

Course unit title:	Operating Systems
Course unit code:	CSC327
Type of course unit: (Compulsory/optional)	Compulsory (Foundation)
Level of course unit: (First, second or third cycle)	Bachelor (1st cycle)
Year of study:	3
Semester when the unit is delivered:	6
Number of ECTS credits allocated:	6
Name of lecturer(s):	TBA
Learning outcomes of the course unit:	
<p>Upon successful completion of this course students should be able to:</p> <ul style="list-style-type: none"> • Explain the role and main functionalities of the Operating System. • Describe the various features of processes as well as CPU-scheduling algorithms. • Analyse the critical-section problem and its software and hardware solutions. • Provide a description of deadlocks and methods for preventing or avoiding deadlocks in a computer system. • Describe various memory-management techniques and explain the concepts of a virtual memory system. • Explain the function of file systems, file system design and file system protection. • Describe new trends in operating system design. 	
Mode of delivery:	Face- to- face
Prerequisites and co-requisites:	CSC205, CSC214
Recommended optional program components:	None
Course Contents:	
<p>Objective: To provide the students with a basic understanding of what an operating system is and how it works. To illustrate the problems handled by operating systems, and concentrate on the applications of this specialized software to a real-world environment.</p>	

Description:

Introduction and overview of an operating system; importance of operating systems; operating systems as resource managers; The need of Operating Systems, what they do and how they are designed. Operating system protection.

The basic system resources:

The hardware; an overview; main memory; the central processing unit, the registers; input and output devices; the secondary storage devices; interfaces; control unit; and channels.

Process Management:

The process concept and concurrency. Process scheduling, interprocess communication, process synchronization, and deadlock handling. Critical-Section; Problem and solutions (software, semaphores etc). Classical Problems of Synchronization (The Readers and Writers, Dining-Philosophers etc). Deadlock characterization. Methods for handling Deadlocks. Deadlock Prevention. Deadlock Avoidance. The Banker's Algorithm. Deadlock Detection.

Multiprogramming and Time-sharing:

Software for multiprogramming and Time-sharing; allocating CPU time; main memory allocations; job scheduling; registers; Input/Output device allocation; control of data resources; secondary storage space management.

Memory Management:

Memory allocation and memory management; processor management and priorities; interrupts and the flow of control; input/output device allocation; Segmentation; Paging and Virtual memory; segmentation systems; paging systems; virtual memory; implementing virtual memory.

File Systems:

Physical storage of data. File operations (create, write, read, delete). Access methods (sequential, index etc.). Directory Systems (single-level, tree-structured). File Protection.

Trends in Operating system design; case study typical OS (Windows, UNIX, Solaris).

Recent developments and contemporary issues pertaining to the subject-matter of the course.

**Recommended
or
required reading:**

Silberschatz/Galvin, OPERATING SYSTEM CONCEPTS, Addison-Wesley

William Stallings, OPERATING SYSTEMS INTERNALS AND DESIGN PRINCIPLES, Prentice Hall

Gary Nutt, OPERATING SYSTEMS, Addison-Wesley

	Andrew Tanenbaum, S., OPERATING SYSTEMS-DESIGN AND IMPLEMENTATION, Prentice Hall						
Planned learning activities and teaching methods:	<table border="0"> <tr> <td>Class Instruction</td> <td style="border: 1px solid black; text-align: center;">42 Hours</td> </tr> <tr> <td>Consultation/Computer Lab</td> <td style="border: 1px solid black; text-align: center;">15 Hours</td> </tr> </table>	Class Instruction	42 Hours	Consultation/Computer Lab	15 Hours		
Class Instruction	42 Hours						
Consultation/Computer Lab	15 Hours						
Assessment methods and criteria:	<table border="0"> <tr> <td>Examinations</td> <td style="border: 1px solid black; text-align: center;">75%</td> </tr> <tr> <td>Assignments/ Class Participation/Project</td> <td style="border: 1px solid black; text-align: center;">25%</td> </tr> <tr> <td></td> <td style="border: 1px solid black; text-align: center;">100%</td> </tr> </table>	Examinations	75%	Assignments/ Class Participation/Project	25%		100%
Examinations	75%						
Assignments/ Class Participation/Project	25%						
	100%						
Language of instruction:	English						
Work placement(s):	No						
Place of Teaching:	<p>Theoretical Part: Regular Classroom European University Cyprus, Nicosia</p> <p>Practical Part: Computer Laboratory European University Cyprus, Nicosia</p>						