



The Hebrew University of Jerusalem

Syllabus

OPERATING SYSTEMS - 67808

Last update 12-04-2020

HU Credits: 4

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Computer Sciences

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Prof. David Hay

Coordinator Email: David.Hay@mail.huji.ac.il

Coordinator Office Hours: Coordinate in advance

Teaching Staff:

Prof David Hay,
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Mr. Ihab,
Dr. Rosenshif Neta,
Mr.

Course/Module description:

The course provides a detailed overview of what operating systems do and how they work: their role, hardware support, performance as a function of the workload, processes and process scheduling, process interactions, address space, memory management and paging, file abstraction, inter-process communication, and distributed systems.

Course/Module aims:

Expose students to the fundamentals principles in Operating Systems, the challenges and the techniques used to achieve the desired performance.

Learning outcomes - On successful completion of this module, students should be able to:

Better understand how operating systems work and why they operate the way they do. Gain practical experience in tackling some key challenges in operating systems' design and functionality.

Attendance requirements(%):

0

Teaching arrangement and method of instruction: Frontal lectures followed by in-depth study in smaller groups and by practical exercises in solving some key issues in OS.

Course/Module Content:

Syllabus:

1. Introduction -- The role of an operating system -- Hardware support for the operating system
2. Performance evaluation -- The effect of workloads on operating systems performance -- basic notions in queuing analysis

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3. Processes -- The process abstraction -- Threads -- Multiprogramming -- Process and thread scheduling
 4. Concurrency -- Mutual exclusion -- Semaphores and locks -- Deadlock prevention and avoidance
 5. Memory management -- Virtual memory and address mapping -- Segmentation and contiguous allocation -- Demand paging -- Page replacement algorithms -- Caching
 6. File systems -- The file abstraction -- File naming and directories -- Access permissions and protection -- Data access -- File layout on disk
 7. Communication -- Interfaces for inter-process communication -- Distributed system structures and client-server systems -- Communication protocols -- Basic notions of TCP/IP -- Distributed systems services
 8. Advanced topics in OS (such as virtualization, multicore, cloud) if time permits

Required Reading:

NA

Additional Reading Material:

1. Stallings / Operating systems
2. Silberschatz, Galvin, and Gagne / Operating Systems Concepts
3. Tanenbaum / Modern Operating Systems
4. Bach / The Design of the UNIX Operating System
5. Feitelson / Operating Systems Notes (class notes)

Course/Module evaluation:

End of year written/oral examination 65 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 35 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:

There will be a bonus on attending Zoom meetings.

In addition, there might be changes of the course grade policy due to COVID-19.

Please refer to the course guidelines in the website for exact details.