Master's Degree Programme in
Embedded Computing

The goal of the programme is to impart education on embedded system design and modelling. The field is vast covering both hardware and software aspects. A student will obtain a firm foundation to design, model and implement embedded systems. To master the development process, a student will have an understanding of design constraints, hardware/software trade-offs, design methods and software and hardware architectures as well as low-level programming of embedded systems. The programme will be designed and implemented in co-operation with the corresponding programme at Åbo Akademi University.

The programme leads to a Master of Science degree in Technology (diplomi-insinööri (DI) in Finnish). It is a two-year programme designed to give a good understanding of theoretical issues for starting PhD studies in the field of embedded computing as well as practical competences for challenging design tasks in the Embedded Systems Industry. Courses are jointly managed by the University of Turku and Åbo Akademi University, and take advantage of modern educational technology. Education is given in English, and the students of this international programme learn to work together with associates from different countries and scientific backgrounds.

The aim of the Master's Degree Programme in Embedded Computing is to offer:

- multidisciplinary education, which addresses systematic design of embedded systems from both hardware and software perspective.
- profound knowledge in the field of embedded computing.
- ability to model, design and verify advanced embedded solutions.
- understanding of the factors that influence hardware/software tradeoffs.
- ability to carry out research in the field, analyse research results and perform innovative design tasks.
- competence for postgraduate studies in the field of embedded computing.

Admission requirements

Academic requirements
A completed university level Bachelor's degree in Computer Science or Computer Engineering is required for admission.

Language requirements
Applicants to the Master's degree programmes taught in English must always prove their knowledge of the English language.

Application period
The application period for studies starting in September runs from the beginning of December until late February.

For details, please see the admission pages at
http://embeddedcomputing.utu.fi/

University of Turku is an internationally acknowledged, multidisciplinary scientific university located on the Southwest coast of Finland, in the vivid city of Turku.

With 21,000 students and 3,000 employees, it is one of the major universities in Finland. Expertise within the University and its seven faculties ranges from humanities to natural sciences.

This programme is offered by the Department of Information Technology at the University of Turku.

Degree awarded
Master of Science in Technology

Duration
2 years (120 ECTS)

Language of instruction
English

Location
University of Turku - Turku, Finland
www.utu.fi

Programme start
late August/September

Course overview

Master of Science in Technology (120 ECTS)

A. Advanced-level studies in the major subject 65-70 ECTS
    a. Compulsory courses as listed in modules EC1 and EC2
    b. Compulsory as well as optional courses as listed in module EC3
or
    An Embedded Computing related Core Competence -module CC offered by one of the partner universities in NMS iICT

B. Optional and language studies 20-25 ECTS
    a. Studies in the minor subject (20 ECTS)
        Courses listed in module IE offered by the Innovation and Entrepreneurship offered by Turku School of Economics
    b. Optional studies (20 ECTS) module EC4
    c. Language studies (0-5 ECTS)

C. Master's thesis 30 ECTS
    The Master's thesis represents the practical and theoretical parts of a research task.

EC1 (20 ECTS)
System Modelling with SystemC
HDL Based Design
Real-Time Systems
Programming of Embedded Systems

EC2 (20 ECTS)
SoC Design
FPGA Prototyping
Modelling of Embedded Systems
Design Methods for Embedded Systems

Mutually exclusive modules EC3 and CC are:

EC3 (25-30 ECTS)
Compulsory courses (15 ECTS)
Multiprocessor Architectures
System Verification
Formal System Modelling and Verification

Optional courses (10-15 ECTS) in subjects related to Embedded Computing, e.g.
Reconfigurable Computing
Advanced Networking for Embedded Systems
Applied Signal Processing, theory
Code Optimization

All courses are 5 ECTS.
Please note that the course list is subject to change.

CC (30 sp)
The student can choose one Embedded Computing related Core Competence – module according to her/his personal study plan.

EC4 (20 ECTS)
Optional courses in subjects related to Embedded computing.

IE (20 ECTS)

Innovation and Entrepreneurship -module is based on long experience on entrepreneurship and innovation research-based teaching and development activities of the Turku School of Economics (TSE). The main idea behind Innovation and Entrepreneurship -module is to give the student a comprehensive picture of current innovation and entrepreneurship issues. Additionally, ICT and related industries.

Courses
Innovation and entrepreneurship in ICT context
New business models
Business competence and innovations
Innovations and global growth

Master's thesis

At the end of the studies, students will do their master's theses. The subject of the master's thesis will be connected to the research and development projects carried out at the university or in industry.

Career prospects

The students graduating from the programme will have a multidisciplinary education, which addresses systematic design of embedded-systems from both hardware and software perspective. The profound knowledge in the field of embedded computing together with innovation and entrepreneurship studies offers the ability to work in the embedded systems industry from start-up to large-scale enterprises. After graduating research oriented students may pursue for a doctoral degree to extend their knowledge and increase their job prospects in academia, industry and public sector.

Availability of latest technologies

1.   Iceland
2.   Sweden
3.   Finland
4.   Denmark
5.   Finland
6.   United States
7.   Norway
8.   Switzerland

Source: The Global Information Technology Report 2008-2009

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