



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 09 (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 method 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 mechanical engineering
- 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 and 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 technology 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 within the own 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

The education comprises 180 HE credits, which corresponds to 3 years of full-time studies.

The level of the education is mainly for first-cycle studies.

The teaching is mainly in Swedish. Certain courses and parts of courses are taught in English.

Eligibility and selection

To study at KTH, 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

Academic year, semesters and study periods are described in KTH's regulatory framework, www.kth.se

Structure of the education

The academic year is normally divided into 4 study periods, and normally two courses are read in parallel during each study period. The teaching and examination forms vary from course to course. Normally, a part of the course consists of lectures that provide an introduction to concepts and theories. Practical assignments and laboratory sessions reinforce the understanding of the theoretical relationships. Project work according to models from the industry has an essential role in the education. Here, training is given to work in groups with reality-based assignments with an engineering approach.

The education consists of compulsory courses during the first two years. In order to create wholeness in the education, cooperation between the courses is emphasised, both within each year and between the years. Two specialisations are offered in the programme, Industrial Economics and Production and Innovation and Design.

The education is completed during the final semester with a degree project that is usually carried out with employers outside of school.

Year 1

The first year is common to the specialisations of the programme, apart from one course.

An introductory course in project methodology provides the basis for project work, which is an essential part of all education. Mathematics, Programming, Computer-based Design Tools, Materials and Production and Solid Mechanics with Statics constitute the core of basic courses belonging to the first year. Two of the first year courses are carried out for the most part as project courses. The

courses that separate the specialisations in year 1 are Industrial Design with Colour and Craft, which is given for Innovation and Design, and Economics and Management, which is given for Industrial Economics and Production. The economics course is given in year 2 for Innovation and Design.

Year 2

In the second year, the specialisations in the study fields begin. These are described more comprehensively in appendix 2. Four courses are common to both specialisations. They are Applied Mathematics, Sustainable Development with Working Environment, Electrical and Control Engineering and Competence and Development. The latter intends, in a general sense, to prepare for the future professional role. The course focuses on non-subject-specific fields, such as personal and professional development and reflection on the future professional role.

Year 3

In addition, alternative courses are given (elective within the specialisation) and opportunity exists to freely choose other courses comprising 15 HE credits, provided that these have relevance for the educational objectives of the programme. These choices give the opportunity to create an education with an individual profile.

The education is completed with a degree project.

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

A precondition for participating in the studies is that the student must enrol for the each semester. This is done according to KTH's instructions.

With the enrolment, the student has reported the intention to study and participate in the education. After that, it is possible for the student to:

- register for the semester
- register for courses
- get results reported
- have the possibility to receive student aid from CSN

Course application

Course applications within the programme are made by the student before each semester according to KTH's instructions.

Conditions for promotion

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. Application can be found on KTH's website, www.kth.se

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 is around the 15th of January.

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

Industrial Business Administration and Manufacturing (IEPS)

Year 1

Mandatory courses (60.0 Credits)

Code	Name	Credits	Edu. level
HM1000	Engineering Materials and Production 1	7.5 hp	First cycle
HM1001	Strength of Materials with Statics	7.5 hp	First cycle
HM1002	Computerized Tools in Design Process	7.5 hp	First cycle
HM1003	Engineering Materials and Production 2	7.5 hp	First cycle
HM1007	Computer Programming	7.5 hp	First cycle
HN1900	Engineering and Information Skills	7.5 hp	First cycle
HN1901	Mathematics I	7.5 hp	First cycle
HU1900	Business Economics and Organizational Behaviour	7.5 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 (60.5 Credits)

Code	Name	Credits	Edu. level
HM1005	Quality Assurance	7.5 hp	First cycle
HM1006	Electrical and Control Engineering	7.5 hp	First cycle
HM1013	Mechanical Design and Energy Technology	7.5 hp	First cycle
HM1016	Manufacturing Process, Intermediate Course 1	7.5 hp	First cycle
HN1002	Applied Mathematics	7.5 hp	First cycle
HU1000	Industrial Marketing	7.5 hp	First cycle
HU1901	Engineering Practice and Development	7.5 hp	First cycle
MJ1506	Sustainable Development and Working Environment	8.0 hp	First cycle

Year 3

Mandatory courses (7.5 Credits)

Code	Name	Credits	Edu. level
HU1001	Business Calculation and Decision Models	7.5 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
HM1026	Logistics	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
HU1904	Account and Entrepreneurship	7.5 hp	First cycle
HU1905	Civil and Commercial Law for Engineers	7.5 hp	First cycle
ML2200	Manufacturing Process, Intermediate Course 2	7.5 hp	Second cycle

Innovation and Industrial Design (IODS)

Year 1

Mandatory courses (60.0 Credits)

Code	Name	Credits	Edu. level
HM1000	Engineering Materials and Production 1	7.5 hp	First cycle
HM1001	Strength of Materials with Statics	7.5 hp	First cycle
HM1002	Computerized Tools in Design Process	7.5 hp	First cycle
HM1003	Engineering Materials and Production 2	7.5 hp	First cycle
HM1007	Computer Programming	7.5 hp	First cycle
HM1009	Industrial Design with Colour and Craft	7.5 hp	First cycle
HN1900	Engineering and Information Skills	7.5 hp	First cycle
HN1901	Mathematics I	7.5 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 (60.5 Credits)

Code	Name	Credits	Edu. level
HM1006	Electrical and Control Engineering	7.5 hp	First cycle
HM1008	Mechanics II	7.5 hp	First cycle
HM1010	Functional Elements	7.5 hp	First cycle
HM1018	Innovation and Design Process	7.5 hp	First cycle
HN1002	Applied Mathematics	7.5 hp	First cycle
HU1900	Business Economics and Organizational Behaviour	7.5 hp	First cycle
HU1901	Engineering Practice and Development	7.5 hp	First cycle
MJ1506	Sustainable Development and Working Environment	8.0 hp	First cycle

Year 3

Conditionally elective courses

Code	Name	Credits	Edu. level
HM1004	Solid Mechanics, Intermediate Course	7.5 hp	First cycle
HM100X	Degree Project in Innovation and Design, First Cycle	15.0 hp	First cycle
HM1011	Ergonomics in Product Development	7.5 hp	First cycle
HM1012	Industrial Design with Colour and Form, Intermediate Course	7.5 hp	First cycle
HM1015	Integrated Product Development, Project Course	15.0 hp	First cycle
HM1016	Manufacturing Process, Intermediate Course 1	7.5 hp	First cycle
HM1023	Applied Mechanics	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
HS1027	Light, Acoustics and Design	7.5 hp	First cycle
ML2201	Computerized Tools in Mechanical Design, Intermediate Course	7.5 hp	Second cycle
ML2202	Computerized Tools in Design Process, Intermediate Course	7.5 hp	Second cycle

Nuclear Engineering (NUKS)

Year 3

Mandatory courses (60.0 Credits)

Code	Name	Credits	Edu. level
AK1001	Risk and Safety in the Nuclear Industry	7.5 hp	First cycle
AK1002	Safety in Complex Systems	7.5 hp	First cycle
HE1011	Control Systems	7.5 hp	First cycle
ML1104	Operation and Maintenance of Nuclear Power Plants	7.5 hp	First cycle
ML110X	Degree Project in Nuclear Engineering, First Cycle	15.0 hp	First cycle
SH1600	Physics of Nuclear Engineering	7.5 hp	First cycle
SH1700	Nuclear Engineering	7.5 hp	First cycle



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.

Nuclear Engineering (NUKS)

No information entered.