



Programme syllabus

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

Degree Programme in Electronics and Computer Engineering 180 credits

Högskoleingenjörsutbildning i elektronik och datorteknik

Valid for students admitted to the education from autumn 18 (HT - Autumn term; VT - Spring term).

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

Programme objectives

The purpose of the Degree program in engineering at KTH is to train students for electronic and computer engineering of high international standard to meet society's need for competence for the use and development of technology. Training must be balanced so that the engineer students are well prepared to begin practice in their profession, but also have a good basis for continuing self-development and learning.

For engineering programs in particular, it is necessary to provide knowledge and skills in applied mathematics, basic and applied technical subjects, computer systems and its use and the knowledge and understanding of technology and the general conditions for engineering work.

Knowledge and understanding

For Bachelor of Science in Engineering, the student shall

- demonstrate knowledge of the scientific basis for computer technology and its proven experience and knowledge of current research and development work and
- demonstrate broad knowledge in the chosen technology and relevant skills in mathematics and science

Skills and abilities

For Bachelor of Science in engineering, the student shall

- demonstrate the ability to in a holistic way independently and creatively identify, formulate and manage issues and analyze and evaluate various technologies related to information technology,
- demonstrate an ability to plan and use appropriate methods to carry out tasks within a given framework,
- demonstrate an ability to critically and systematically use knowledge and to model, simulate, predict and evaluate events based on relevant information,
- demonstrate an ability to design and manage products, processes and systems with regard to human conditions and needs and society's objectives for economically, socially and ecologically sustainable development,
- demonstrate ability for teamwork and collaboration in groups with different composition and
- demonstrate ability to verbally and in writing, explain and discuss information, problems and solutions in dialogue with different groups.

For a degree from the study programme Electronics and Computer Engineering the student shall

- be able to use methods to design, implement, document and maintain systems integrating both hard- and software and
- have knowledge in adjacent subject fields, like communication and control theory to be able to design embedded systems in this field of application.

Ability to make judgements and adopt a standpoint

For Bachelor of Science in Engineering, the student shall

- demonstrate an ability to make judgments in the light of relevant scientific, social and ethical aspects,
- demonstrate an understanding of technology capabilities and limitations, its role in society and people's responsibility for its use, including social and economic aspects, environmental and safety aspects, and

- demonstrate an ability to identify their needs for additional knowledge and to continuously develop their skills.

Extent and content of the programme

The training comprises 3 consecutive academic years and comprises 180 credits.

Education level is first level. The programme is not divided into several exits but there are some elective courses.

The policy at KTH is that the language of education is Swedish at first level and English at second level. Some of the courses at first level can be taught in English depending on the teacher. Literature is often in English, but this varies from year to year. Course materials are mostly in Swedish, but English occurs.

The programme is goal-oriented and there is a clear progress to deeper knowledge into electronics and computer engineering. The students are introduced into project skills early in the programme and this knowledge is strengthened later in the program to finally running a project with external customers in the last year.

Eligibility and selection

See eligibility for KTH's programmes:

<https://www.kth.se/utbildning/anmalan-antagning-behorighet/behoriget>.

Implementation of the education

Structure of the education

Academic year, semesters and other study periods are described at KTH student web site <http://www.kth.se/student/schema/1.1007>.

Common basic courses. The basic courses common for all engineering programmes at ICT School consists of courses in mathematics, computer programming, computer networks, digital design and computer hardware engineering. These courses will give the students basic knowledge in mathematics and information technology. This basic unit of courses is 75 credit units.

Programme specific courses. The courses specific for this programme starts at the end of the first year with electrical circuits and continues the second and third year with analog electronics, embedded systems, control engineering, signal processing and electronic product development. Programme specific courses is 45 credit units. In the third year there is a thesis work of 15 credit units, 15 units elective course and 30 credit units mandatory courses.

Elective courses can be KTH-courses or courses from other universities. Such courses could after request from program responsible teacher be counted in as elective course. The elective courses shall be taken after the student has been adopted to the study programme.

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

Participation requires admission to courses within the programme and course registration. Course registration is done via the personal menu at www.kth.se

For students starting their education from the autumn semester 2018, previous promotion requirements have been replaced with special admission requirements to each course. Admission requirements are specified in the course syllabus.

Recognition of previous academic studies

A Student who has taken courses at another University can receive credit for the courses in the degree. The courses that shall be accepted cannot overlap a course already studied at KTH. To replace any compulsory course, documented knowledge to the same extent as for the compulsory course must be presented.

KTH policy for recognition of previous academic studies is available at KTH student web.

