

# Computer Architecture

Programme course

6 credits

Datorarkitektur

TDTS10

Valid from: 2017 Spring semester

**Determined by**  
Board of Studies for Industrial  
Engineering and Logistics

**Date determined**  
2017-01-25

## Main field of study

Computer Science and Engineering

## Course level

First cycle

## Advancement level

G1X

## Course offered for

- Industrial Engineering and Management - International, M Sc in Engineering
- Industrial Engineering and Management, M Sc in Engineering

## Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

## Prerequisites

Switching Theory and Logical Design, Computer Hardware and Architecture

## Intended learning outcomes

This course will give students knowledge of how a computer works and an understanding of computer architecture and organization. After completing the course, the students should be able to:

- Understand and explain the overall functioning of a computer system.
- Make a connection between programs and the way they are executed on the actual hardware infrastructure.
- Evaluate the complexity of modern computer systems and identify what the main problems are and how they are solved.
- Identify the main parameters which impact the quality of a computer system, how they relate to the system complexity and, implicitly, cost.
- Understand technical specifications of microprocessors. Describe the architecture of a modern processor, evaluate and compare. Report in written and oral form.

## Course content

Components of a computer, computer performance, instruction set, RISC vs CISC, arithmetic, pipe-lining, instruction level parallelism, memory hierarchy, cache memory, virtual memory, input/output handling and interconnect structure, parallel programming, GPUs.

## Teaching and working methods

The course consists of a series of lectures, laboratory assignments and an exam.

## Examination

LAB1	Laboratory work	3 credits	U, G
TEN2	Written examination	3 credits	U, 3, 4, 5

## Grades

Four-grade scale, LiU, U, 3, 4, 5

## Department

Institutionen för datavetenskap

## Director of Studies or equivalent

Ahmed Rezine

## Examiner

Zebo Peng

## Education components

Preliminary scheduled hours: 48 h

Recommended self-study hours: 112 h

## Course literature

### Additional literature

#### Books

Patterson, David A., Hennessy, John L., (2007) *Computer organization and design : the hardware/software interface*

ISBN: 9780123706065, 0123706068, 9780123742056

Amsterdam ; Boston : Elsevier/Morgan Kaufmann, c2007.; Morgan Kaufmann series in computer architecture and design

## Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at [http://stydokument.liu.se/Regelsamling/Innehall/Utbildning\\_pa\\_grund-\\_och\\_avancerad\\_niva](http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva).