Embedded Systems Design

Programme course

4 credits

Konstruktion av inbyggda system

TDDI08

Valid from:

Determined by

Date determined

Main field of study

Computer Science and Engineering

Course level

First cycle

Advancement level

G2F

Course offered for

- Computer Engineering, 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

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Department

Institutionen för datavetenskap

Director of Studies or equivalent

Ahmed Rezine

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