<https://intra.kth.se/styrning/regelverk/utbildning-pa-grund-och-avancerad-niva-1.660818>.

Studies abroad

To be qualified as a student for exchange studies within an exchange agreement with foreign universities the student have to

- have maximally two unfinished courses as a second year student
- have maximally three unfinished courses as a third year student.

For the selection of programme specific exchange positions the KTH selection rules is valid.

Degree project

The study programme ends with a 15 credit units degree project. The project can be carried out at a department within KTH, in industry or at another university in Sweden or abroad. In all cases there shall be an examiner at KTH. The degree project has to be accepted and registered at the school before the student starts the project and the special admission requirements must be fulfilled. The degree project shall be done within the main topic of the programme and be an extension and/or a deepening regarding academic preference or engineering wise preferences.

The degree project is graded P/F (Pass/Fail). In order to pass, the degree project must show high quality as tested against the relevant examination objectives, often all national examination objectives.

Directives and criteria for passing and grading are available at:

<https://intra.kth.se/styrning/regelverk/utbildning-pa-grund-och-avancerad-niva-1.660818>

Specific directives and criteria for grading is available in the official course syllabus.

Degree

Requirements for exam is fulfilled when the student have passed all required courses in the programme. The degree is “Bachelor of Science in Engineering”. It is written in the text part of the degree diploma that the study programme is Electronics and Computer Engineering. The application to receive the degree diploma is sent to the student administration office at the School of Information and Communication Technology.

Reference to KTH regulations

<https://intra.kth.se/styrning/regelverk/utbildning-pa-grund-och-avancerad-niva-1.660818>.

Appendix 1 - Course list

Appendix 2 - Programme syllabus descriptions



Appendix 1: Course list

Degree Programme in Electronics and Computer Engineering (TIEDB)

General courses

Year 1

Mandatory courses (60.0 Credits)

Code	Name	Credits	Edu. level
ID1018	Programming I	7.5 hp	First cycle
IE1204	Digital Design	7.5 hp	First cycle
IF1330	Electrical Principles	7.5 hp	First cycle
II1300	Engineering Skills	7.5 hp	First cycle
IS1200	Computer Hardware Engineering	7.5 hp	First cycle
IX1303	Algebra and Geometry	7.5 hp	First cycle
IX1304	Calculus	7.5 hp	First cycle
IX1307	Problem-Solving in Mathematics	7.5 hp	First cycle

Year 2

Mandatory courses (60.0 Credits)

Code	Name	Credits	Edu. level
ID1020	Algorithms and Data Structures	7.5 hp	First cycle
IE1202	Analog Electronics	7.5 hp	First cycle
IE1332	Electronic Product Development	7.5 hp	First cycle
II1302	Projects and Project Methods	7.5 hp	First cycle
II1303	Signal Processing	7.5 hp	First cycle
IK1203	Networks and Communication	7.5 hp	First cycle
IS1300	Embedded Systems	7.5 hp	First cycle
IX1500	Discrete Mathematics	7.5 hp	First cycle

Year 3

Mandatory courses (45.0 Credits)

Code	Name	Credits	Edu. level
HE1038	Control Engineering	7.5 hp	First cycle
IK1330	Wireless Systems	7.5 hp	First cycle
IL1331	VHDL Design	7.5 hp	First cycle
IL142X	Degree Project in Electronics and Computer Engineering, First Cycle	15.0 hp	First cycle
IX1501	Mathematical Statistics	7.5 hp	First cycle

Optional courses

Code	Name	Credits	Edu. level
AG1815	Sustainable Development, ICT and Innovation	7.5 hp	First cycle
DH2642	Interaction Programming and the Dynamic Web	7.5 hp	Second cycle
ID1019	Programming II	7.5 hp	First cycle
ID1213	Logic Programming, Basic Course	7.5 hp	First cycle
II2302	Sensor Based Systems	7.5 hp	Second cycle
IL1333	Hardware Security	7.5 hp	First cycle
IL2212	Embedded Software	7.5 hp	Second cycle
ME1003	Industrial Management, Basic Course	6.0 hp	First cycle
SF1626	Calculus in Several Variables	7.5 hp	First cycle
SK1118	Electromagnetism and Waves	7.5 hp	First cycle

Conditionally elective courses

Code	Name	Credits	Edu. level
IV1351	Data Storage Paradigms	7.5 hp	First cycle

Supplementary information

Elective courses 15 cr belongs to year 3.

The elective courses listed below is strongly recommended to take. Although students can in consultation with the Programme Director choose other suitable courses.



Appendix 2: Specialisations

Degree Programme in Electronics and Computer Engineering (TIEDB)

This programme has no specialisations.