

PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
COLLEGE OF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE
ABET COURSE SYLLABI

IIC2333 OPERATION SYSTEMS AND NETWORKS

Credits and contact hours: 10 credits / 10 hours (3 h. lectures; 1.5 h. assistantship; 5.5 h. Individual learning experience)

Instructor's name: Cristian Ruz

Course coordinator's name None

Textbook:

- *Operating Systems Concepts*. Silberschartz, A.; Galvin, P.; Gagne, G. (2013). 9th Edition. John Wiley & sons inc.
- *Computer Networks*. Tanenbaum, A.; Wetherall, D. (2011). 5th Edition. Prentice Hall.

Course Catalog Description: This course teaches the fundamental aspects involved in the design and implementation of operating systems, focusing in the concepts, techniques, and methods used in modern operating systems and networks for data communication.

Prerequisite Courses: IIC2343 Computer architecture

Co-requisite Courses: None

Status in the Curriculum: Required

Course Learning Outcomes:

1. Identify and explain the subsystems of an operating system, including its goals and implementation mechanisms.
2. Explain the limitations and advantages of the mechanisms used on each subsystem.
3. Design and implement improvements to limitations found in specific implementations.
4. Design and model small to medium sized computer networks.
5. Evaluate network problems, isolating the appropriate layer and identifying possible causes using a systematic procedure.
6. Determine good network solutions taking into account issues like cost, flexibility and security.
7. Describe the behavior and effects of abnormal functioning of subsystems of an operating system, and of network components.

**Relation of Course to ABET
Criteria:**

- a. Knowledge of mathematics, science and engineering
- c. Design a system, component, or process
- e. Identify, formulate, and solve engineering problems
- j. Knowledge of contemporary issues
- k. Techniques, skills, and modern tools for engineering practice.

Topics covered:

1. Evolution of operating systems and networks. Hardware considerations: protection, interruptions. Software considerations: interfaces, system calls.
2. Processes: resource allocation, inter-process communication, threads, synchronization, scheduling, deadlocks.
3. Memory Management: memory allocation, addressing, swapping. Memory segmentation and paging. Virtual memory.
4. File Systems and I/O. Disk scheduling. Disk block allocation. File systems design and implementation.
5. Network models. Classification and communication models.
6. Physical and Data Link Layers. Transmission media. Frames. Error correction. Medium Access Layer.
7. Network Layer. Network addressing and routing.
8. Transport Layer: error checking, congestion control. UDP and TCP.
9. Application Layer. DNS, HTTP, protocols, content delivery networks. Proxies.