



## COURSE SYLLABUS

# Operating Systems, 7.5 credits

*Operativsystem, 7,5 högskolepoäng*

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<b>Course Code:</b> TOSK18	<b>Education Cycle:</b> First-cycle level
<b>Confirmed by:</b> Dean Jun 1, 2019	<b>Disciplinary domain:</b> Technology
<b>Revised by:</b> Director of Education Feb 21, 2024	<b>Subject group:</b> DT1
<b>Valid From:</b> Aug 1, 2024	<b>Specialised in:</b> GIF
<b>Version:</b> 3	<b>Main field of study:</b> Computer Engineering

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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 system are constructed and works, especially when it comes to interrupts, processes, threads, and scheduling
- Display knowledge of what characterizes different kinds of real-time systems
- Display knowledge of and be able to explain the interaction between hardware and an operating system
- Display knowledge of and be able to describe some operating systems for embedded systems
- Display knowledge of how interrupts, jitter, and drift etc. affects a real-time system and how they can be minimized
- Display knowledge of how Linux operating systems are built especially regarding architecture, configuration, process handling, and file systems etc.

Skills and abilities

- Demonstrate skills in using programming interfaces in operating systems for creating threads / processes and establishing communication and synchronization between periodic threads / process
- Demonstrate the ability to use an operating system when developing an embedded system.

Judgement and approach

- Demonstrate the ability to use different methods to decide if a scheduling is feasible

### Contents

To give basic knowledge of operating systems for real-time and embedded systems and how these can be configured and used by their programming interfaces.

The course covers the following topics:

- Introduction to real-time systems
- Structure of operating systems, especially those with real-time capabilities

- Concurrent programming
- Scheduling of real-time tasks
- Use of operating systems

### **Type of instruction**

Teaching consists of lectures and laboratory exercises.

The teaching is conducted in English.

### **Prerequisites**

### **Examination and grades**

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

The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

Name of the Test	Value	Grading
Written examination <sup>†</sup>	4 credits	5/4/3/U
Laboratory Work	3.5 credits	U/G

<sup>†</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.

Title: Modern Operating Systems

Author: Andrew S. Tanenbaum, Herbert Bos

ISBN: 9781292061429

Title: Hard Real-Time Computing Systems

Author: Giorgio C. Buttazzo

ISBN: 9781461406754