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 12 (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 the knowledge and ability required to work independently as an engineer in the disciplinary domain
- show ability to independently and creatively identify, formulate and solve problems in mechanical engineering fields, considering prevailing possibilities and limitations
- show ability to handle and shape products, processes and systems from technical, ethical and economic aspects
- show ability for, and an understanding of, the importance of teamwork and cooperation in multicultural and multi-disciplinary project groups
- be able to participate in the use and introduction of new technology, related to designing of products, processes and working 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, other and new subject areas

KTH's local degree ordinance can be found in KTH's regulatory framework,***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 undergraduate 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. Elections to the focus takes place according to KTH's instructions.

Specializations:

Industrial engineering and production (IEPS)
Innovation and design (IODS)
Robotics and Mechatronics (ROBS)
Security and management of advanced systems (SLAS)

Eligibility and selection

To study at KTH, the general entry requirements for higher education apply. Furthermore, the following specific entry requirements must be fulfilled for admission to KTH's engineering programmes: Mathematics D, Physics B and Chemistry A, or equivalent. For each of the subjects, a grade of at least Pass or 3 is required. Other studies or professional experience is assessed based on the prior knowledge required.

For more information, refer to KTH's admission regulations found in KTH's regulatory framework, ***www.kth.se***

Implementation of the education

Structure of the education

Educational approach

Academic year, semester and study periods are retrieved from the regulations, www.kth.se
Referring to the academic subdivision regulations, www.kth.se

Structure of education

The academic year is divided into 4 study periods and normally read several courses 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 for the group to 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, the interaction between the courses both within each grade as between grades, is emphasized. Under the programme there are four specializations given, Industrial engineering and production, Innovation and design, Robotics and Mechatronics, safety and management of complex systems.

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 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. In two of the first-year courses are project a great deal which can be tilted against each thrust.

Year 2

During the second year all specializations read courses in the scientific and technical implementing subjects. Specializations begins during year 2. Specialization guidelines are described in more detail in annex 2.

Year 3

The third year is targeting specific courses, some of which are conditionally optional courses (selectable within the specialization). It is possible to choose other courses, provided these are relevant to the programme's objectives. These elections will give the possibility to create an education with individual profile.

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

Enrolment

A prerequisite to be allowed to participate in the studies is that the student verfies enrollment for courses the coming term every spring and fall. This is done via www.antagning.se between the 1st and 15th of November and the 1st and 15th of May. In addition, the students do a semester and course registration in connection with each semester through the "personal menu" at www.kth.se

For studies in year 2:

At least 45 HE credits from year 1 should be completed by the examination period in August. Students who do not fulfil this requirement should establish an individual study plan in consultation with a study adviser.

For studies in year 3:

At least 90 HE credits from year 1 and 2 completed by the examination period in August. Students who do not fulfil this requirement should establish an individual study plan in consultation with a study adviser.

Recognition of previous academic studies

Students may apply to include credit results from course/courses at other higher education institution /university within or outside of the country.

KTH's policy for inclusion can be found in full in KTH's regulatory framework, ***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, see ***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***

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***

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 (60.0 Credits)

Code	Name	Credits	Edu. level
ML1000	Engineering Mathematics	11.0 hp	First cycle
ML1101	Mechanics, General Course	7.5 hp	First cycle
ML1102	Perspective on Mechanical Engineering	9.0 hp	First cycle
ML1103	Business Control with Applied Statistics	11.5 hp	First cycle
ML1200	Engineering Materials and Production, General Course	10.0 hp	First cycle
ML1302	Computerized Engineering Tools	11.0 hp	First cycle

Optional courses

Code	Name	Credits	Edu. level
HN1009	Introduction to Mathematics	1.5 hp	First cycle
HN1010	Introduction to Computer Studies	1.5 hp	First cycle

Year 2

Mandatory courses (31.5 Credits)

Code	Name	Credits	Edu. level
ML1041	Programme Integrating Course in Mechanical Engineering, Minor Course	3.0 hp	First cycle
ML1201	Strength of Materials, General Course	6.0 hp	First cycle
ML1203	Energy Technology	6.0 hp	First cycle
ML1204	Machine Components	6.0 hp	First cycle
ML1306	Electrical and Control Engineering	10.5 hp	First cycle

Industrial Business Administration and Manufacturing (IEPS)

Year 2

Mandatory courses (31.5 Credits)

Code	Name	Credits	Edu. level
HM1016	Manufacturing Process, Intermediate Course 1	7.5 hp	First cycle
HU1000	Industrial Marketing	7.5 hp	First cycle
ML1020	Industrial Economics and Organisation	7.5 hp	First cycle
ML1041	Programme Integrating Course in Mechanical Engineering, Minor Course	3.0 hp	First cycle
ML1106	Factory Design	6.0 hp	First cycle

Year 3

Mandatory courses (9.5 Credits)

Code	Name	Credits	Edu. level
HU1001	Business Calculation and Decision Models	7.5 hp	First cycle
ML1042	Programme Integrating Course in Mechanical Engineering, Intermediate Course	2.0 hp	First cycle

Conditionally elective courses

Code	Name	Credits	Edu. level
HM101X	Degree Project in Industrial Business Administration and Manufacturing, First Cycle	15.0 hp	First cycle
HM1021	Quality Tools for Continual Improvement	7.5 hp	First cycle
HM102X	Degree Project in Mechanical Engineering, First Cycle	15.0 hp	First cycle
HU1903	Management	7.5 hp	First cycle
ML1114	Accounting	6.5 hp	First cycle
ML1115	Civil and Commercial Law for Engineers, Minor Course	6.5 hp	First cycle
ML1136	Logistics, Minor Course	6.5 hp	First cycle
ML2200	Manufacturing Process, Intermediate Course 2	7.5 hp	Second cycle

Supplementary information

Course list: Information is based upon the curriculum for academic year 2014/2015 Changes may occur.

