

1	Course Name:	Operating Systems and Computer Architecture										Version Number:	VE1																																																																																																																																																																																									
	Course Code:	CT049-3-1										Effective Date:	01 Mar 2023																																																																																																																																																																																									
	Course Classification:	Elective (Core)																																																																																																																																																																																																				
2	Synopsis:	This module provides an understanding of fundamental concepts and principles of computer systems including the architecture and operating systems. Students will be introduced to the main components and operations of a computer systems, including data representation, logic gates, CPU, memory and I/O peripherals. In addition, this module will also introduce students to principles of CPU scheduling mechanisms, memory management techniques and file systems management. Current trends, issues and technical implications of modern computer systems and operating systems will also be discussed in this module to explore the ethical and professionalism context.																																																																																																																																																																																																				
3	Name(s) of Academic Staff:	1	Abubakar S. Santuraki																																																																																																																																																																																																			
		2	Ts Umapathy Eaganathan																																																																																																																																																																																																			
		3	Hazlina Haron																																																																																																																																																																																																			
4	Semester and Year offered:	See Programme Specification (Module may be delivered on multiple programmes and therefore in different years/semesters)																																																																																																																																																																																																				
5	Credit Value:	3																																																																																																																																																																																																				
6	Pre-requisite/ co-requisite (if any):																																																																																																																																																																																																					
7	Course Learning Outcomes (CLO)	<table border="1"> <tr> <td>CLO1</td> <td>Explain fundamental principles and organisation of computer systems hardware and software including operating systems concepts, process and systematic workflow (C2, PLO1)</td> </tr> <tr> <td>CLO2</td> <td>Explain current trends, issues and implications in relation to computer technology, architecture and OS virtualization from the perspective of ethics and professionalism (A3, PLO11)</td> </tr> <tr> <td>CLO3</td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </table>												CLO1	Explain fundamental principles and organisation of computer systems hardware and software including operating systems concepts, process and systematic workflow (C2, PLO1)	CLO2	Explain current trends, issues and implications in relation to computer technology, architecture and OS virtualization from the perspective of ethics and professionalism (A3, PLO11)	CLO3																																																																																																																																																																																				
CLO1	Explain fundamental principles and organisation of computer systems hardware and software including operating systems concepts, process and systematic workflow (C2, PLO1)																																																																																																																																																																																																					
CLO2	Explain current trends, issues and implications in relation to computer technology, architecture and OS virtualization from the perspective of ethics and professionalism (A3, PLO11)																																																																																																																																																																																																					
CLO3																																																																																																																																																																																																						
8	Mapping of the Course Learning Outcomes to the Programme Learning Outcomes, Teaching Methods and Assessment Methods																																																																																																																																																																																																					
	<table border="1"> <tr> <th rowspan="3">Course Learning Outcomes</th> <th colspan="10">Programme Learning Outcomes (PLO)</th> <th rowspan="3">Teaching Methods</th> <th rowspan="3">Assessment Methods</th> </tr> <tr> <th>Knowledge and Understanding</th> <th>Cognitive Skills</th> <th>Practical Skills</th> <th>Interpersonal Skills</th> <th>Communication Skills</th> <th>Digital Skills</th> <th>Numeracy Skills</th> <th>Leadership, autonomy and responsibility</th> <th>Personal Skills</th> <th>Entrepreneurial Skills</th> <th>Ethics and professionalism</th> </tr> <tr> <th>PLO 1</th> <th>PLO 2</th> <th>PLO 3</th> <th>PLO 4</th> <th>PLO 5</th> <th>PLO 6</th> <th>PLO 7</th> <th>PLO 8</th> <th>PLO 9</th> <th>PLO 10</th> <th>PLO 11</th> </tr> <tr> <td>CLO1</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Lecture</td> <td>Final Exam</td> </tr> <tr> <td>CLO2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>✓</td> <td></td> <td>Tutorial / Case Study</td> <td>Group Assignment</td> </tr> <tr> <td>CLO3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mapping with MQF Cluster of Learning Outcomes</td> <td>C1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>													Course Learning Outcomes	Programme Learning Outcomes (PLO)										Teaching Methods	Assessment Methods	Knowledge and Understanding	Cognitive Skills	Practical Skills	Interpersonal Skills	Communication Skills	Digital Skills	Numeracy Skills	Leadership, autonomy and responsibility	Personal Skills	Entrepreneurial Skills	Ethics and professionalism	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	CLO1	✓												Lecture	Final Exam	CLO2											✓		Tutorial / Case Study	Group Assignment	CLO3																																																																											Mapping with MQF Cluster of Learning Outcomes	C1																																											
Course Learning Outcomes	Programme Learning Outcomes (PLO)										Teaching Methods	Assessment Methods																																																																																																																																																																																										
	Knowledge and Understanding	Cognitive Skills	Practical Skills	Interpersonal Skills	Communication Skills	Digital Skills	Numeracy Skills	Leadership, autonomy and responsibility	Personal Skills	Entrepreneurial Skills			Ethics and professionalism																																																																																																																																																																																									
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10			PLO 11																																																																																																																																																																																									
CLO1	✓												Lecture	Final Exam																																																																																																																																																																																								
CLO2											✓		Tutorial / Case Study	Group Assignment																																																																																																																																																																																								
CLO3																																																																																																																																																																																																						
Mapping with MQF Cluster of Learning Outcomes	C1																																																																																																																																																																																																					
	<p>Indicate the primary causal link between the CLO and PLO by ticking '✓' in the appropriate box.</p> <p>C1 = Knowledge &amp; Understanding, C2 = Cognitive Skills, C3A = Practical Skills, C3B = Interpersonal Skills, C3C = Communication Skills, C3D = Digital Skills, C3E = Numeracy Skills, C3F = Leadership, Autonomy &amp; Responsibility, C4A = Personal Skills, C4B = Entrepreneurial Skills, C5 = Ethics &amp; Professionalism</p>																																																																																																																																																																																																					
9	<p>Transferable Skills (if applicable)</p> <p>(Skills learned in the course of study which can be useful and utilized in other settings)</p> <table border="1"> <tr> <td>1</td> <td>Ethics and Professionalism</td> </tr> <tr> <td>2</td> <td></td> </tr> <tr> <td>3</td> <td></td> </tr> <tr> <td colspan="2">Open-ended response (if any)</td> </tr> <tr> <td>4</td> <td></td> </tr> </table>													1	Ethics and Professionalism	2		3		Open-ended response (if any)		4																																																																																																																																																																																
1	Ethics and Professionalism																																																																																																																																																																																																					
2																																																																																																																																																																																																						
3																																																																																																																																																																																																						
Open-ended response (if any)																																																																																																																																																																																																						
4																																																																																																																																																																																																						
10	<p>Distribution of Student Learning Time (SLT)</p> <p>Note: This SLT calculation is designed for home grown programme only.</p>																																																																																																																																																																																																					

