



## COURSE SYLLABUS

# Operating Systems for Embedded Systems, 9 credits

*Operativsystem för inbyggnad, 9 högskolepoäng*

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

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### 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 <sup>1</sup>	4 credits	5/4/3/U
Laboratory work	5 credits	U/G

<sup>1</sup> 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.