Programme syllabus

Master's Programme, Interactive Media Technology, 120 credits
Masterprogram, interaktiv medieteknik

120.0 credits

Valid for students admitted to the education from autumn 16 (HT - Autumn term; VT - Spring term).

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

Programme objectives

The aim of the programme is to establish a practical and theoretical basis for work with the design, development and evaluation of interactive and media technology products and services. The complex media landscape of our time is increasingly dependent upon expert knowledge within areas such as signal processing with video streaming, social media, sound and music processing, designing different types of physical interaction platforms, advanced data visualization as well as media technology from a sustainable perspective.

The programme provides students with a broad range of industry-oriented competence and the possibility for research-based specialisation in the aforementioned areas.

Knowledge and understanding

The Master's Programme in Interactive Media Technology provides an academic deepening within interactive solutions and technologies, with focus on the design, development of technology and studies of media technology solutions in day-to-day use.

Furthermore, the programme provides the basic knowledge and ability needed to solve technical, organisational, methodological, design-based and user-related problems and challenges faced within media technology.

The programme curriculum contributes knowledge about the technological and multi-disciplinary basis of the media and their technology.

Throughout the programme, students will receive in-depth knowledge about human cognition and perceptions of design processes and about technology and research within the multi-modal interface as well as on theories and methods for analysing and understanding specific situations and specific user groups. As part of the programme framework, students will be provided with specific knowledge of how to meet the various requirements of user interfaces for different types of applications and users.
Skills and abilities

The Master's Programme in Interactive Media Technology will provide the students the necessary foundations to adopt a holistic approach to independently and creatively identify, formulate and manage complex issues, and analysing and critically evaluating different technological, organisational and design-based solutions.

The programme will provide the basis for further study at third-cycle level as well as the ability to participate in research and development work, hence contributing to the development of knowledge within the field. As part of the programme, students will develop insight and ability in working in groups that have been brought together in different ways. They will also develop an ability to identify their need for further knowledge and to continually develop their skills and abilities.

Ability to make judgements and adopt a standpoint

The aim of the programme is for the student to be able to evaluate the quality of academic studies and display a reflective and critical attitude to academic and non-academic texts; through personal development maintain their professional ability throughout their career, follow discussions about technology in society and make personal contributions to them.

In addition to this, the similar aims defined in the Higher Education Ordinance apply.

Extent and content of the programme

The programme is at second cycle level and comprises 120 credits. 120 credits is the equivalent of two years' full-time study. The programme is taught in English.

Currently, the programme has seven optional blocks, of which one is to be chosen:

- Computer graphics and visualization
- Human-Computer interaction
- Sound and music
- Interaction technology
- Interaction design
- Social media technologies
- Image and Video technology

Eligibility and selection

The specific eligibility requirements for the Master's Programme in Interactive Media Technology are: a Bachelor of Science or a Bachelor of Science in Engineering/Bachelor's degree within Computer Science, Information Technology, Media Technology or equivalent. The students must have basic knowledge of programming/computer science corresponding to a minimum of 12 credits, and have completed a basic course of at least 6 credits within human-computer interaction.

In addition to the specific eligibility requirements, the optional blocks, "Social Media Technologies", "Sound and Music" and "Image and Video Technology" has additional requirements (courses in algebra,
calculus in one- or several variables, probability and mathematical statistics) of at least 30 credits. KTH does not provide these courses in English.

The specific eligibility requirements can be deemed unfulfilled if the applicant's average grade falls in the lower third of the grading scale from the applicant's recognised university body (above the “pass” level). For example, below C at universities with the A-F grading scale.

Selection: If the number of applicants exceeds the number of available places, the programme committee will perform a selection process based on the following criteria:

1. evaluation of the university
2. grades from previous studies
3. motivation to study
4. merit rating
5. references
6. English language skills

Implementation of the education

Structure of the education

This study plan was established by the Dean of School on 15/09/2015 and applies to students commencing the programme in the academic year of 2016/2017. The courses to be included in each academic year are established during the autumn of the year prior to when the course will be given. See “Year 1” etc. or the appendices. Changes can be made to the programme's content and KTH's regulations, see www.kth.se/student

The academic year consists of 40 weeks, divided into four periods. Where necessary, teaching can be arranged outside of the academic year.

The division of the academic year is stipulated on the KTH website for students (http://www.kth.se/student/schema/).

The programme is made up of three course blocks that are read partially in parallel over two years: compulsory courses for all students on the programme, an elective block with two compulsory courses which make up a specialisation within one of the programme's central areas and a block of conditionally elective courses of at least 15 credits.

The programme concludes with a 30 credit degree project.

Other courses are optional.

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

The various aims, pre-requisites, content and course requirements can be found in the study plans in the Course and Programme Directory on the KTH website for students. Each year group has a list of the included courses.

The following limitations apply to the elective courses:

- There can be a limit imposed on the number of credits that may be taken per semester.
- Elective courses may not significantly overlap with the existing programme courses.
- A subject course on a level that is lower than the existing programme course may not be included as an elective course.

Examinations are conducted in various ways, for example: exercises completed at home and then presented orally or in writing; laboratory work; project work or written examinations.

After each course, student feedback is collected and analysed by the course coordinator. Feedback is presented as a course analysis that is usually published online. See the KTH regulations for course analyses http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/kursanalys

**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**

**Semester registration:**

At the start of each semester, the student is required to register via the Personal Menu. Semester registration is required to participate in new courses, for study results to be registered and for CSN to issue student funding.

**Choice of specialisation:**

Choice of specialisation is made as per instruction from the School of Computer Science and Communication.

**Choice of courses**

*Application for admittance to course:*

The student is obligated to apply for admission to all the courses the student wishes to study in the following semester.
It is the student's responsibility to ensure they fulfil the recommended knowledge pre-requisites. Application for admission to the course must be done in accordance with instructions from the School of Computer Science and Communication, no later than

- 15 May for the autumn semester,
- 15 November for the spring semester

Applications submitted after the deadline are considered subject to availability of space. Before applying for admission to a language course, a test concerning level placement should be conducted.

A small number of courses have limited places. For such courses, selection is merit-based, from grades and points for those students who have applied in time. The selection is conducted by the school offering the course.

Students may only take part in the courses included in the student's study plan.

**Course registration:**

The student is to register for each course at the start of the course. Course registration on both compulsory and elective courses must be done individually. Those who have registered on a course and then decide to not complete the course must remove the course registration via the Personal Menu. If the student does not do this, they must complete the course.

Course registration presupposes that the student has been admitted to the course.

**Requirements for advancement:**

To advance to the second year of the programme, the student must have completed a minimum of 45 credits from the first year.

Students who have fallen behind in their studies and do not meet the above requirements must, in consultation with the programme's Study Guidance, establish an individual study plan for the continuing studies.


**Recognition of previous academic studies**

Students have the opportunity to be given credit for results from a course or courses at another higher education institution/university within or outside Sweden. The form can be found on the KTH website for students. Application for a credit transfer shall be submitted to study guidance at CSC. The KTH policy for credit transfers can be found in its entirety in the KTH regulations:

http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/prestationer/

**Studies abroad**
Students on the programme have the opportunity to study abroad for one semester via the agreements KTH has with universities within and outside the EU. It is also possible to write the degree project abroad. For more information, contact the International Co-ordinator at CSC. More information can be found on the KTH website for students and via http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/utbytesstudier

**Degree project**

The programme includes a thesis for the Degree of Master of Science in Engineering/Degree of Master of Science which corresponds to 30 credits.

The student is responsible for finding a suitable task for their own degree project. KTH’s comprehensive rules and guidelines for a thesis, 30 credits, for a Degree of Master of Science, 300 credits, as well as how the thesis is graded, can be found in the KTH regulations: http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/examensarbete/

In addition to the requirements set for beginning the degree project, for the students following a Master of Engineering programme, the requirements for the Master of Engineering programme apply.

**Degree**

Once the student has completed the entire programme, they can apply for a Teknologie Masterexamen (Degree of Master of Science).

Instructions for how to apply for the degree can be found on the KTH student website.

**Conditions for the Degree of Master of Science**

A Degree of Master of Science is awarded after completion of the programme. The programme is designed so that the student, having earned their degree, meets the national examination requirements and those set by KTH for the Degree of Master of Science.

See KTH’s regulations http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/examina/

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

Master's Programme, Interactive Media Technology, 120 credits (TIMTM), Programme syllabus for studies starting in autumn 2016

General courses

Year 1

Mandatory courses (19.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM2678</td>
<td>Program Integrating Course in Interactive Media Technology</td>
<td>4.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DM2700</td>
<td>Introduction to Interactive Media Technology</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DM2711</td>
<td>Research Methods in Interactive Media Technology</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
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</table>

Conditionally elective courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD2257</td>
<td>Visualization</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DD2424</td>
<td>Deep Learning in Data Science</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DD2425</td>
<td>Robotics and Autonomous Systems</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DD2429</td>
<td>Computational Photography</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2321</td>
<td>Information Visualization</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2323</td>
<td>Computer Graphics and Interaction</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2400</td>
<td>Physical Interaction Design and Realization</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2408</td>
<td>Evaluation Methods in Human-Computer Interaction</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2413</td>
<td>Advanced Graphics and Interaction</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2466</td>
<td>Advanced Individual Course in Human-Computer Interaction</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2625</td>
<td>IT-design for the Disabled</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2627</td>
<td>Interaction Design 2</td>
<td>15.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2628</td>
<td>Interaction Design Methods</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2629</td>
<td>Interaction Design as a Reflective Practice</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2632</td>
<td>Human-Computer Interaction, Research Seminars</td>
<td>3.0 hp</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>
DH2642 Interaction Programming and the Dynamic Web  7.5 hp  Second cycle
DH2650 Computer Game Design  6.0 hp  Second cycle
DH2660 Haptics  6.0 hp  Second cycle
DM2500 Telepresence Production  7.5 hp  Second cycle
DM2517 XML for Publishing  7.5 hp  Second cycle
DM2518 Mobile Development with Web Technologies  7.5 hp  Second cycle
DM2573 Compulsory for students in the "civilingenjörsprogram i Medieteknik"  7.5 hp  Second cycle
DM2574 Media Production  9.0 hp  Second cycle
DM2578 Social Media Technologies  7.5 hp  Second cycle
DM2582 Media Lab  7.5 hp  Second cycle
DM2720 Sustainable ICT in Practice  7.5 hp  Second cycle
DM2904 Individual Course in Media Technology  6.0 hp  Second cycle
DM2905 Individual Course in Media Technology  7.5 hp  Second cycle
DT2112 Speech Technology  7.5 hp  Second cycle
DT2119 Speech and Speaker Recognition  7.5 hp  Second cycle
DT2140 Multimodal Interaction and Interfaces  7.5 hp  Second cycle
DT2213 Musical Communication and Music Technology  7.5 hp  Second cycle
DT2300 Sound in Interaction  7.5 hp  Second cycle
DT2410 Audio Technology  7.5 hp  Second cycle
SK2376 Optics, Supplementary Course  7.5 hp  Second cycle

Supplementary information

Compulsory courses, year 1:

DM2573 is compulsory for students admitted to CMETE. It does not count as a conditionally elective course for CMETE.

15 credits from the conditionally elective courses must be taken.

