Embedded Systems Design

Programme course

4 credits

Konstruktion av inbyggda system

TDDI08

Valid from: 2020 Spring semester

Determined by
Board of Studies for Computer Science
and Media Technology

Date determined
2019-09-23

Main field of study
Computer Science and Engineering

Course level
First cycle

Advancement level
G2F

Course offered for
- Computer Engineering, B Sc in Engineering
- Engineering Electronics, B Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Basic courses in digital design, 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

LAB1	Laboratory work	1.5 credits	U, G
TEN1	Written exam	2.5 credits	U, 3, 4, 5

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 or in large parts, is taught in Swedish. Please note that although teaching language is Swedish, parts of the course could be given in English. Examination language is Swedish.
- 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).
- If teaching language is English, the course as a whole is taught in English. Examination language is English.

Other

The course is conducted in a manner where both men's and women's experience and knowledge are made visible and developed.

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.

Department

Institutionen för datavetenskap

Director of Studies or equivalent
Ola Leifler

Examiner
Petru Eles

Course website and other links
http://www.ida.liu.se/~TDDI08

Education components
Preliminary scheduled hours: 42 h
Recommended self-study hours: 65 h

Course literature
Peter Marwedel: "Embedded System Design", Springer, 2nd edition, 2011