

Embedded Systems Design

Konstruktion av inbyggda system
4 credits

Programme course

TDDI08

Valid from: 2025 Spring semester

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|--|----------------------------------|-----------------------------------|
| Determined by | Main field of study | |
| Board of Studies for Computer Science and Media Technology | Computer Science and Engineering | |
| Date determined | Course level | Progressive specialisation |
| 2024-08-28 | First cycle | G2F |
| Revised by | Disciplinary domain | |
| | Technology | |
| Revision date | Subject group | |
| | Computer Technology | |
| Offered first time | Offered for the last time | |
| Spring semester 2007 | | |
| Department | Replaced by | |
| Institutionen för datavetenskap | | |

Course offered for

- Bachelor of Science in Engineering Electronics
- Bachelor of Science in Computer Engineering

Prerequisites

Basic courses in computer architectures, programming.

Intended learning outcomes

The aim of the course is to address the particular problems concerning the design of complex embedded systems. Modern design methodologies are presented with an emphasis on early design phases, such as modeling, verification and system-level synthesis, not covered by traditional methods.

After completing the course, the students should be able to:

- Apply modern system-level methods and tools for the design of real-time embedded systems.
- Use modern modeling, verification and simulation tools in the context of system-level design.
- Analyze the particular features of the application and select the most appropriate modeling approach.
- Evaluate the implications of system level design decisions, regarding system architecture, task scheduling and mapping, on the final system performance, cost, and power consumption.
- Describe the complex interactions between hardware architecture and software implementation.
- Perform design space exploration using a system-level simulation environment.

Course content

Embedded systems and their design, Design flow, Specification and modeling of embedded systems, Simulation and estimation, Architectures for embedded systems, Mapping and scheduling.

Teaching and working methods

The course consists of a series of lectures, lesson and laboratory exercise.

Examination

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|------|---------------------|-------------|------------|
| DIT1 | Digital examination | 2.5 credits | U, 3, 4, 5 |
| LAB2 | Laboratory work | 1.5 credits | U, G |

Grades for examination modules are decided in accordance with the assessment criteria presented at the start of the course.

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is “Swedish”, the course as a whole could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- If teaching language is “Swedish/English”, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.

Other

The course is conducted in such a way that there are equal opportunities with regard to sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation and age.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

The course is campus-based at the location specified for the course, unless otherwise stated under “Teaching and working methods”. Please note, in a campus-based course occasional remote sessions could be included.