Year 2

Mandatory courses (71.5 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits Edu. level</th>
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</thead>
<tbody>
<tr>
<td>DA221X</td>
<td>Degree Project in Computer Science and Communication, Second Cycle</td>
<td>30.0 hp  Second cycle</td>
</tr>
<tr>
<td></td>
<td>For students admitted to a Master programme at CSC</td>
<td></td>
</tr>
<tr>
<td>DA222X</td>
<td>Degree Project in Computer Science and Communication, Second Cycle</td>
<td>30.0 hp  Second cycle</td>
</tr>
</tbody>
</table>
Engineering students admitted to a master programme at CSC

**DM2678** Program Integrating Course in Interactive Media Technology  4.0 hp  Second cycle
**DM2799** Advanced Projectcourse in Interactive Media Technology  7.5 hp  Second cycle

**Conditionally elective courses**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD2429</td>
<td>Computational Photography</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2320</td>
<td>Introduction to Visualization and Computer Graphics</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2400</td>
<td>Physical Interaction Design and Realization</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2413</td>
<td>Advanced Graphics and Interaction</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2627</td>
<td>Interaction Design 2</td>
<td>15.0 hp</td>
<td>Second cycle</td>
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<tr>
<td>DH2655</td>
<td>Cooperative IT-design</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DM2350</td>
<td>Human Perception for Information Technology</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DM2500</td>
<td>Telepresence Production</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DM2517</td>
<td>XML for Publishing</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DM2573</td>
<td>Sustainability and Media Technology</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DM2574</td>
<td>Media Production</td>
<td>9.0 hp</td>
<td>Second cycle</td>
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<tr>
<td>DM2578</td>
<td>Social Media Technologies</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DM2582</td>
<td>Media Lab</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DT2140</td>
<td>Multimodal Interaction and Interfaces</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DT2300</td>
<td>Sound in Interaction</td>
<td>7.5 hp</td>
<td>Second cycle</td>
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</tbody>
</table>

**Supplementary information**

At least 15 credits of the conditionally elective courses from year one and year two must be taken.

**Track, Computer Graphics and Visualisation (IMCG)**

**Year 1**

**Mandatory courses (6.0 Credits)**

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<th>Course name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>DH2320</td>
<td>Introduction to Visualization and Computer Graphics</td>
<td>6.0 hp</td>
<td>Second cycle</td>
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**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>DH2321</td>
<td>Information Visualization</td>
<td>6.0 hp</td>
<td>Second cycle</td>
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</table>
Year 2

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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<tbody>
<tr>
<td>DH2413</td>
<td>Advanced Graphics and Interaction</td>
<td>9.0 hp</td>
<td>Second cycle</td>
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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>
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<tbody>
<tr>
<td>DD2257</td>
<td>Visualization</td>
<td>7.5 hp</td>
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<td>DD2429</td>
<td>Computational Photography</td>
<td>6.0 hp</td>
<td>Second cycle</td>
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<td>DH2320</td>
<td>Introduction to Visualization and Computer Graphics</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2408</td>
<td>Evaluation Methods in Human-Computer Interaction</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2466</td>
<td>Advanced, Individual Course in Human-Computer Interaction</td>
<td>6.0 hp</td>
<td>Second cycle</td>
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<tr>
<td>DH2632</td>
<td>Human-Computer Interaction, Research Seminars</td>
<td>3.0 hp</td>
<td>Second cycle</td>
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<tr>
<td>DH2650</td>
<td>Computer Game Design</td>
<td>6.0 hp</td>
<td>Second cycle</td>
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<tr>
<td>DM2560</td>
<td>Media Management, practice module</td>
<td>7.5 hp</td>
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<tr>
<td>DM2561</td>
<td>Media Management</td>
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<td>DM2904</td>
<td>Individual Course in Media Technology</td>
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<td>Second cycle</td>
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<td>DM2905</td>
<td>Individual Course in Media Technology</td>
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<td>Second cycle</td>
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<tr>
<td>DT2140</td>
<td>Multimodal Interaction and Interfaces</td>
<td>7.5 hp</td>
<td>Second cycle</td>
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Track, Human-Computer Interaction (IMHI)
Year 1

Supplementary information

The track Human Computer Interaction is cancelled the academic year 2016/2017 according to the decision D-2015-798.

