HE1024 Real Time Systems 7.5 credits

Realtidssystem

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for HE1024 valid from Autumn 2007

Grading scale

A, B, C, D, E, FX, F

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Good knowledge of C programming and computer architecture (e.g. the courses HI1900 Computer Programming, Basic Course and HE1005 Computer Engineering

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The aim of the course is to provide good knowledge about real time system theories and an overview of different design methods with focus on reliability and safety in real time systems. The course will also give the student practice in developing and debugging real time applications using a modern development environment.

After passing the course, the student should be able to:

- develop and debug real time applications using a modern development environment
- use a real time kernel to create real time applications
- explain different process synchronization methods
- explain different scheduling algorithms
- explain the CAN bus and distributed real time systems in general
- use a modern code generating UML-tool.

Course contents

- hardware and compiler requirements: computer architecture, software design
- real time kernels: timer interrupt, pre-emptive and non-pre-emptive kernels
- processes: process communication, synchronisation, mutual exclusion , locking
- scheduling
- reliability
- optimization
- development environment: emulators, debuggers, simulators, UML state charts

Course literature

Johansson, Roger m fl: Realtidssystem för högskolans Ingenjörsutbildningar, ISBN 91-89280-14-8

Examination

- LAB1 - Laboratory Work, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- RED1 - Account, 3.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Other requirements for final grade

Theoretical exam /RED1; 3 cr.), grading A-F
Practical exercises (LAB1; 4.5 cr.), grading A-F
The final grade is based on the two parts. Grading A-F.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.