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**Operating Systems**

83-301

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**Course format: Lectures and Training**

First Semester 2016/17 **Weekly hours**: 2 lecture + 1 training

1) **Course objectives**:

An operating system is a set of subsystems/programs that manage a computer system composed of hardware and software resources, providing common services/utilities needed to run system and user applications. All computers and computing devices need some kind of operating system in order to run/service their applications. This course provides students of computer science with the principles and knowledge they need to analyze and design operating systems and program applications.

2) **Course format**:

Frontal lectures – in the classroom.

Frontal training – in the classroom.

3) **Course content**:

##### Motivation for Operating Systems

##### Introduction

* + What's an Operating System
  + Computer/Operating System Overview
  + Evolution of Operating Systems
  + Functional/Protection Aspects
  + Operating System Structures

##### Concurrent Processes

* + Process Models and Management
  + Process Description and Control
  + Task/Thread Description and Control
  + Concurrency: Mutual Exclusion and Synchronization
  + Concurrency: Deadlock and Starvation

##### Memory Management

* + Real Memory Management
  + Motivation for Virtual Memory (VM)
  + Paging and Segmentation
  + Page Fetch, Placement and Replacement

##### Uniprocessor Scheduling

* + Levels of CPU Scheduling
  + Process Scheduling

##### External Storage Management

* + File Systems/Management
  + Directories
  + File Allocation
  + Disk Scheduling

4) **Prerequisites:**

As defined in the university catalog

5) **Course requirements:**

4-5 homework projects.

6) **Grading:**

Final exam: 80% ; Homework exercises: 20% ; Pass grade in the final exam is mandatory.

7) **Textbooks and supplementary reading:**

A. S. Tanenbaum and H. Bos, Modern Operating Systems, 4th Edition, Pearson, 2015.