LUND UNIVERSITY | LTH FACULTY OF ENGINEERING

Programme Syllabus

Master's Programme in Embedded Electronics Engineering

- Faculty: Faculty of Engineering, LTH
- Programme code: TAEEE
- Credits: 120
- Admission level: Bachelor's degree
- Degree level: Second cycle
- Approved by: Programme Board E
- Approval date: 3 February 2026
- Validity: Academic year 2026/2027
- Entry into force: 3 February 2026

1 Aim and outcomes

1.1 Aim

This internationally oriented Master's programme aims to develop the students' knowledge, skills and judgement in the area of embedded electronics engineering. It is motivated by the dramatic changes taking place in the Integrated Electronics Systems and Integrated Circuits (IC) fields.

In circuit design an engineer implements function, either whole systems or functions that in turn build up more complex systems. Functions that are implemented are e.g., processor cores, transceivers, data converters, sensors, accelerators or other electronic components. System on chip integrates several function blocks and thus reaches high complexity. System on chip is used in a diverse field of applications such as; e-Health, telecommunication, automotive industry etc.

Embedded systems often use one or more system on chip that can be programmed to achieve a high abstraction level.

For a number of years, research at Lund University has focused on this problem. Experience gained from this research has been incorporated in the Master's programme.

1.2 Outcomes for a Degree of Master of Science (120 credits)

(Higher Education Ordinance 1993:100)

Knowledge and understanding

For a Degree of Master of Science (120 credits) the student shall

- demonstrate knowledge and understanding in the main field of study, including both broad knowledge of the field and a considerable degree of specialised knowledge in certain areas of the field as well as insight into current research and development work, and
- demonstrate specialised methodological knowledge in the main field of study.

Competence and skills

For a Degree of Master of Science (120 credits) the student shall

- demonstrate the ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomena, issues and situations even with limited information,
- demonstrate the ability to identify and formulate issues critically, autonomously and creatively as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames and so contribute to the formation of knowledge as well as the ability to evaluate this work,
- demonstrate the ability in speech and writing both nationally and internationally to report clearly and discuss his or her conclusions and the knowledge and arguments on which they are based in dialogue with different audiences, and

- demonstrate the skills required for participation in research and development work or autonomous employment in some other qualified capacity.

Judgement and approach

For a Degree of Master of Science (120 credits) the student shall

- demonstrate the ability to make assessments in the main field of study informed by relevant disciplinary, social and ethical issues and also to demonstrate awareness of ethical aspects of research and development work,
- demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used, and
- demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

1.3 Specific outcomes for a Degree of Master of Science (120 credits) in Electronic Design

Knowledge and understanding

For a Degree of Master of Science (120 credits) students shall

- demonstrate specialised knowledge of the foundations in electronics and computer science to the sub-fields relevant to the field of embedded electronics engineering/system on chip,
- be able to analyse the components from different domains of embedded electronics engineering/system on chip,
- understand how different domains interact, such as hardware versus software and analogue versus digital construction, and
- demonstrate knowledge of intellectual property rights in general and of the field of embedded electronics engineering/system on chip in particular.

Competence and skills

For a Degree of Master of Science (120 credits) students shall

- demonstrate the ability to identify, formulate and deal with complex issues in the field of embedded electronics engineering/system on chip critically, autonomously and creatively and with a holistic approach,
- analyse and critically evaluate different technical solutions,
- demonstrate the ability to participate in research and development projects,
- demonstrate the ability to critically and systematically acquire new knowledge in the field of electronics and integrate this with previous knowledge,
- demonstrate the ability to design, simulate and evaluate systems or parts embedded electronics engineering/system on chip,
- demonstrate the ability to autonomously plan and complete advanced tasks,
- demonstrate the ability to develop and design electronic systems and their constituents while taking into account the circumstances and needs of individuals and the targets for sustainable development set by the community, and
- demonstrate the ability to report in speech and writing their knowledge and different types of project work, including background material, investigation and findings, to expert and non-expert audiences in international contexts.

Judgement and approach

For a Degree of Master of Science (120 credits) students shall

- demonstrate the ability to make assessments informed by relevant disciplinary, social and ethical aspects,
- demonstrate the capacity for teamwork and collaboration with various constellations, and
- demonstrate the ability to identify their need for further knowledge in the field and to continuously upgrade and broaden their knowledge.

2 Programme structure

The programme includes a compulsory block of courses intended to provide an orientation in modern chip design. The aim is to provide a general overview of embedded electronics engineering and a foundation for an understanding of all types of IC design, i.e. in digital, mixed signal and analogue design, and also basic knowledge of built-in systems. Students may be allowed to attend PhD courses that fit into the master's programme.

2.1 Courses

The courses included in the programme are indicated in the timetable. Students may also be allowed to attend PhD courses that fit into the master's programme. Students are entitled to accreditation of 7.5 credits of courses in Swedish (organised by Lund University for exchange students).

2.2 Further studies

On completion of the second-cycle degree, students have basic eligibility for third-cycle studies.

3 Admission requirements

A Bachelor's degree in electrical engineering, computer science or equivalent. Completed courses in mathematics (calculus, differential equations, transform theory and linear algebra) of at least 30 credits/ECTS, as well as completed courses in basic circuit theory, electronics, analogue electronics and digital electronics corresponding at least 30 credits/ECTS in total. The applicant must have basic programming skills (at least on course) and knowledge of electronic description languages, such as VHDL/Verilog. English 6.

4 Degree

4.1 Degree requirements

For a Degree of Master of Science (120 credits) students must successfully complete courses comprising 120 credits, including a

degree project worth 30 credits. At least 90 credits must be second-cycle credits and at least 60 credits of those must be in the main field of study, including the degree project.

4.2 Degree and degree certificate

When students have completed all the degree requirements, they are entitled to apply for a certificate for a Degree of Master of Science (120 credits), Main Field of Study: Electronic Design.