



# HE1024 Real Time Systems 7.5 credits

Realtidssystem

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

## Establishment

Course syllabus for HE1024 valid from Spring 2014

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

## 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:

- use modern real-time development environments
- 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

## 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 and scheduling
- Porting to a real-time system
- reliability: fault tolerance and safety
- derivation of WCET(worst case execution time)
- design of realtime applications

## Disposition

Lectures

Laboratory Work

## Course literature

Kurskompendium: Robusta realtidssystem, delas ut under första kurstillfället.

## Examination

- TEN1 - Written Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- LABA - Laboratory Work, 4.5 credits, grading scale: P, 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.

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

## Other requirements for final grade

Written examination

Approved laboratory exercises

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.