MULTIMEDIA UNIVERSITY®

COURSE INFORMATION

1 .	**Name of Course**	Operating System	
2 .	**Course Code**	DCS 5058	
3 .	**Type of Course** **(e.g. : Core, major, elective etc.)**	Core/Major	
4 .	**Synopsis**	This course provides a theoretical foundation for understanding operating systems. Students will learn the structure of computer and operating system, the processes and threads, CPU scheduling, memory managament, virtual memory and file system.	
5 .	**Version** **(State the date of theSenate's approval - previous and the current approval date)**	Current: Nov 2017 Previous: June 2017 New version : ADC Nov 2017 Senate meeting 195 2018	
6 .	**Name(s) of Academic Staff**	Chandrika Mohd Jayothisa, Lim Liyen, Noor Hisham Bin Kamis, Nurasma' Shamsuddin, Rubiah Binti Yunus, Ruzanna Abdullah, Suraya Nurain Binti Kalid, **Yap Hui Yen**	
7 .	**Semester and Year Offered**	Semester 2, Year 1	
8 .	**Credit Value**	3	
9 .	**Pre-Requisite**	None	
10 .	**Objective of the course in the programme:**		
	To provide a clear fundamentals and concepts that underlie operating system. Students should be able to understand the operating system fundamentals concepts and algorithms which are offered in any general operating system.		
11 .	**Justification for including the course in the programme:**		
	This subject will be useful for the students to understand how an operating system performs in a computer system.		
12 .	**Course Learning Outcomes (CLO)**	**Domain**	**Level**
	CLO1: Explain the concepts, structure and design of operating system.	Cognitive	2
	CLO2: Illustrate how OS manages computer resources and solves computational problems by using several algorithms methods.	Cognitive	3
	CLO3: Demonstrate basic functionalities of different OS basic shell and command line.	Cognitive	3
	CLO4:		

13 . **Mapping of the Course Learning Outcomes to the Programme Learning Outcomes, Teaching Methods and Assessment:**

Course Learning Outcomes (CLO) (Must tally with CLOs in item 12)	Programme Learning Outcomes (PLO)								Teaching Methods	Assessment Method
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8		
CLO1	✓								Lecture/Tutorial	Mid Term Test, Quiz & Final Exam
CLO2						✓			Lecture/Tutorial	Assignment
CLO3	✓								Lab	Lab Test
Total	**2**					**1**			*Indicate the relevancy between the CLO and PLO by ticking "✓" the appropriate relevant box (This description must be read together with standards 2.1.2, 2.2.1, and 2.2.2 in Area 2 – pages 16 & 18 of COPPA 2.0)*	

14 . **Transferable Skills:**

Problem Solving

15 . **Distribution of Student Learning Time (SLT)**

	Course Content Outline	**CLO	Teaching and Learning Activities – Guided Learning (F2F)* *L	*T	*P	*O	Guided Learning (NF2F)*	Independent Learning (NF2F)*	Total SLT
1	**Topic 1: Introduction to OS** This chapter introduces what an operating system in. The role of operating system will be discussed in this chapter too. This chapter also discusses various operating systems such as mainframe systems, simple batch systems, multiprogrammed systems, time-sharing systems, parallel systems, distributed systems and real time systems.	**1**	2	2		0.5		3	7.5
2	**Topic 2: Computer-System Structures** This chapter describes computer-system operation. This chapter identifies I/O structure, storage structure and storage hierarchy. This chapter also discusses the concept of dual-mode operation. Hardware Protection such as memory protection, I/O protection and CPU protection will be discussed.	**1**	2	2		1		3	8
3	**Topic 3: Operating-System Structures** This chapter reviews operating system components which include process management, memory management, file management and secondary storage management. Operating-system services will be discussed. System calls, system programs, system structure, virtual machine are also covered. This chapter also describes system design and implementation.	**1**	2	2		0.5		3	7.5
4	**Topic 4: Processes & Threads** This system introduces concept of process and process states. Operation on a process such as process creation, process termination and process suspension will be covered. Process description which includes operating system control structures will be discussed. Thread synchronization and multithreading models are covered as well.	**1**	2	2				3	7
5	**Topic 5: CPU Scheduling** This chapter introduces process scheduling and discusses basic concepts of CPU scheduling and determines the scheduling criteria. This chapter demonstrates how scheduling algorithms works. Multiple-processor scheduling, real-time scheduling and algorithm evaluation are included in this chapter.	**1, 2**	4	2				6	12
6	**Topic 6: Deadlocks** This chapter introduces system model and resource allocation graph. Characteristics of deadlocks will be discussed in this chapter. This chapter also includes demonstrating methods for handling deadlocks which consists of deadlock prevention, deadlock avoidance and deadlock recovery.	**1, 2**	4	2				6	12
7	**Topic 7: Memory Management** This chapter identifies the background of memory management and swapping. Contiguous Memory Allocation and various memory management techniques such as paging, segmentation, fixed partitioning and dynamic partitioning will be covered in this chapter.	**1, 2**	4	2		1		6	13

8	**Topic 8: Virtual Memory** This chapter introduces the background of virtual memory and demand paging. The concept of page replacement will be discussed in this chapter. Page replacement algorithms will be demonstrated in this chapter. This chapter also covers frame allocation and thrashing.	**1, 2**	2	2		1		3	8
9	**Topic 9: File Systems** This chapter reviews concept of file, file system structure, directory implementation and structure. Different types of access methods will be included in this chapter. File protection, allocation methods, free-space management in file system will be discussed.	**1, 2**	2	2				3	7
10	**Lab 1: DOS Basic Shell** Recognize basic DOS commands in terms of changing directories, creating files and directories, removing files and directories, viewing file contents, when a command does not work. This also includes coping, moving and renaming files.	**3**			2			2	4

	11	**Lab 2: LINUX Basic** Introduce LINUX commands in terms of changing directories, creating files and directories, removing files and directories, viewing file contents, when a command does not work. This also includes coping, moving and renaming files.	**3**			2			2	4
								Total SLT	**90**

SUMMATIVE ASSESSMENT

1. Continuous Assessment	**Percentage %**	**Total SLT**
Assignment	10%	6
Mid Term Test	20%	2
Quiz	10%	2
Lab Test	10%	2
Total SLT for Continuous Assessment		**12**

2. Final Assessment	**Percentage %**	**Total SLT**	
		F2F	**ILT**
Final Exam	50%	2	16
Total SLT for Final Assessment (F2F + NF2F)		**18**	
Grand Total	**100%**	**120**	

****Indicate the CLO based on the CLO's numbering in Item 12.**
***L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face**

16 . **Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room):**

17 . **Main References:**

1. William, S. (2015). Operating Systems: Internal and Design Principles (8th ed.). Prentice Hall.

18 . **Additional References:**

1. Silberschatz, A., Galvin, P. B., & Gagne, G. (2013). Operating System Concepts (9th ed.). John Wiley.

Note:

Cells shaded light grey contain formulas / fixed values. Edit these formulas only if needed.