ID2200 Operating Systems 6.0 credits

Operativsystem

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for ID2200 valid from Spring 2015

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Information Technology

Specific prerequisites

- IS1500 Computer Organization and Components
- SF1901 Probability Theory and Statistics
- DD1390 Programme Integrating Course in Computer Science Engineering

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The course covers the implementation of operating systems and system programming.

For the course we define three levels of knowledge:

- **Good knowledge:** You should show deeper insight into the workings of, and being able to discuss a topic in detail, be able to answer non-trivial and complex questions, draw conclusions and understand how the topic interacts with other parts of the system.
- **Basic knowledge:** You should be able to discuss and describe the implementation and operation of a topic, answer non-trivial questions, draw simple conclusions and understand the impact of the topic on a system wide level.
- **Knowledge:** You should be able to answer (simple) questions on the topic and, based on knowledge acquired in the course, retrieve and understand information on the topic.

To pass the course you should have gained knowledge on the theoretical content of the course corresponding to:

Good knowledge on:

- Basic requirements on the functionality and the design of operating systems.
- Processes and process management
- Memory management, paging and management of secondary storage
- File systems
- System calls
- Interrupt and trap handling
- Inter-process communication

Basic knowledge on:

- Parallel processes and synchronization including deadlock and livelock
- Case studies: UNIX, Linux, Windows

Knowledge on:

- Computer and data security in the context of operating systems

Practical knowledge: Independently being able to design and solve larger system programming assignments using common system calls in UNIX/LINUX for process management, inter process communication, memory management and file systems.

Course contents

The course focuses on principles for the design, implementation and operation of operating systems. It also gives basic understanding of the design of operating systems for multi-core and distributed systems. The course gives the student practical skills in system programming, i.e. programs that use system calls.

The course covers:

- in-depth design of operating systems
- basic components of an operating system including: process management, virtual memory management file systems, I/O, distributed file systems, synchronization, threads and
- aspects of real-time support and basic security
- case studies (UNIX, LINUX, Windows)

An important part of the course are programming assignments in C with POSIX system calls. Target systems are UNIX/LINUX systems

Course literature

Modern Operating Systems, Andrew S. Tanenbaum. Third edition, Prentice-Hall, Inc.

Examination

- TEN1 - Examination, 3.8 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 2.2 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Lab course consisting of programming assignments with written reports. Labs should be completed no later than October 15th the academic year after the lab course was started. Lab reports can be handed in for review during the course offering, when written exams are offered or on October 15th. Review of reports can result in pass, fail or one possibility to address problems.

Other requirements for final grade

- LAB1 - Labs, 2.2 ECTS credits, grade: P, F
- TEN1 – Written exam, 3.8 ECTS credits, grade: A, B, C, D, E, FX, F

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.

- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.