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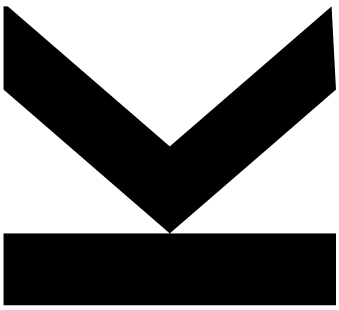
CURRICULUM GUIDE
MASTER IN
# COMPUTER SCIENCE.



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# 1 Qualification profile

The Master's program in Computer Science at the Johannes Kepler University (JKU) Linz comes with six areas of specialization: *Computational Engineering*, *Data Science*, *Intelligent Information Systems*, *Networks and Security*, *Pervasive Computing*, and *Software Engineering*. Graduates have acquired in-depth knowledge of the selected area of specialization in addition to a broad skill set for problem solving.

### General profile

Computer Science encompasses concepts, methods, and tools for systematic and automated information processing. Its roots lie in mathematics and electrical engineering. Today, computer science is an established scientific discipline in its own right, and permeates numerous aspects of business and technology as well as our daily life.

The Master's program in Computer Science aims at fostering problem solving skills. Based on the foundations of computing, covered by the Bachelor's program in Computer Science at JKU, the Master's program offers research-oriented education in contemporary areas of computer science. Graduates are experts in their area of specialization. They are equipped with a solid background in information technology, and are capable of solving complex IT problems using scientific methods.

Computer Science at JKU distinguishes itself as an application-oriented engineering discipline with a balanced emphasis on theory and practice. Besides cultivating technical skills, the curriculum's educational mission accentuates proficiency in scientific methods, creativity, multidisciplinarity, team spirit, social skills as well as leadership skills, and prepares for life-long learning.

### Computational Engineering

Computer Science continues to be a fast growing discipline. It is shaping our lives by enabling new technologies well beyond the traditional engineering of technical and physical systems. At JKU the specialization of Computational Engineering focuses on discrete methods of modelling and computation in informatics and mathematics, and their applications to innovative engineering disciplines from computer systems and robotics to biological systems and fine arts. The Master's program emphasizes the value of new computational methods as a driver for entirely new areas of engineering, and prepares graduates with foundational knowledge to solve problems within the broad arena of systems engineering.

### Data Science

Recent advances in data analytics along with rapidly growing amounts of data allow for completely new opportunities to solve hard real-world problems in a data-driven manner. This is impressively demonstrated by the latest achievements in, e.g., genome analysis, image recognition in self-driving cars, or situation detection in crisis events. Data science is an interdisciplinary field at the interface between computer science and statistics dealing with huge amounts of multivariate, heterogeneous data, which gets analysed and interpreted in order to draw adequate decisions. The specialization in Data Science aims at providing an understanding of fundamental technologies such as machine learning, pattern recognition, data mining, data visualization and big data management, both from a computer science and statistics perspective, and accompanies them by the necessary background in database and software technologies. Data scientists are highly demanded in industry across various domains, such as, medicine, smart production, finance and marketing.

### Intelligent Information Systems

The large amounts of structured, unstructured, or multimedia data produced in various domains, especially the World Wide Web, require intelligent strategies for analysis, semantic modelling, processing, retrieval, extraction, and integration of information. Intelligent information systems require engineering approaches, concepts, methods, and tools for information and services provided in a machine-interpretable way. This includes areas like relational databases, web information systems, non-standard storage, (Web) search strategies, data and web mining, social/semantic web intelligence, pattern recognition, artificial intelligence, recommendation systems, personalized and context-aware systems, and cooperative situation awareness. Additionally, eAccessibility and assistive technologies have become key aspects of

intelligent information systems. Comprehensive competences in these fields enable graduates to work in both research and development, in industry as well as in high-profile research facilities around the world.

**Networks and Security**

The protection of IT systems against internal or external attacks is a strategically important task for planning and operating such systems. Industry and economy require more security experts with a profound knowledge in computer science and especially networks. Important aspects in the application of security measures are the systematic configuration and monitoring of IT infrastructures. Graduates of this specialization area have broad job opportunities ranging from the design, implementation, and administration of security strategies, the administration of systems, networks, and security policies, the application of cryptography as well as knowledge of the legal environment in the security area. The profound technical education in this area allows a career in research and development alike.

**Pervasive Computing**

The design of miniaturized systems, which are invisibly integrated in their environment and are connected in a spontaneous and wireless way require special computer science methods. The specialization in Pervasive Computing therefore deals with a combination of technologies (e.g., sensors, actuators, wireless communication, miniaturized memories and processors), paradigms (e.g., context-aware and adaptive systems, autonomous and self-organizing systems, organic and bio-inspired systems) and methods (e.g., for interaction, coordination, computational perception, reasoning and learning, artificial intelligence, virtual reality, semantic interoperability, system reliability, security, and user friendliness). The educational goals are decision and evaluation skills as well as skills for designing and developing pervasive computing systems such as "information appliances", "wearable systems", or "ambient intelligence systems".

**Software Engineering**

Business and industry have a considerable demand for well-trained software engineers who are able to manage large software projects, to apply cutting-edge software development techniques as well as to understand and to direct all phases of the software development process. The specialization in Software Engineering aims at educating such experts. It covers formal foundations as well as methods and tools for all project phases, such as requirements engineering, system modelling, architectural design, implementation, testing, deployment, and maintenance of software systems. The focus is on scientific methods and their application in building high-quality software in an economic way. Since most Computer Science graduates work in software development, a specialization in Software Engineering is an excellent preparation for their professional career.

## Further Information

- Home page of CS @ JKU — cs.jku.at
- Announcements of the curriculum committee — cs.jku.at/teaching/stuko/news/
- Study handbook with course descriptions — studienhandbuch.jku.at
- Official curriculum — cs.jku.at/teaching/
- Admission — cs.jku.at/teaching/master/admissionFAQs.html

This guide serves as the major source of information for students. The full legal provisions for this Master's program can be found in the official curriculum.

# 2 Overview

## 2.1 General structure

The Master's program in Computer Science is a two years' full-time program comprising 120 ECTS points. It is delivered in English. Table 1 shows its overall structure.

**Table 1**: *Master's program in Computer Science*

| | hours/week | ECTS |
|---|---|---|
| Major Subject | 25 | 37.5 |
| Complementary Subject | 18 | 27.0 |
| Free Electives | 8 | 12.0 |
| Master's Thesis Seminars | 6 | 16.0 |
| Master's Thesis | | 25.0 |
| Master's Examination | | 2.5 |
| *Total* | *57* | *120.0* |

The *Major Subject* is the core of the curriculum. It can be selected from five areas of specialization:

- Computational Engineering
- Data Science
- Intelligent Information Systems
- Networks and Security
- Pervasive Computing
- Software Engineering

All courses of the selected Major Subject have to be passed.

The *Complementary Subject* allows students to extend their Computer Science skills beyond the Major Subject. Students can freely select courses from other areas of specialization or from a catalogue of elective courses.

The *Free Electives* are courses that can be chosen from all degree programs at any university. They give students the opportunity to educate their personality and to acquire skills beyond Computer Science.

The *Master's Thesis* is the final project in this program. It is a scientific thesis, in which the knowledge and skills obtained during the study should be demonstrated. The *Master's Thesis Seminars* serve to prepare and guide the composition of the Master's Thesis. These seminars are compulsory courses.

## 2.2 Admissions

Graduates of the JKU Bachelor's program *Informatik* are admitted without restrictions. For bachelors of the JKU studies *Wirtschaftsinformatik* and *Elektronik und Informationstechnik* there is a list of courses from the Bachelor's program in Informatik that have to be attended as part of the Complementary Subject (see the web).

Graduates of Computer Science or related programs at other universities, universities of applied sciences, and other post-secondary educational institutions can be admitted if their degree programs are equivalent to the Bachelor's program in Informatik at JKU. Differences between programs can be compensated by replacing one or more courses from the Complementary Subject with courses specified in the notification of admission. If equivalence cannot be fully established the notification of admission can require additional courses with up to 20 ECTS points.

Candidates have to apply at the JKU Admissions Office. Further information can be obtained from www.jku.at/en/studying/studies-from-a-z/admission-procedures/admission-to-a-masters-degree-program/ and from cs.jku.at/teaching/master/admissionFAQs.html.

### 2.3 Academic degree

Graduates are awarded the academic degree "Diplom-Ingenieurin" or "Diplom-Ingenieur", abbreviated "Dipl.-Ing.", "Dipl.-Ing. (JKU)", "DI", or "DI (JKU)". This corresponds to the international degree "Master of Science" (MSc), although the MSc degree is not conferred.

### 2.4 Course types

*Lectures* ("Vorlesungen", VO) are courses that introduce students to certain areas and methods of their study.

*Labs* ("Übungen", UE) are courses which reinforce topics from the corresponding lecture by carrying out practical and concrete exercises. Marking is based on continuous assessment of the students' work.

*Combined courses* ("Kombinierte Veranstaltungen", KV) are courses consisting of lectures and labs, which are intertwined according to didactic aspects.

*Practicals* (PR) have similar goals as labs and are continuously assessed. In contrast to labs they can be independent from lectures and usually promote project-oriented work in a team.

*Seminars* (SE) are courses involving collaboration between students. Marking of seminars is based on continuous assessment of the students' work, on their preparation of talks (including seminar papers) and on their participation in discussions.

### 2.5 ECTS points

In line with the *European Credit Transfer System* (ECTS) 1 ECTS point corresponds to 25 full hours of work. This includes the attendance of courses as well as the time for preparation, exercises, and practical work at home. The total effort of this Master's program is 120 ECTS points, or 30 ECTS points per semester. With a few exceptions, 1 weekly hour of teaching is worth 1.5 ECTS points.

Lecturers have to adjust the effort of every course such that it matches the ECTS points of the course, where corresponding lectures and labs are considered as a unit.

### 2.6 Number of students per course

In courses of the Major Subject 35 students are admitted to labs, 15 students are admitted to practicals, and 20 students are admitted to seminars. Combined courses as well as electives do not have parallel groups.

## 3 Major Subject

For the Major Subject students have to select one of six areas of specialization listed in Table 2 and have to take all courses listed in the selected area.

**Table 2**: *Mandatory courses and areas of specialization (WS = winter semester, SS = summer semester)*

| Areas of specialization | | Lecturer | ECTS | WS/SS |
|---|---|---|---|---|
| **Computational Engineering** | | | | |
| Model Checking | 3KV | Biere | 4.5 | WS |
| Machine Learning: Supervised Techniques | 2VO+1UE | Hochreiter | 4.5 | WS |
| Probabilistic Models | 2VO(+1UE) | Widmer | 3.0 | WS |
| System Software | 2KV | Mössenböck | 3.0 | WS |
| Parallel Computing | 3KV | Biere, Schreiner | 4.5 | SS |
| Hardware Design | 3KV | Wille | 4.5 | SS |
| Computer Algebra for Concrete Mathematics | 2VO(+1UE) | Paule | 3.0 | SS |
| Project in Computational Engineering | 5PR | | 7.5 | WS/SS |
| Seminar in Computational Engineering: ... | 2SE | | 3.0 | WS/SS |

