



COURSE SYLLABUS

Operating Systems for Embedded Systems, 9 credits

Operativsystem för inbyggnad, 9 högskolepoäng

Course Code: TOIK14	Education Cycle: First-cycle level
Confirmed by: Dean Aug 1, 2014	Disciplinary domain: Technology (95%) and social sciences (5%)
Revised by: Director of Education Jan 27, 2016	Subject group: DT1
Valid From: Aug 1, 2016	Specialised in: G1F
Version: 2	Main field of study: Computer Engineering
Reg number: 2016/417-313	

Intended Learning Outcomes (ILO)

After a successful course, the student shall

Knowledge and understanding

- display knowledge of and be able to explain how operating systems structured and works, especially when it comes to interrupts, processes, threads, and scheduling
- show familiarity with the characteristics of different types of real-time systems.
- display knowledge of the interaction between the hardware and operating system
- show familiarity with and be able to describe some common operating systems for embedded Systems
- demonstrate comprehension of the interaction between the hardware and operating system
- demonstrate comprehension of how the interrupt, jitter and operating, etc. affect a real-time, and how these impacts can be minimized
- demonstrate comprehension of how Linux-like operating systems are structured in terms of architecture, configuration management, process management, file system, etc.

Skills and abilities

- demonstrate the ability to use an operating system in the development of an embedded system
- demonstrate skills of using programming interface in the operating system for the creation of periodic tasks, communication between tasks and task synchronization
- demonstrate the ability to avoid the various problems that can arise in inter-process communication

Judgement and approach

- demonstrate the ability to use different methods to determine if scheduling is possible

Contents

The course covers the theories behind, and use of, operating systems for real-time applications and embedded systems.

The course covers the following topics:

- Introduction to Real-Time Systems
- Structure of operating systems, including real-time properties
- Concurrent Programming
- Scheduling of real-time tasks
- The use of operating systems

Type of instruction

Lectures and laboratory work.

The teaching is normally conducted in Swedish, but can occasionally be in English.

Prerequisites

General entry requirements and completed course Microcontrollers, 6 credits and Introduction to Programming, 9 credits (or the equivalent).

Examination and grades

The course is graded 5,4,3 or Fail.

Registration of examination:

Name of the Test	Value	Grading
Examination ¹	4 credits	5/4/3/U
Laboratory work	5 credits	U/G

¹ Determines the final grade of the course, which is issued only when all course units have been passed.

Course literature

Literature

The literature list for the course will be provided one month before the course starts.