Programme syllabus

Degree Programme in Microelectronics
Civilingenjörsutbildning i mikroelektronik
300.0 credits

Valid for students admitted to the education from autumn 07 (HT - Autumn term; VT - Spring term).

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

Programme objectives

Knowledge and understanding

Skills and abilities

Ability to make judgements and adopt a standpoint

Extent and content of the programme

Eligibility and selection

Implementation of the education

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.

Appendix 1 - Course list
Appendix 2 - Programme syllabus descriptions
## Appendix 1: Course list

Degree Programme in Microelectronics (CMIEL), Programme syllabus for studies starting in autumn 2007

### 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>
</tr>
</thead>
<tbody>
<tr>
<td>ID1004</td>
<td>Object-oriented Programming</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>IE1204</td>
<td>Digital Design</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>IF1611</td>
<td>Engineering Fundamentals</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>IF1612</td>
<td>Applied Physics, Thermodynamics and Waves</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1624</td>
<td>Algebra and Geometry</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1625</td>
<td>Calculus in One Variable</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1626</td>
<td>Calculus in Several Variable</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>SG1108</td>
<td>Applied Physics, Mechanics</td>
<td>7.5 hp</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>II1310</td>
<td>Introduction to Computer Studies</td>
<td>1.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1611</td>
<td>Introductory Course in Mathematics I</td>
<td>1.5 hp</td>
<td>First cycle</td>
</tr>
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</table>

**Recommended courses**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1362</td>
<td>Spoken and Written Swedish</td>
<td>6.0 hp</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

#### Year 2
Mandatory courses (60.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN1215</td>
<td>Numerical Methods, Basic Course</td>
<td>7.5 hp First cycle</td>
</tr>
<tr>
<td>EH1010</td>
<td>Project Course in Electrical Engineering</td>
<td>7.5 hp First cycle</td>
</tr>
<tr>
<td>EI1102</td>
<td>Electrical Circuit Analysis</td>
<td>7.5 hp First cycle</td>
</tr>
<tr>
<td>EI1200</td>
<td>Electromagnetic Field Theory</td>
<td>7.5 hp First cycle</td>
</tr>
<tr>
<td>IH1611</td>
<td>Semiconductor Devices</td>
<td>7.5 hp First cycle</td>
</tr>
<tr>
<td>SF1635</td>
<td>Signals and Systems, part I</td>
<td>7.5 hp First cycle</td>
</tr>
<tr>
<td>SF1648</td>
<td>Partial Differential Equations</td>
<td>7.5 hp First cycle</td>
</tr>
<tr>
<td>SF1649</td>
<td>Vector Analysis and Complex Functions</td>
<td>7.5 hp First cycle</td>
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</table>

Year 3

Mandatory courses (51.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQ1100</td>
<td>Signals and Systems, part II</td>
<td>7.5 hp First cycle</td>
</tr>
<tr>
<td>IE1202</td>
<td>Analog Electronics</td>
<td>7.5 hp First cycle</td>
</tr>
<tr>
<td>IF1621</td>
<td>Quantum Mechanics I</td>
<td>7.5 hp First cycle</td>
</tr>
<tr>
<td>IT161X</td>
<td>Degree Project in Microelectronics and Applied Physics, First Cycle</td>
<td>15.0 hp First cycle</td>
</tr>
<tr>
<td>KD1140</td>
<td>The Concepts of Chemistry</td>
<td>6.0 hp First cycle</td>
</tr>
<tr>
<td>SF1913</td>
<td>Mathematical Statistics</td>
<td>7.5 hp First cycle</td>
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</table>

Conditionally elective courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits Edu. level</th>
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<tbody>
<tr>
<td>DD2400</td>
<td>Cellular and Molecular Biology</td>
<td>15.0 hp Second cycle</td>
</tr>
<tr>
<td>ID1005</td>
<td>Algorithms and Data Structures</td>
<td>7.5 hp First cycle</td>
</tr>
<tr>
<td>IF2692</td>
<td>Statistical Physics</td>
<td>7.5 hp Second cycle</td>
</tr>
<tr>
<td>IS1200</td>
<td>Computer Hardware Engineering</td>
<td>7.5 hp First cycle</td>
</tr>
</tbody>
</table>

Year 4

Supplementary information

Year 4 in the degree programme Information and Communication Technology is equivalent to year 1 in a master’s programme.

For detailed information about the master’s programmes and the courses see Masters programmes (2 yrs).
Year 5

Supplementary information

Year 5 in the degree programme Information and Communication Technology is equivalent to year 2 in a master’s programme.

For detailed information about the master’s programmes and the courses see Masters programmes (2 yrs).