| | | | | |
|---|---|---|---|---|
| **Data Science** | | | | |
| Machine Learning: Supervised Techniques | 2VO | Hochreiter | 3.0 | WS |
| Probabilistic Models | 2VO(+1UE) | Widmer | 3.0 | WS |
| Visual Analytics | 2VO | Streit | 3.0 | WS |
| Statistical Principles of Data Science | 3KV | Futschik | 6.0 | WS |
| Data Warehousing | 2VO+2UE | Schütz | 6.0 | WS |
| Big Data Management and Processing | 2KV | Pröll et al. | 3.0 | SS |
| Computational Data Analytics | 2KV | Fürnkranz | 3.0 | SS |
| Project in Data Science | 5PR | | 7.5 | WS/SS |
| Seminar in Data Science: ... | 2SE | | 3.0 | WS/SS |
| **Intelligent Information Systems** | | | | |
| Knowledge Based Systems | 2KV | Küng | 3.0 | WS |
| Information Retrieval and Extraction | 2KV | Pröll | 3.0 | WS |
| Basic Methods of Data Analysis | 2KV | Kofler,Hochreiter | 3.0 | WS |
| Multimedia Search and Retrieval | 3KV | Schedl, Arzt | 4.5 | WS |
| Integrated Information Systems | 2KV | Wöß | 3.0 | SS |
| Learning from User-generated Data | 3KV | Schedl | 4.5 | SS |
| Web Information Systems | 3KV | Retschitz., Kaps. | 4.5 | SS |
| Accessible Software and Web Design | 1KV | Miesenberger | 1.5 | SS |
| Project in Intelligent Information Systems | 5PR | | 7.5 | WS/SS |
| Seminar in Intelligent Information Systems: ... | 2SE | | 3.0 | WS/SS |
| **Networks and Security** | | | | |
| Introduction to IT Security | 2VO | Mayrhofer | 3.0 | WS |
| Information Security Management | 2VO | Weippl | 3.0 | WS |
| Computer Forensics and IT Law | 2VO | Sonntag | 3.0 | WS |
| System Administration | 2KV | Hörmanseder | 3.0 | WS |
| Systems Security | 2KV | Nguyen | 3.0 | SS |
| Secure Code | 1KV | INS | 1.5 | SS |
| Network Management | 2KV | Hörmanseder | 3.0 | SS |
| Network Security | 1KV | Hörmanseder | 1.5 | SS |
| Cryptography | 2KV | Scharinger | 3.0 | SS |
| Security Models in Information Systems | 2KV | Küng | 3.0 | SS |
| Project in Networks and Security | 5PR | | 7.5 | WS/SS |
| Seminar in Networks and Security: ... | 2SE | | 3.0 | WS/SS |
| **Pervasive Computing** | | | | |
| Pervasive Comp.: Systems and Environments | 2VO+1UE | Ferscha | 4.5 | WS |
| Pervasive Comp.: Design and Development | 2VO+1UE | Ferscha | 4.5 | WS |
| Computer Vision | 2VO+1UE | Bimber | 4.5 | WS |
| Principles of Interaction | 2VO+1UE | Kotsis et al. | 4.5 | SS |
| Principles of Cooperation | 2VO+1UE | Kotsis | 4.5 | SS |
| Machine Learning and Pattern Classification | 2VO+1UE | Widmer | 4.5 | SS |
| Project in Pervasive Computing | 5PR | | 7.5 | WS/SS |
| Seminar in Pervasive Computing: ... | 2SE | | 3.0 | WS/SS |
| **Software Engineering** | | | | |
| Formal Methods in Software Development | 3KV | Schreiner | 4.5 | WS |
| Requirements Engineering | 2KV | Grünbacher | 3.0 | WS |
| Principles of Programming Languages | 2KV | Prähofer | 3.0 | WS |
| System Software | 2KV | Mössenböck | 3.0 | WS |
| Software Architectures | 3KV | Weinreich | 4.5 | SS |
| Model-driven Engineering | 2KV | Egyed | 3.0 | SS |
| Software Testing | 2KV | Plösch, Ramler | 3.0 | SS |
| Software Processes and Tools | 2KV | Grünbacher | 3.0 | SS |
| Project in Software Engineering | 5PR | | 7.5 | WS/SS |
| Seminar in Software Engineering: ... | 2SE | | 3.0 | WS/SS |

**Practical and Seminar**

Each area of specialization has a practical (5 hours) and a seminar (2 hours). The practical serves as a consolidation and an application of the skills acquired in the respective area. It is usually organised as a team work. The seminar should rehearse scientific working principles. Its name is "Seminar in *A*" (where *A* is the name of the area of specialization) with an appropriate subtitle denoting the topic of the seminar. The seminar is also part of the seminar catalogue in Table 4.

# 4 Complementary Subject

The Complementary Subject allows students to deepen and/or broaden their computing skills according to their special interests. Students have to select courses with a total of 18 hours (27 ECTS) from the following categories (they are strongly expected to select 3 ECTS points from Gender Studies):

- Areas of specialization that were not selected as the Major Subject (projects excluded)
- General Electives as described in Section 4.1
- Special Topics as described in Section 4.2
- Seminars as described in Section 4.3
- Gender Studies as described in Section 4.4

## 4.1 General Electives

The General Electives comprise the courses listed in Table 3. Courses that have already been taken in the Bachelor's program cannot be selected in the Master's program. The General Electives are regularly offered at least every two years.

**Table 3**: *General Electives (* = offered every second year)*

| Inst. | Courses | | Lecturer | ECTS | WS/SS |
|---|---|---|---|---|---|
| CG | Explainable AI | 1VO+1UE | Streit | 3.0 | WS |
| | Information Displays | 2VO | Bimber | 3.0 | SS* |
| | Information Visualization | 3KV | Streit | 4.5 | SS |
| | Visual Analytics | 1UE | Streit | 1.5 | WS |
| CP | Biometrische Identifikation | 2VO | Scharinger | 3.0 | WS |
| | Digitale Bildverarbeitung | 2KV | Scharinger | 3.0 | SS |
| | Probabilistic Models | 1UE | Widmer | 1.5 | WS |
| | Reinforcement Learning | 2VO+1UE | Widmer | 4.5 | WS |
| FAW | Application Oriented Knowledge Processing | 2KV | Küng | 3.0 | SS |
| | Conceptual Data Modeling | 2KV | Wöß | 3.0 | SS |
| | Semantic Data Modeling and Applications | 2KV | Wöß | 3.0 | SS |
| | Symbolic AI | 2VO+1UE | Fürnkranz, Küng | 4.5 | SS |
| | Web Search and Mining | 2KV | Pröll | 3.0 | SS |
| | Web Engineering | 2KV | Pröll | 3.0 | WS |
| FMV | Debugging | 2KV | Seidl | 3.0 | SS* |
| | SAT Solving | 2KV | Biere | 3.0 | SS* |
| ICA | Statistics 2 | 2KV | Forstner | 3.0 | WS/SS |
| IIC | Emerging Computer Technologies | 3KV | Wille | 4.5 | WS |
| | VLSI Design | 2KV | Schmickl | 3.0 | WS |
| IIS | Assistive Technologies and Accessibility | 2KV | Miesenberger | 3.0 | WS |
| | Web Usability | 1KV | Miesenberger | 1.5 | WS |
| INS | Cloud Security | 2KV | Mayrhofer | 3.0 | WS |
| | Hardwareorientiertes Arbeiten an PCs | 2PR | Bauer | 3.0 | WS* |
| | Sicherheit in Applikationsprotokollen | 1KV | Dietmüller | 1.5 | WS |
| | Web Security | 2KV | Sonntag | 3.0 | SS |
| | Wireless LANs | 1KV | Schmitzberger | 1.5 | SS |

| | | | | | |
|---|---|---|---|---|---|
| ISSE | Engineering of Software-intensive Systems | 2KV | Egyed | 3.0 | SS |
| | Product Line Engineering | 2KV | Grünbacher | 3.0 | SS |
| ML | Deep Learning and Neural Nets I | 2VO+1UE | Klambauer | 4.5 | WS |
| | Machine Learning: Supervised Techniques | 1UE | Hochreiter | 1.5 | WS |
| | Machine Learning: Unsupervised Techniques | 2VO+1UE | Hochreiter et al. | 4.5 | SS |
| | Natural Language Processing | 2KV | Rekabsaz | 3.0 | WS |
| | Sequence Analysis and Phylogenetics | 2VO+2UE | Klambauer | 6.0 | WS |
| | Theoretical Concepts of Machine Learning | 2VO+1UE | Hochr., Nessler | 4.5 | SS |
| AG | Computational Geometry | 2VO+1UE | Jüttler | 4.5 | SS |
| RISC | Computer Algebra | 2VO+1UE | Winkler | 4.5 | WS |
| | Computer Algebra for Concrete Mathematics | 1UE | Paule | 1.5 | SS |
| | Formal Semantics of Programming Languages | 2VO | Schreiner | 3.0 | SS* |
| | Rewriting in Computer Science and Logic | 2VO | Kutsia | 3.0 | SS |
| SSW | Advanced Compiler Construction | 2KV | Mössenböck | 3.0 | SS* |
| | Modeling and Computer Simulation | 2KV | Prähofer | 3.0 | WS* |
| STAT | Advanced Regression Analysis | 2SE | Waldl | 4.0 | WS |
| | Multivariate Verfahren | 2KV | Waldl | 4.0 | WS |
| | Verallgemeinerte Lineare Modelle | 2KV | Wagner | 4.0 | SS |
| TK | Human/Computer Interaction | 2VO | Kotsis | 3.0 | WS |
| | Mobile Computing | 2KV | Khalil | 3.0 | WS/SS |
| | Web Performance | 2KV | Kotsis | 3.0 | WS |
| TK | Advanced Model Engineering | 2KV | Retschitz., Kaps. | 3.0 | WS |
| CIS | Cooperative Information Systems | 2KV | Retschitz., Kaps. | 3.0 | SS |
| | Modeling Internet Applications | 2KV | Schwinger | 3.0 | SS |

## 4.2 Special Topics

Special Topics allow institutes to take up current trends in their fields and to use the teaching offer of guest lecturers. Courses from this category can be announced without being listed in the curriculum, and there is no obligation to hold them regularly.

The name of special topics courses consists of a main title ("Special Topics:") and a subtitle denoting the actual contents of the course. The type of such courses (VO, UE, KV, PR, SE) as well as their length in hours can be freely chosen by the lecturers. The ECTS points are calculated as hours × 1.5.

