Operating Systems

Programme course

6 credits

Operativsystem

TDIU11

Valid from:

Determined by
Board of Studies for Computer Science and Media Technology

Date determined

Revision date
2017-01-25

Main field of study
Computer Science and Engineering, Programming

Course level
First cycle

Advancement level
G2F

Course offered for
- Programming
- Computer Engineering, B Sc in Engineering
- Engineering Electronics

Specific information
Can not be included in degree together with TDDB63, TDDB68, TDDB72, TDIU25.

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
Basic knowledge of computer architecture (memory, cpu, disk, bus) and how programs execute (register, address, instruction, stack, interrupt).

Intended learning outcomes
After the course the student will be able to:
- explain the fundamental reasons why we use operating systems and the problems that arise when trying to fulfil those needs.
- explain and demonstrate methods and algorithms how the fundamental parts of a computer system (processors, memory, and storage) can be shared in a secure, fair, efficient manner.
- write a summary of, and orally discuss and assess scientific articles relevant to the operating systems field

Course content

- Motivation for operating systems, overview of operating systems functions and building blocks, memory management, secondary storage, input/output, protection and security.
- Sharing of processing time: Processes, threads, scheduling.
- Sharing of memory: Continuous allocation, compaction, segmentation, paging and virtual memory with related problems, solutions and algorithms.
- Sharing of secondary storage: The file concept, file system, allocation methods (continuous, linked, indexed), free space management.
- Threats to the computer and operating system, protection methods involved in sharing of resources, protection from unauthorised use of computer resources, security.

Teaching and working methods

Students will:

- read articles and literature relevant for the field
- get complementary lectures about central concepts
- analyse parts of an existing implementation (Pintos)
- write summaries on read material
- orally discuss and read material

The course is given in Swedish to the extent possible. If Swedish speaking faculty, or suitable Swedish literature, is missing those parts will be in English.

Examination

UPG2	Hand-in assignment	1 credits	U, G
UPG1	Problem solving	3 credits	U, G
TEN1	Written examination	2 credits	U, 3, 4, 5

Operating Systems Concepts by Silberschatz A, Galvin P, Gagne G, 9th edition or later. Chosen articles relevant for the field.

Grades

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

Department

Institutionen för datavetenskap

Director of Studies or equivalent

Ahmed Reinze

Examiner

Ahmed Reinze

Education components

Preliminary scheduled hours: 28 h
Recommended self-study hours: 132 h

Course literature

Operating Systems Concepts av Silberschatz A, Galvin P, Gagne G, 9:e upplagan eller senare. Valda forskningsartiklar relevanta för ämnet.

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://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.