Structure of the studies 2018-2020

The Master’s Programme in Information Technology has a duration of two academic years and accounts for 120 ECTS. This means that the student should complete about 60 ECTS each academic year. The structure of programme is composed of two Compulsory Modules, a thematic module and a Master thesis and seminar module. In addition, students can take four elective courses of choice from any subject at Åbo Akademi University.
Compulsory Modules (2x20 ECTS)

Compulsory Modules for the Computer Science specialization

Logic and Algorithms (choose 20 ECTS)

- Specification Methods (5 ECTS)
- Computability and computational complexity (5 ECTS)
- Databases (5 ECTS)
- Graph algorithms (5 ECTS)
- Advanced Text algorithms (5 ECTS)
- Cryptography and Network Security (5 ECTS)

Project and Practice (20 ECTS)

- Project Course* (10 ECTS)
- Lab Internship (10 ECTS)

Compulsory Modules (2x20 ECTS)

Compulsory Modules for the Computer Engineering specialization

Software Technology I (choose 20 ECTS)

- Development of Web Services (5 ECTS)
- Development of Interactive Web Applications (5 ECTS)
- Parallel Programming (5 ECTS)
- Code Optimization (5 ECTS)
- Cloud Computing (5 ECTS)
- GPU programming (5 ECTS)

Software Technology II (choose 20 ECTS)

Compulsory course:

- Project Course* (10 ECTS)

Choose two of the following courses:

- Software Architecture (5 ECTS)
- Software Testing (5 ECTS)
- Software Quality (5 ECTS)
- Advanced Course of Software Engineering (5 ECTS) Offered by the University of Turku
- Participation in software and computer engineering hackatons and open projects (max 5 ECTS)

* In the Project Course, students will develop an IT project in teams over three periods in close contact with external customers from industry. The resulting projects are demonstrated in a popular student event, the ICT Showroom, which is a joint ICT student project competition among the universities in Turku. Many of the projects completed earlier in the course have been done in collaboration with local industry, and some have resulted in new start-up companies.
Thesis and Seminar (40 ECTS)

The goal of the Master's thesis is to demonstrate the student's capability to perform independent work. This work can be in the form of the design and evaluation of a complex system using sound computational and engineering methods; it can also consist of a research problem and its solution; it can be a survey of topics emphasising some novel, previously overlooked aspects; etc. The Master's Thesis can be undertaken when the you have enough knowledge in the field. The Master's Thesis work is typically performed in a company or in a university laboratory. Via the Turku Centre for Computer Science, students can enrol in the TUCS internship programme. The internship is integrated with the IT Master programme and it leads to the students' Master thesis project. The master thesis are often carried out in collaboration with the local or national software industry.

The module is composed of:
- Master's thesis (30 ECTS)
- Experimentation in Computer Science and Engineering (5 ECTS)
- Master's thesis Seminar (5 ECTS)

Thematic Modules (20 ECTS)

The programme gives the students the opportunity to specialize in different domains by selecting one of the following thematic modules:

Bioinformatics
Choose 20 ECTS from the following courses:
- Computational Modelling: Methods and Applications (5 ECTS) alt. with
- Introduction to Computational and Systems Biology (5 ECTS) alt. with
- Introduction to Genomics (5 ECTS) Offered by the University of Turku
- Bioinformatics, Programming Course (5 ECTS) Offered by the University of Turku
- Biological Data Analysis with R (5 ECTS) Offered by the University of Turku
- Computer-aided Drug Design (5 ECTS) Course in biochemistry
- Structural Biology (5 ECTS) Course in biochemistry

Computational Data Analytics
Choose 20 ECTS from the following courses:
- Introduction to Data Science (5 ECTS) Online course
- Data Analysis with Visual Basic (5 ECTS) Online course
- Data Analytics Software (5 ECTS)
- Computational Modelling: Methods and Applications (5 ECTS)
- Machine Learning (5 ECTS) Online course
- Machine Learning and Algorithmics Seminar (5 ECTS) Offered by the University of Turku
- Machine Learning and Pattern Recognition (5 ECTS) Offered by the University of Turku

Industrial Internet
Choose 20 ECTS from the following courses:
- System architecture of Internet of Things 5cr
- Analytics for Industrial Internet (5 ECTS)
- Wireless Digital Communication (5 ECTS)
- Parallel programming (5 ECTS) or Code optimization (5 ECTS) (offered alternating years)
- Multidimensional Sensing Techniques (5 ECTS)
- Distributed Systems and Algorithms (5 ECTS)
Safety-critical and Autonomous Systems

Choose 20 ECTS from the following courses:

- Multidimensional sensing techniques (5 ECTS)
- Real-time systems (5 ECTS)
- Software Safety (5 ECTS)
- Control of Discrete Event Systems (5 ECTS)
- Specification Methods (5 ECTS)
- Reliable Distributed Systems (5 ECTS)
- Distributed Systems and Algorithms (5 ECTS)
- Autonomic Software and Systems (5 ECTS)
- Security Engineering (5 ECTS) Offered by the University of Turku

Note: The compulsory modules Software Technology 1, Software Technology 2 and Logic and Algorithms may also be taken as thematic modules if they are not included in your specialization. However, the same course cannot be included in different modules.

Elective Study Module (20 ECTS)

Choose 20 study credits from the courses offered by Åbo Akademi University and Turku Centre for Computer Science.

The elective studies may also include an additional thematic of compulsory module.