.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">HM1016</a>	Manufacturing Process, Intermediate Course 1	7.5 hp	First cycle
<a href="#">HU1000</a>	Industrial Marketing	7.5 hp	First cycle
<a href="#">ML1030</a>	Industrial Economics and Organisation	7.5 hp	First cycle
<a href="#">ML1106</a>	Factory Design	6.0 hp	First cycle



## Supplementary information

Course list: Information is based upon the curriculum for academic year 2016/2017. Changes may occur.

### Year 3

#### Mandatory courses (9.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">HU1001</a>	Business Calculation and Decision Models	7.5 hp	First cycle
<a href="#">ML1042</a>	Programme Integrating Course in Mechanical Engineering, Intermediate Course	2.0 hp	First cycle

#### Conditionally elective courses

Code	Name	Credits	Edu. level
<a href="#">HM1021</a>	Quality Tools for Continual Improvement	7.5 hp	First cycle
<a href="#">HU1903</a>	Management	7.5 hp	First cycle
<a href="#">ML100X</a>	Degree Project in Mechanical Engineering, First Cycle	15.0 hp	First cycle
<a href="#">ML101X</a>	Degree Project in Industrial Business Administration and Manufacturing, First Cycle	15.0 hp	First cycle
<a href="#">ML1114</a>	Accounting	6.5 hp	First cycle
<a href="#">ML1115</a>	Civil and Commercial Law for Engineers, Minor Course	6.5 hp	First cycle
<a href="#">ML1136</a>	Logistics, Minor Course	6.5 hp	First cycle
<a href="#">ML2200</a>	Manufacturing Process, Intermediate Course 2	7.5 hp	Second cycle

## Supplementary information

Course list: Information is based upon the curriculum for academic year 2016/2017. Changes may occur.

# Innovation and Industrial Design (IODS)

## Year 2

### Mandatory courses (28.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">ML1030</a>	Industrial Economics and Organisation	7.5 hp	First cycle
<a href="#">ML1210</a>	Design and Product Development 1	7.5 hp	First cycle
<a href="#">ML1211</a>	Design and Product Development 2	6.0 hp	First cycle
<a href="#">ML1212</a>	Computer Support for Design Engineering 2	7.5 hp	First cycle

## Supplementary information

Course list: Information is based upon the curriculum for academic year 2016/2017. Changes may occur.

## Year 3

### Mandatory courses (22.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">ML1042</a>	Programme Integrating Course in Mechanical Engineering, Intermediate Course	2.0 hp	First cycle
<a href="#">ML1125</a>	Integrated Product Development, Project Course	13.0 hp	First cycle
<a href="#">ML2202</a>	Computerized Tools in Design Process, Intermediate Course	7.5 hp	Second cycle

## Conditionally elective courses

Code	Name	Credits	Edu. level
<a href="#">HM1012</a>	Industrial Design with Colour and Form, Intermediate Course	7.5 hp	First cycle
<a href="#">ML100X</a>	Degree Project in Mechanical Engineering, First Cycle	15.0 hp	First cycle
<a href="#">ML102X</a>	Degree Project in Innovation and Design, First Cycle	15.0 hp	First cycle
<a href="#">ML1205</a>	Production Driven Product Design	7.5 hp	First cycle
<a href="#">ML1214</a>	Solid Mechanics, Advanced Course	7.5 hp	First cycle
<a href="#">ML2201</a>	Computerized Tools in Mechanical Design, Intermediate Course	7.5 hp	Second cycle

## Supplementary information

Course list: Information is based upon the curriculum for academic year 2016/2017. Changes may occur.



# Appendix 2: Specialisations

## Degree Programme in Mechanical Engineering (TIMAS)

### Industrial Business Administration and Manufacturing (IEPS)

Typical courses of specialisation starts in grade two with industrial marketing, Engineering Design, and an advanced course in production engineering. Focus builds on, among other grounds from the machine scheme common course for business management with applied statistics where lean philosophy is a central perspective. During the third year the student is given the opportunity to add their own profile on the training programme by either immerse themselves or broaden itself. As an example of what this means at course level specialization includes courses in calculations and decision models, production technology, quality and service improvement tools, management, accounting, and entrepreneurship, logistics and law for engineers. The third year ends with a thesis of 15 credits.

### Innovation and Industrial Design (IODS)

The focus builds on the bases of the machine joint courses in eg. mechanics, solid mechanics, CAD and machine components. Centrally topics are the use of computer-based product development tools, as well as work in project form. Some of these are carried out in cooperation with industry. During the second year there are given courses in industrial design, engineering, CAD and product development methodology. During the third year some opportunity to own profile is given. Students can immerse themselves in the design, and industrial design or construction and calculations. A key issue is integrated product development. Also widening with courses in eg. industrial engineering and logistics management is possible. The third year ends with a thesis of 15 credits.