Course Title	**Operating Systems**				
Course Code	**CSC206**				
Course Type	**Major Elective**				
Level	BSc/1st Cycle				
Year / Semester	2nd/4th				
Teacher's Name	Angelina Vidali				
ECTS	7.5	**Lectures / week**	3 hours	**Laboratories / week**	2 hours
Course Purpose and Objectives	To provide students with the basic understanding of what an operating system is and how it works. The lesson demonstrates the problems encountered by operating systems, and focuses on applications of specialized software in a real environment				
Learning Outcomes	Upon successful completion of the course, students will be able to: • Explain the role and main functions of the operating system. • Describe the various functions of the procedures as well as the process programming algorithms. • Analyze critical segment problem and software and material solutions to this problem. • Provide a description of the deadlocks and methods to prevent or avoid dead ends in a computer system. • Describe various memory management techniques and explain the concepts of the virtual memory system. • Explain the operation of file systems, file system design, and system protection. • Describe the new trends in operating system design.				
Prerequisites	-	**Required**	-		
Course Content	Introduction and overview of the operating system. Meaning of operating systems. Operating systems, as resource managers. The need for Operating Systems, what they do and how they are designed. Protection of Operating Systems. The main resources of the system: The Material: Hardware Overview. Main memory. Central processing unit, memory registers. Input and output devices. Secondary storage devices. Interfaces. Control unit. Channels. Process Management: The concept of process and synchronization. Process programming, process intercom, process synchronization, and deadlock handling. Critical section: Problem and solutions (software, markers, etc.). Classical				

	synchronization problems (readers and writers, philosophers, etc). Characterization of deadlock. Methods for handling deadlock. Preventing deadlocks. Avoiding deadlocks. Banker's Algorithm. Deadlock Detection. Multiprogramming and Time Sharing: Software for multiprogramming and time allocation. Time allocation of central processing unit. Main memory allocation. process planning. Memory registers. Distribution of input / output devices. Checking data resources. Manage secondary storage. Memory Management: Memory allocation and management. Processor management and priorities. Switches and control flow. Distribution of input / output devices. Segmentation. Paging and Virtual Memory. Partitioning systems. Paging systems. Virtual memory. Virtual memory application. File Systems: Physical data storage. File tasks (create, record, read, delete). Access methods (sequential, index, etc.). Cataloging systems (single level, tree-structured). File Protection. Trends in the design of the operating system. Case study of typical operating system (Windows, Unix, Solaris). Recent developments and contemporary issues related to the subject matter of the course.
Teaching Methodology	Lectures 42 hours Labs 30 hours
Bibliography	A.Silberschatz,, Operating System Concepts, 10th Edition, Wiley, 2017 T.Anderson, M.Dahlin. Operating Systems: Principles and Practice, 2nd Edition, Recursive Books, 2014
Assessment	Final Exam 60% Mid-Term/Lab Exam 20% Assignments 20%
Language	English