Course Content Outline and Subtopics		CLO*	Learning and Teaching Activities**										Total SLT
			Face-to-Face (F2F)								NF2F Independent Learning (Asynchronous)		
			Physical				Online/ Technology-mediated (Synchronous)						
			L	T	P	O	L	T	P	O			
1	Overview of Computer Systems	1	2									4	
2	Data Representation	1	4									4	
3	Logic Gates	1	4									4	
4	CPU and Memory	1	4									4	
5	Input/Output and Computer Peripherals	1	2									4	
6	Operating Systems Concepts	1	2									4	
7	Process Control Management	1	4									4	
8	Memory Management	1	4									4	
9	File Systems Management	1	2									4	
10	Trends and Issues in Computer Technology	2		2								4	
11	Computer Technology Critique and Implications	2		2								4	
12	Modern Operating Systems	2		2								2	
13	Case Study : Virtualization	2		4								8	
14	Case Study : OS Configuration and Deployment	2		4								8	
15													
16													
17													
18													
19													
20													
SUB-TOTAL SLT:												104	
Continuous Assessment		%	Face-to-Face (F2F)								NF2F Independent Learning for Assessment (Asynchronous)		
			Physical				Online/ Technology-mediated (Synchronous)						
1	Group Assignment	40										8	
2													
3													
4													
5													
SUB-TOTAL SLT:												8	
Final Assessment		%	Face-to-Face (F2F)								NF2F Independent Learning for Assessment (Asynchronous)		
			Physical				Online/ Technology-mediated (Synchronous)						
1	Final Exam	60		2								6	
2													
3													
4													
5													
SUB-TOTAL SLT:												8	
SLT for Assessment:												16	
GRAND TOTAL SLT:												120	
A	[Total F2F Physical / (Total F2F Physical + Total F2F Online + Total Independent Learning) x 100]											36.67	
B	[(Total F2F Online + Total Independent Learning) / (Total F2F Physical + Total F2F Online + Total Independent Learning) x 100]											63.33	
C	[% F2F Physical Practical + % F2F Online Practical]												
C1	[Total F2F Physical Practical / (Total F2F Physical + Total F2F Online + Total Independent Learning) x 100]												
C2	[Total F2F Online Practical / (Total F2F Physical + Total F2F Online + Total Independent Learning) x 100]												
Please tick (v) if this course is Industrial Training/ Clinical Placement/ Practicum using 50% of Effective Learning Time (ELT)												<input type="checkbox"/>	
Note: * Indicate the CLO based on the CLO's numbering in Item 8 ** For ODL programme: Courses with mandatory practical requirements imposed by the programme standards or any related standards can be exempted from complying to the minimum 80% ODL delivery rule in the SLT.													
11	Identify special requirement or resources to deliver the course (e.g., software, nursery, computer lab, simulation room etc)												

12	References (include required and further readings, and should be the most current)	Irv Englander, Wilson Wong (2021) The Architecture of Computer Hardware, Systems Software, and Networking: An Information Technology Approach 6th Edition. ISBN : 978-1119495208 Meyers,M.(2019) CompTIA A+ Certification All-in-One Exam Guide (Exams 220-901&220-902). 10th Ed. USA: McGraw-Hill Education. ISBN-13: 978-1260454031 Silbertschatz, A., Gagne, G. & Galvin, P. (2021) Operating System Concepts. 10th Edition. USA: Wiley Publishing. ISBN-13: 978-1119800361 Tannenbaum, A. & Bos, H. (2022). Modern Operating Systems 5th Edition. Pearson. ISBN-13 : 978-0137618873
13	Other additional information (if applicable)	
Note: Number of PLO indicated is purely for illustration purposes only and the number is subjected to the curriculum design.		