Innovation and Industrial Design (IODS)

Year 2

Mandatory courses (31.5 Credits)

Code	Name	Credits	Edu. level
ML1020	Industrial Economics and Organisation	7.5 hp	First cycle
ML1041	Programme Integrating Course in Mechanical Engineering, Minor Course	3.0 hp	First cycle
ML1210	Design and Product Development 1	7.5 hp	First cycle
ML1211	Design and Product Development 2	6.0 hp	First cycle
ML1212	Computer Support for Design Engineering 2	7.5 hp	First cycle

Year 3

Mandatory courses (22.5 Credits)

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

Conditionally elective courses

Code	Name	Credits	Edu. level
HM100X	Degree Project in Innovation and Design, First Cycle	15.0 hp	First cycle
HM1012	Industrial Design with Colour and Form, Intermediate Course	7.5 hp	First cycle
HM102X	Degree Project in Mechanical Engineering, First Cycle	15.0 hp	First cycle
HM103X	Degree Project in Mechanical Design, First Cycle	15.0 hp	First cycle
ML1205	Production Driven Product Design	7.5 hp	First cycle
ML1214	Solid Mechanics, Advanced Course	7.5 hp	First cycle
ML2201	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 2014/2015 Changes may occur.

Robotics and Mechatronics (ROBS)

Year 2

Mandatory courses (31.5 Credits)

Code	Name	Credits	Edu. level
HE1004	Digital Electronics	7.5 hp	First cycle
ML1020	Industrial Economics and Organisation	7.5 hp	First cycle
ML1041	Programme Integrating Course in Mechanical Engineering, Minor Course	3.0 hp	First cycle
ML1300	Computer Programming Basic Course	7.5 hp	First cycle
ML1315	Micro Computers	6.0 hp	First cycle

Year 3

Mandatory courses (9.5 Credits)

Code	Name	Credits	Edu. level
HE1024	Real Time Systems	7.5 hp	First cycle
ML1042	Programme Integrating Course in Mechanical Engineering, Intermediate Course	2.0 hp	First cycle

Conditionally elective courses

Code	Name	Credits	Edu. level
HE1009	Applied Electronics	7.5 hp	First cycle
HE1011	Control Systems	7.5 hp	First cycle
HE102X	Degree Project in Mechatronics and Robotics, First Cycle	15.0 hp	First cycle
HM102X	Degree Project in Mechanical Engineering, First Cycle	15.0 hp	First cycle
ML1318	Analogue Technology	7.5 hp	First cycle
ML1324	PLC- Programming, Minor Course	6.5 hp	First cycle
ML1325	Robotics, Minor Course	6.5 hp	First cycle

Supplementary information

Course list: Information is based upon the curriculum for academic year 2014/2015 Changes may occur.

Safety and management of advanced systems (SLAS)

Year 2

Mandatory courses (31.5 Credits)

Code	Name	Credits	Edu. level
HM1016	Manufacturing Process, Intermediate Course 1	7.5 hp	First cycle
HN2008	Strategies for Safety	7.5 hp	Second cycle
ML1020	Industrial Economics and Organisation	7.5 hp	First cycle
ML1041	Programme Integrating Course in Mechanical Engineering, Minor Course	3.0 hp	First cycle
ML1106	Factory Design	6.0 hp	First cycle

Year 3

Mandatory courses (2.0 Credits)

Code	Name	Credits	Edu. level
ML1042	Programme Integrating Course in Mechanical Engineering, Intermediate Course	2.0 hp	First cycle

Conditionally elective courses

Code	Name	Credits	Edu. level
HM1021	Quality Tools for Continual Improvement	7.5 hp	First cycle
HM102X	Degree Project in Mechanical Engineering, First Cycle	15.0 hp	First cycle
KH1341	Environmental Technology	7.5 hp	First cycle
ML1107	Leadership and Organisation, Basic Course	6.5 hp	First cycle
ML1197	Safety and Management of Advanced Systems, Project Course	14.0 hp	First cycle
ML198X	Degree Project in Safety and Management of Advanced Systems, First Cycle	15.0 hp	First cycle
ML2200	Manufacturing Process, Intermediate Course 2	7.5 hp	Second cycle

Supplementary information

Course list: Information is based upon the curriculum for academic year 2014/2015 Changes may occur.

Appendix 2: Specialisations

Degree Programme in Mechanical Engineering (TIMAS)

Industrial Business Administration and Manufacturing (IEPS)

No information entered.

Innovation and Industrial Design (IODS)

No information entered.

Robotics and Mechatronics (ROBS)

No information entered.

Safety and management of advanced systems (SLAS)

No information entered.