Track, Interaction Design (IMID)

Year 1

Mandatory courses (15.0 Credits)

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<thead>
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<th>Edu. level</th>
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<tbody>
<tr>
<td>DH2628</td>
<td>Interaction Design Methods</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2629</td>
<td>Interaction Design as a Reflective Practice</td>
<td>7.5 hp</td>
<td>Second cycle</td>
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Recommended courses

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<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DH2321</td>
<td>Information Visualization</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DH2323</td>
<td>Computer Graphics and Interaction</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
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<td>DH2408</td>
<td>Evaluation Methods in Human-Computer Interaction</td>
<td>6.0 hp</td>
<td>Second cycle</td>
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<tr>
<td>DH2625</td>
<td>IT-design for the Disabled</td>
<td>6.0 hp</td>
<td>Second cycle</td>
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<tr>
<td>DH2632</td>
<td>Human-Computer Interaction, Research Seminars</td>
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<tr>
<td>DH2642</td>
<td>Interaction Programming and the Dynamic Web</td>
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<td>Second cycle</td>
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<tr>
<td>DH2650</td>
<td>Computer Game Design</td>
<td>6.0 hp</td>
<td>Second cycle</td>
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<tr>
<td>DH2660</td>
<td>Haptics</td>
<td>6.0 hp</td>
<td>Second cycle</td>
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<td>DM2518</td>
<td>Mobile Development with Web Technologies</td>
<td>7.5 hp</td>
<td>Second cycle</td>
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<td>DM2573</td>
<td>Sustainability and Media Technology</td>
<td>7.5 hp</td>
<td>Second cycle</td>
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<tr>
<td>DM2720</td>
<td>Sustainable ICT in Practice</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
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<td>DT2140</td>
<td>Multimodal Interaction and Interfaces</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>DT2300</td>
<td>Sound in Interaction</td>
<td>7.5 hp</td>
<td>Second cycle</td>
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Year 2

Recommended courses

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<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
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<tbody>
<tr>
<td>DH2400</td>
<td>Physical Interaction Design and Realization</td>
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### Track, Interaction Technology (IMIT)

#### Year 1

**Mandatory courses (7.5 Credits)**

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**Track, Image and Video Technology (IMIV)**

**Year 1**

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**Track, Sound and Music Computing (IMLM)**

**Year 1**

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**Track, Social Media Technology (IMTS)**
## Year 1

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Appendix 2: Specialisations

Master's Programme, Interactive Media Technology, 120 credits (TIMTM), Programme syllabus for studies starting in autumn 2016

Track, Computer Graphics and Visualisation (IMCG)

This track provides specialized knowledge of methods, technologies and tools for interactive graphics and visualization. Starting with a deep understanding of the foundational theories, this track allows students to get hands-on practical experience in creating new and analyzing existing graphics solutions. The track covers a wide range of applicability from game design, over crowd simulation to interactive infographics.

Track, Human-Computer Interaction (IMHI)

Track, Interaction Design (IMID)

This track provides advanced studies in methods, techniques and tools for the design of interactive systems based on the experience and user-centered perspective. The focus also aims to provide deeper knowledge of methodology for evaluation and analysis of interactive systems in real use contexts. This is also a preparation for the thesis performed with design-driven approach.

Track, Interaction Technology (IMIT)

Students learn to develop interactive systems with modern development methodology, focusing on technical material know-how in different hardware platforms and technologies.

Track, Image and Video Technology (IMIV)

This track provides specialised knowledge of computational models, methods, and technologies for image and video technology. In this track the students will practise the methodological knowledge in doing image and video related project work. By working on the real-world problems, the students will build competencies on advanced image processing, video compression, and object recognition in digital images.

Track, Sound and Music Computing (IMLM)

Track, Social Media Technology (IMTS)
The track provides a deepening in the technology related to social media, such as the handling and analysis of large information flows (big data), designed for dynamic web and mobile devices, as well as knowledge about the human and social aspects of modern information technology.