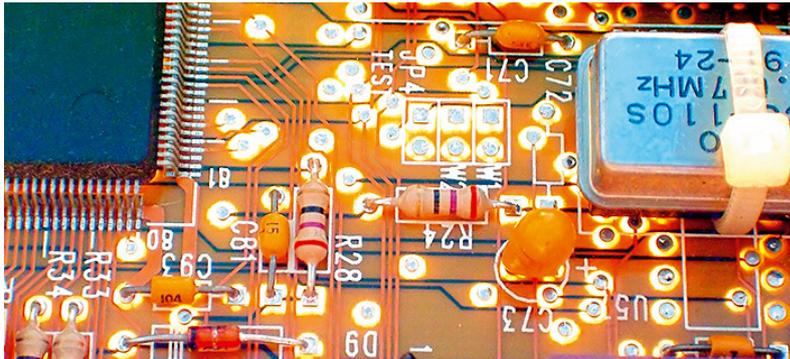# Master Programme in Embedded Systems 2017/2018

120 CREDITS

UPPSALA

CAMPUS 100%

The Master Programme in Embedded Systems provides students with a world-class education in computer and systems engineering with a focus on design, implementation, and analysis of embedded systems. The programme is closely connected to cutting-edge research at Uppsala University, and as a student you will gain skills and knowledge that are highly relevant on the national and international labour market, both in industry and academia.

Many devices applied routinely in our daily life, for instance cell phones, washing machines, cars, or even airplanes are controlled by embedded computers. Devices may contain hundreds of microprocessors and millions of lines of program code, all of which are essential for correct functioning of a system. Embedded computer systems are a decisive factor for industries and societies. The development of embedded systems requires sophisticated technical skills within disciplines such as computer science, electronics, and mathematics.

Uppsala University is a leading research institute in embedded systems. The programme is developed and conducted as a close collaboration between major research centres, which among others study multi-core computers and parallel systems (within UPMARC), wireless sensor networks, and the Internet of Things.

ABOUT THE PROGRAMME

A Master's degree in Embedded Systems at Uppsala University provides candidates with a world class education in computer science and systems engineering, with a focus on the design, implementation, and analysis of embedded systems. The programme covers both theoretical and practical aspects of embedded systems, and conveys skills and knowledge that are highly relevant to the national and international labour market. Courses offered include both traditional and project-oriented training, covering a wide range of topics relevant for embedded systems as well as industry and workplace-related skills. The programme also provides considerable flexibility and opportunity to create a personal profile through choice of elective subjects from other areas of the university.

An important goal of the programme is the ability to write embedded software in a range of development environments and programming paradigms. You will be able to quickly utilise new languages and programming environments. The degree also focuses on problem analysis, formulation of design requirements and implementation of systems using the latest technology. You will also be able to summarise existing knowledge and recent research results in the area.

The programme includes a wide range of courses which can be selected based on personal interest or prior studies. Elective subjects can be chosen from all areas of the university as part of an individual profile. Examples of courses include:

- Construction and Programming of Embedded Systems
- Automated Control
- Networking
- Distributed Systems
- Applied Mathematics
- Modelling and Verification of Computer Systems and Software
- Real-time Systems and Signal Processing
- Digital Electronics Design.

There are also many opportunities to participate in research projects conducted at Uppsala University. Many of the courses are taught by internationally renowned researchers.

DEGREE

The programme leads to a Master of Science (120 credits) with Embedded Systems as the main field of study.

INSTRUCTION

The degree combines traditional courses with lectures and laboratory work as well as project-based courses. The coursework focuses on developing skills and knowledge relevant for a professional career as engineer or researcher. The programme takes place in Uppsala.

The programme is taught in English.

CONTENT

Each semester is divided into two periods. Depending on the courses chosen, the study load varies between one and six courses per semester.

A typical study pattern is to take courses running over one period or over a whole semester within the first and second semester.

The third semester is devoted to a major project within electronics construction or automatic control, together with two half-term courses.

The final semester in the programme is devoted to a full-time thesis project.

COURSES WITHIN THE PROGRAMME

Here is an overview of recommended courses in the programme. There are various alternative courses that can be chosen based on personal preference and previous studies. See outline for complete list of courses.

Semester 1
Introduction to Studies in Embedded Systems, 5 credits
Real Time Systems, 10 credits
Micro-controller Programming, 10 credits
Introduction to Computer Control Systems, 5 credits

Semester 2
Programming Embedded Systems, 10 credits
Wireless Communication and Networked Embedded Systems, 10 credits
Accelerating Systems with Programmable Logic Components, 10 credits

Semester 3
Model-based Design of Embedded Software, 10 credits
Automatic Control II, 5 credits
Embedded Control Systems, Project,15 credits
Project in Digital Electronic Constructions, 15 credits

Semester 4
Degree project, 30 credit

CAREER

Embedded systems are a major global market, controlling a broad range of everyday and specialised devices.

The programme is central to today's and tomorrow's labour market, both in Sweden and internationally. With a Master's degree in Embedded Systems from Uppsala University you are well prepared for a career in industry or research.

People with a strong computer science education, combined with knowledge of, and skills in, design and development of embedded systems are in great demand on the labour market.

Embedded systems are a vital element of modern motor vehicles. Skills in embedded systems development are in demand with employers such as General Motors, Volvo, BMW, Mercedes, Toyota, Mazda, Scania and others.

There are also applications in aeronautics and robotics, with employers such as ABB, or in communications, with companies including Ericsson or Huawei, just to name a few major areas.

APPLICATION AND REQUIREMENTS

MASTER PROGRAMME IN EMBEDDED SYSTEMS

120 credits

Autumn 2017 100% Campus

Location: Uppsala

Application Deadline: 2016-01-15

Enrolment Code: UU-M1323

Language of Instruction: English

Requirements:

Academic requirements
A Bachelor's degree, equivalent to a Swedish Kandidatexamen, from an internationally recognised university. The main field of study must be engineering, mathematics or computer science. Also required is:

- 30 credits in mathematics; and
- 30 credits in computer science, including courses in programming, computer architecture and operating systems.

Language requirements
All applicants need to verify English language proficiency. This is normally attested by an internationally recognised test such as TOEFL or IELTS with the following minimum scores:

- IELTS: an overall mark of 6.5 and no section below 5.5
- TOEFL: Paper-based: Score of 4.5 (scale 1–6) in written test and a total score of 575. Internet-based: Score of 20 (scale 0–30) in written test and a total score of 90
- Cambridge: CAE, CPE

Exemptions for students from certain countries.

Selection: Students are selected based on:

- a total appraisal of quantity and quality of previous university studies; and
- a statement of purpose (1 page).

Fees: If you are not a citizen of a European Union (EU) or European Economic Area (EEA) country, or Switzerland, you are required to pay application and tuition fees. Read more about fees.

Application Fee: SEK 900

Tuition fee, first semester: SEK 72500

CONTACT & MORE INFO

Department of Information Technology

ITC, hus 1,2,4 Lägerhyddsv. 2

Box 337, 751 05 UPPSALA

Fax: 018-511925

E-mail: info@it.uu.se

For programme-specific information, please contact: Philipp Rümmer philipp.ruemmer@it.uu.se

Telephone: +46 18 471 31 56

For general information about Master's studies at Uppsala University, please send an email to: masterprogrammes@uu.se