

Operating Systems					
Credit Hours:	2	Course Code:	COSC-3118	Prerequisites:	None
Course Learning Outcomes (CLOs):					
At the end of the course, the students will be able to:				Domain	BT Level*
1. Understand the characteristics of different structures of the Operating Systems and identify the core functions of the Operating Systems				C	2
2. Analyze and evaluate the algorithms of the core functions of the Operating Systems and explain the major performance issues with regard to the core functions				C	5
3. Demonstrate the knowledge in applying system software and tools available in modern operating systems.				C	3
* BT= Bloom’s Taxonomy, C=Cognitive Domain, P=Psychomotor Domain, A=Affective Domain					
#	SDG	Relevant CLOs			
1	SDG 4: Quality Education	CLO 1: Understand the characteristics of different structures of the Operating Systems and identify the core functions of the Operating Systems			
2	SDG 9: Industry, Innovation and Infrastructure	CLO 3: Demonstrate the knowledge in applying system software and tools available in modern operating systems.			
Course Contents:					
Operating systems basics, system calls, process concept and scheduling, inter-process communication, multithreaded programming, multithreading models, threading issues, process scheduling algorithms, thread scheduling, multiple-processor scheduling, synchronization, critical section, synchronization hardware, synchronization problems, deadlocks, detecting and recovering from deadlocks, memory management, swapping, contiguous memory allocation, segmentation & paging, virtual memory management, demand paging, thrashing, memory-mapped files, file systems, file concept, directory and disk structure, directory implementation, free space management, disk structure and scheduling.					
Teaching Methodology:					
Lectures, Written Assignments, Practical labs, Presentations.					
Course Assessment:					
Mid Term Exams, Final Term Exams, Assignments, Quizzes, Project, Presentations, Practical Exam					
Reference Material:					
1.Operating Systems Concepts, 9th edition by Abraham Silberschatz 2.Modern Operating Systems, 4th edition by Andrew S. Tanenbaum 3.Operating Systems, Internals and Design Principles, 9th edition by William Stallings					
Operating Systems - Lab					
Credit Hours:	1	Course Code:	COSC-3218	Prerequisites:	None
Course Learning Outcomes (CLOs):					
At the end of the course, the students will be able to:				Domain	BT Level*
1. Understand the characteristics of different structures of the Operating Systems and identify the core functions of the Operating Systems				C	2

2.	Analyze and evaluate the algorithms of the core functions of the Operating Systems and explain the major performance issues with regard to the core functions	C	5
3.	Demonstrate the knowledge in applying system software and tools available in modern operating systems.	C	3
* BT= Bloom’s Taxonomy, C=Cognitive Domain, P=Psychomotor Domain, A=Affective Domain			
#	SDG	Relevant CLOs	
1	SDG 4: Quality Education	CLO 1: Understand the characteristics of different structures of the Operating Systems and identify the core functions of the Operating Systems	
2	SDG 9: Industry, Innovation and Infrastructure	CLO 3: Demonstrate the knowledge in applying system software and tools available in modern operating systems.	
Course Contents:			
Basic installations, Shell Scripting, Pwd, Ls, Cd, ls/bin, ls -l /etc /bin, ls -la, process creation, fork, wait, exit, getpid and getppid Unix System Calls, Process Creation Exec System Call, Threads, Shell Scripting Functions implementation, Shell Scripting: Echo, ls, cd, man, date, cal, grep, cp, cat, mv, rm, touch.mkdir, pwd, clear, exit, head and tail, sort, less, Navigation directories, write and execute shell script, File modes and permissions, variables in shell, user-defined or shell variables, parametric variables, input values, conditional statements implementation, testing conditions implementations, string comparisons practices, Case statements implementation, Arithmetic operations practices, loop executions.			
Teaching Methodology:			
Lectures, Written Assignments, Practical labs, Presentations.			
Course Assessment:			
Mid Term Exams, Final Term Exams, Assignments, Quizzes, Project, Presentations, Practical Exam			
Reference Material:			
1.Operating Systems Concepts, 9th edition by Abraham Silberschatz			
2.Modern Operating Systems, 4th edition by Andrew S. Tanenbaum			
3.Operating Systems, Internals and Design Principles, 9th edition by William Stallings			