International Profile, Japanese (INJA)

Year 1

Mandatory courses (6.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1380</td>
<td>Elementary Japanese and Japanese Studies</td>
<td>6.0 hp</td>
<td>First cycle</td>
</tr>
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</table>

Year 2

Mandatory courses (6.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1382</td>
<td>Japanese, Advanced Beginners Level I</td>
<td>6.0 hp</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

Year 3

Mandatory courses (9.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1384</td>
<td>Japanese, Advanced Beginners Level II</td>
<td>9.0 hp</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

Supplementary information

Degree project 15 hp first level is compulsory during the spring term.

Year 4

Mandatory courses (9.0 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>DS1386</td>
<td>Japanese, Intermediate Level</td>
<td>9.0 hp</td>
<td>First cycle</td>
</tr>
</tbody>
</table>
International Profile, Chinese (INKI)

Year 1

Mandatory courses (6.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1390</td>
<td>Elementary Chinese and Chinese Studies</td>
<td>6.0 hp  First cycle</td>
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Year 2

Mandatory courses (6.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1392</td>
<td>Chinese, Advanced Beginners Level I</td>
<td>6.0 hp  First cycle</td>
</tr>
</tbody>
</table>

Year 3

Mandatory courses (9.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1394</td>
<td>Chinese, Advanced Beginners Level II</td>
<td>9.0 hp  First cycle</td>
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</tbody>
</table>

Year 4

Mandatory courses (9.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1396</td>
<td>Chinese, Intermediate Level</td>
<td>9.0 hp  First cycle</td>
</tr>
</tbody>
</table>

International Profile (INT)

Year 1

Conditionally elective courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1323</td>
<td>German, Advanced Beginners Level</td>
<td>7.5 hp  First cycle</td>
</tr>
<tr>
<td>DS1339</td>
<td>French, Advanced Beginners Level</td>
<td>7.5 hp  First cycle</td>
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</table>
Year 2

Mandatory courses (27.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1324</td>
<td>Technical German, Intermediate Level</td>
<td>9.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>DS1334</td>
<td>Technical French, Intermediate Level</td>
<td>9.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>DS1348</td>
<td>Technical Spanish, Intermediate Level</td>
<td>9.0 hp</td>
<td>First cycle</td>
</tr>
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</table>

Year 3

Conditionally elective courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
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<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1384</td>
<td>Japanese, Advanced Beginners Level II</td>
<td>9.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>DS1394</td>
<td>Chinese, Advanced Beginners Level II</td>
<td>9.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>DS2326</td>
<td>Technical German, Advanced Level</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DS2336</td>
<td>Technical French, Advanced Level</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DS2349</td>
<td>Technical Spanish, Advanced Level</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>ID1005</td>
<td>Algorithms and Data Structures</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>IF2692</td>
<td>Statistical Physics</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>IS1200</td>
<td>Computer Hardware Engineering</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

Supplementary information

Degree project 15 hp first level is compulsory during the spring term.

Individual Profile (MEX)

Master, Nanotechnology (NTE)

Master, Photonics (PHS)

Master, Scientific Computing (SCC)

Master, System-on-Chip Design (SKK)

Master, Wireless Systems (TLS)
Appendix 2: Specialisations

Degree Programme in Microelectronics (CMIEL), Programme syllabus for studies starting in autumn 2007

International Profile, Japanese (INJA)

International Profile, Chinese (INKI)

International Profile (INT)

Individual Profile (MEX)

Master, Nanotechnology (NTE)

http://www.kth.se/student/kurser/program/tntem/ht10/

Master, Photonics (PHS)

http://www.kth.se/student/kurser/program/tphsm/ht10/

Master, Scientific Computing (SCC)

Master, System-on-Chip Design (SKK)

http://www.kth.se/student/kurser/program/tskkm/ht10/

Master, Wireless Systems (TLS)

http://www.kth.se/student/kurser/program/ttlsm/ht10/

The specialization in Wireless Systems is taught in English and focuses on enabling technologies for wireless systems. It provides a broad curriculum composed of courses on communication theory, signal processing, radio communication and communication networks.

The specialization begins with a few mandatory courses whereafter the students can focus on one of the following three profiles:
• Information Transmission and Processing (I)
• Wireless Networks (W)
• Multimedia Signal Processing (M)

In addition to the technical courses, students are recommended to take one or two classes on project management or leadership, which will be counted towards their degree. Included in the curriculum is also the opportunity to follow some courses at the PhD level.

The graduation requirements are:

• The three (four, for students who have not previously taken EQ1240 or equivalently) mandatory courses
• The mandatory course(s) plus at least two out of three conditionally elective courses, for at least one of the profiles.
• Degree project 30 cr.u.
• A total of at least 90 cr.u. courses, in addition to the degree project.