

*Course syllabus*

# Datorarkitekturer med operativsystem Computer Architectures and Operating Systems

**EITF60, 7,5 credits, G2 (First Cycle)**

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED C/D

**Date of Decision:** 2023-04-18

## General Information

**Compulsory for:** IDA2

**Language of instruction:** The course will be given in Swedish

## Aim

- Have an overview of basic principals of construction in a computer system and be familiar with the foundations of the operating system.

## Learning outcomes

*Knowledge and understanding*

For a passing grade the student must

- be able to explain the concepts of pipelining, cache memory, virtual memory and operating systems
- be able to describe how these concepts collaborate in a modern computer architecture
- be able to compare the performance of different architectures considering the instruction set, pipelining and memory organisation.

*Competences and skills*

For a passing grade the student must

- evaluate different architectures and estimate their usage

- make overview of important characteristics of a computer architecture and an operating system.

## Contents

The different components of a computer system and their interaction will be described. A computer systems performance depends upon different factors such as the programs, instruction set and architecture. The course will cover, among other things, memory management, different types of buses and parallel processors. Pipelining and cache memory technique are two fundamental principles which will be studied. The course will also touch upon examples of embedded systems and highlight the operating systems role in an efficient, fully functioning computer system.

In the operating system part of the course, the following subjects will be discussed:

- The design of operating systems.
- Different types of operating systems.
- Processes.
- Memory management.
- File handling.

## Examination details

**Grading scale:** TH - (U,3,4,5) - (Fail, Three, Four, Five)

**Assessment:** Examination is performed using laboratory exercises, presentation of report/assignment, tests and a written exam. To receive a pass, that is grade 3, it is required to pass laboratory exercises, do all listed parts related to the report/assignment, as well as the tests (which are executed during the course). For higher grades, that is 4 and 5, requires the written exam (at the end of the course). The written exam is not mandatory. To be eligible to take the written exam, it is required to have passed the tests, the presentation of the report, and the laboratory exercises.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

### Parts

**Code:** 0119. **Name:** Examination.

**Credits:** 4. **Grading scale:** TH. **Assessment:** Passing online tests during the course will give grade 3. For higher grades, it is required to pass the online tests during the course and complete a written exam with a grade of 4 or 5.

**Code:** 0219. **Name:** Laboratory Work.

**Credits:** 2. **Grading scale:** UG. **Assessment:** Verbal examination while the laboratory is performed.

**Further information:** All laboratory exercises are to be completed while the course is active and all laboratory exercises are to be completed within the same academic year.

**Code:** 0319. **Name:** Report.

**Credits:** 1,5. **Grading scale:** UG. **Assessment:** Written report. **Further information:** All parts required for the report section must be completed while the course is active and all parts must be performed in the same academic year.

## Admission

### Admission requirements:

- EDI610 Digital Systems or EITA15 Digital Systems

**The number of participants is limited to:** No

**The course overlaps following course/s:** EDA666, EDT620, EDT621

## Reading list

- David Patterson & John Hennessy: Computer Organization and Design, The Hardware/Software Interface. Kaufmann, 2013, ISBN: 9780124077263.
- Supplied material.

## Contact and other information

**Course coordinator:** Erik Larsson, [erik.larsson@eit.lth.se](mailto:erik.larsson@eit.lth.se)

**Course homepage:** <http://www.eit.lth.se/course/eitf60>