Programme syllabus

Bachelor's Programme in Information and Communication Technology
Kandidatprogram, informations- och kommunikationsteknik
180.0 credits

Valid for students admitted to the education from autumn 19 (HT - Autumn term; VT - Spring term).

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

Programme objectives

The students should during the first three years of the education, obtain basic disciplinary knowledge, skills and competencies during the first three years of the education in the core areas of information and communication technology: mathematics, electronics, computer, communication and software engineering.

In addition to the requirements of the Higher Education Ordinance the following apply:

Knowledge and understanding

To be awarded a degree of Bachelor of Science in technology from the study programme, the student should be able to:

- apply mathematics and basic natural sciences within information and communication technology.
- follow and utilize the knowledge development within the field of technology.

Skills and abilities

To be awarded a degree of Bachelor of Science in technology from the study programme, the student should be able to:

- apply creative and critical working methods to formulate and explore problems within the area of information and communication technology with modern methods and tools.
- analyse technical problems from a systems perspective with an overall view on technical systems and their life cycle from conception, design, implementation, production, operation, maintenance and phasing-out.
- adopt a problem-solving perspective based on the need and functionality of the product and service, considering the individuals using the product as well as the technology interplay within the society.
- discuss technical problems and present work results in oral and written form, in English, to different target groups, as needed for an international career.

Ability to make judgements and adopt a standpoint

To be awarded a degree of Bachelor of Science in technology from the study programme, the student should be able to:

- by exercise and reflection have developed an ability to work efficiently in groups of different compositions.

Extent and content of the programme

The education comprises three years and 180 credits. Education level is first-cycle. The education is given in English.
Eligibility and selection

General admission requirements and the following special admission requirements must be fulfilled in order to be admitted: Documented knowledge in Mathematics and Physics corresponding to Mathematics 4 (advanced level of mathematics) and Physics 2 (advanced level of physics) and documented proficiency in English corresponding to English 6. In each of the subjects, applicants must have at least a passing grade.

The selection process is based on final upper secondary (high school) grades and test results on the Swedish Scholastic Aptitude Test. Two-thirds of the seats in the programme are offered based on grade selection and one-third on the Swedish Scholastic Aptitude Test.

For the first (international) application round, fee-paying and non-fee paying applicants are placed in separate selection groups.

Implementation of the education

Structure of the education

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

The courses in school years 1-3 should help the student to acquire a solid foundation of mathematics/natural sciences, basic technological sciences and professional skills.

Courses

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

Courses are either compulsory or elective. These are scheduled so that primarily two courses are read and completed in the same period.

In school year three a number of elective courses can be chosen. The space for elective courses within the programme can be used to study pre-requisite courses for different master’s programmes in case there are such requirements.

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.

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.

Degree project

The degree project is the final part of the education. The project work may begin when special admission requirements for the course are fulfilled.

Degree

Degree is entitled “Teknologie kandidatexamen” - Bachelor of Science. The main field of study, Technology, is stated in the text on the degree certificate. The text on the degree certificate states the educational programme, Information and Communication Technology, completed by the student.
Appendix 1 - Course list
Appendix 2 - Programme syllabus descriptions
# Appendix 1: Course list

Bachelor's Programme in Information and Communication Technology (TCOMK), Programme syllabus for studies starting in autumn 2019

## General courses

### Year 1

**Mandatory courses (60.0 credits)**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
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</thead>
<tbody>
<tr>
<td>ID1018</td>
<td>Programming I</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>IE1204</td>
<td>Digital Design</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>IE1206</td>
<td>Embedded Electronics</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>II1306</td>
<td>Introduction to IT</td>
<td>1.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>IS1200</td>
<td>Computer Hardware Engineering</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1610</td>
<td>Discrete Mathematics</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1684</td>
<td>Algebra and Geometry</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1685</td>
<td>Calculus in One Variable</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1690</td>
<td>Basic Course in Mathematics</td>
<td>6.0</td>
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### Year 2

**Mandatory courses (51.0 credits)**

<table>
<thead>
<tr>
<th>Course code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>ID1019</td>
<td>Programming II</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>ID1020</td>
<td>Algorithms and Data Structures</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>II1305</td>
<td>Project in Information and Communication Technology</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>IK1203</td>
<td>Networks and Communication</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>IV1303</td>
<td>Modern Software Development</td>
<td>6.0</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1686</td>
<td>Calculus in Several Variable</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>SK1118</td>
<td>Electromagnetism and Waves</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
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</table>
### Optional courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID2216</td>
<td>Developing Mobile Applications</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>II1303</td>
<td>Signal Processing</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>II1307</td>
<td>Active Career</td>
<td>1.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>LS1419</td>
<td>English for Employment</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>ME1033</td>
<td>Open and User Innovation</td>
<td>7.5</td>
<td>First cycle</td>
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</table>

### Supplementary information

9 credits elective courses belongs to year 2.

The listed elective courses are suggested elective courses.

### Year 3

**Mandatory courses (49.5 credits)**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG1815</td>
<td>Sustainable Development, ICT and Innovation</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>ID1206</td>
<td>Operating Systems</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>II143X</td>
<td>Degree Project in Information and Communication Technology, First Cycle</td>
<td>15.0</td>
<td>First cycle</td>
</tr>
<tr>
<td>IV1013</td>
<td>Introduction to Computer Security</td>
<td>7.5</td>
<td>First cycle</td>
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<tr>
<td>ME1003</td>
<td>Industrial Management, Basic Course</td>
<td>6.0</td>
<td>First cycle</td>
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<tr>
<td>SF1900</td>
<td>Probability Theory and Statistics</td>
<td>6.0</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

**Optional courses**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD2352</td>
<td>Algorithms and Complexity</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DD2372</td>
<td>Automata and Languages</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DD2401</td>
<td>Neuroscience</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>IC1007</td>
<td>Human-computer Interaction: Principles and Design</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>ID1212</td>
<td>Network Programming</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>ID1214</td>
<td>Artifical Intelligence and Applied Methods</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>ID1217</td>
<td>Concurrent Programming</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>ID2202</td>
<td>Compilers and Execution Environments</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>Course code</td>
<td>Course name</td>
<td>Credits</td>
<td>Edu. level</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------</td>
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</tr>
<tr>
<td>ID2213</td>
<td>Logic Programming</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>ID2216</td>
<td>Developing Mobile Applications</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>II1303</td>
<td>Signal Processing</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>II1307</td>
<td>Active Career</td>
<td>1.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>IK1330</td>
<td>Wireless Systems</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>IK1552</td>
<td>Internetworking</td>
<td>7.5</td>
<td>First cycle</td>
</tr>
<tr>
<td>IK2206</td>
<td>Internet Security and Privacy</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>IS2202</td>
<td>Computer Systems Architecture</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>LS1419</td>
<td>English for Employment</td>
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<td>First cycle</td>
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<tr>
<td>ME1033</td>
<td>Open and User Innovation</td>
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<td>First cycle</td>
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<tr>
<td>ME2063</td>
<td>Team Leadership and Human Resource Management</td>
<td>6.0</td>
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<tr>
<td>SF1811</td>
<td>Optimization</td>
<td>6.0</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

**Supplementary information**

10.5 credits elective courses belongs to year 3.

The listed elective courses are suggested elective courses.

**Year 4**
Appendix 2: Specialisations

Bachelor's Programme in Information and Communication Technology (TCOMK),
Programme syllabus for studies starting in autumn 2019

This programme has no specialisations.