## 4.3 Seminars

Seminars are courses in which scientific methods are taught and practiced. Students have to write a seminar thesis about a research-related topic and present it in a seminar talk. The name of a seminar consists of a main title as shown in Table 4 and a subtitle denoting the topic of the seminar.

**Table 4**: *Seminars*

| Seminars | | ECTS | WS/SS |
|---|---|---|---|
| Seminar in Computational Engineering: ... | 2SE | 3.0 | WS/SS |
| Seminar in Data Science: ... | 2SE | 3.0 | WS/SS |
| Seminar in Intelligent Information Systems: ... | 2SE | 3.0 | WS/SS |
| Seminar in Networks and Security: ... | 2SE | 3.0 | WS/SS |
| Seminar in Pervasive Computing: ... | 2SE | 3.0 | WS/SS |
| Seminar in Software Engineering: ... | 2SE | 3.0 | WS/SS |

### 4.4 Gender Studies

Courses from Gender Studies help students to understand gender-specific aspects of computing and technology. Students are strongly expected to select 3 ECTS points from Table 5.

**Table 5**: *Gender Studies*

| Courses | | ECTS | WS/SS |
|---|---|---|---|
| Ethics and Gender Studies | 2VO | 3.0 | WS/SS |
| Gender Studies Managing Equality TN | 2KV | 3.0 | WS/SS |
| Soziale und geschlechterspezifische Aspekte der IT | 2KS | 3.0 | SS |

## 5 Free Electives

Students have to take free elective courses with a total of 8 hours (12 ECTS). These courses can be selected from any degree program at any university and can be taken throughout the whole Master's program. Their goal is to provide students with additional skills beyond the area of Computer Science. Courses in social skills, foreign languages, and gender studies are particularly recommended, but it is also possible to select more Computer Science courses here.

## 6 Master's thesis and Master's thesis seminars

As a final project students have to write a Master's thesis. The Master's thesis can be written at any Computer Science institute, but its topic should be chosen from the selected Major Subject. The goal of the Master's thesis is to demonstrate that students are able to solve a non-trivial problem in their area of specialization using scientific methods and latest technology.

As a preparation and a guidance for the Master's thesis, students have to take the two master seminars from Table 6.

**Table 6**: *Master's thesis seminars*

| Courses | | ECTS | WS/SS |
|---|---|---|---|
| Master's Thesis Seminar WS | 3SE | 8.0 | WS |
| Master's Thesis Seminar SS | 3SE | 8.0 | SS |

## 7 Examinations

The degree program is completed if all examinations for the courses described in Sections 3 to 6, as well as the Master's examination have been passed and the Master's thesis has been accepted.

**Course examinations**. The examination mode (written or oral) for lectures (VO) and for combined courses (KV) can be defined by the lecturer. Labs (UE) and practicals (PR) are assessed by continuous and final evaluations. Seminars (SE) are assessed on the basis of the seminar paper, the seminar presentation and the cooperation of the student in the seminar.

**Master's examination**. The Master's examination is the final examination of the degree program. It is assessed by a committee of three professors and consists of the following three parts:

- *Master's thesis defence* (20 minutes), assessed by the head of the examination committee.
- *Examination about the Major Subject* (20 minutes), assessed by an examiner representing the Major Subject.
- *Examination about one or several courses of the Complementary Subject* (20 minutes), assessed by an examiner representing these courses.

The effort of the Master's examination is calculated with 2.5 ECTS points.

# 8 Recommended course of study

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<tr><th>1. Sem</th><th></th><th>2. Sem</th><th></th><th>3. Sem</th><th></th><th>4. Sem</th><th></th></tr>
<tr><td rowspan="2">Major Subject</td><td rowspan="2">13.5</td><td rowspan="2">Major Subject</td><td rowspan="2">13.5</td><td>Master's Thesis</td><td>8.5</td><td rowspan="2">Master's Thesis</td><td rowspan="2">16.5</td></tr>
<tr><td rowspan="2">Major Subject (Seminar andProject)</td><td rowspan="2">10.5</td></tr>
<tr><td rowspan="2">Complementary Subject</td><td rowspan="2">13.5</td><td rowspan="2">Complementary Subject</td><td rowspan="2">13.5</td><td rowspan="2">Master's Thesis Seminar</td><td rowspan="2">8</td><td>Master's Examination</td><td>2.5</td></tr>
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