

**SUMMARY OF INFORMATION ON EACH COURSE**

1.	Name of Course	Computer Architecture and Organisation	
2.	Course Code	TAO 1221	
3.	Status of Course [Applies to (cohort) ]	Common Core for B.IT (Hons) Data Communications and Networking B.IT (Hons) Information Technology Management B.IT (Hons) Artificial Intelligence B.IT (Hons) Security Technology B.Sc (Hons) Bioinformatics	
4.	MQF Level/Stage	Bachelor – MQF Level 6	
5.	Version (State the date of the Senate approval – history of previous and current approval date)	Date of previous version: June 2012 Date of current version: June 2014	
6.	Pre-Requisite	None	
7.	Name(s) of academic/teaching staff	Mohd Fikri Azli Bin Abdullah Hiew Bee Yan	
8.	Semester and Year offered	Trimester 2, Year 1	
9.	<b>Objective of the course in the programme :</b>  This course provides thorough discussions on the fundamentals of computer organization and architecture and relates this to contemporary design issues. This will cover system buses, structures and functions of different central processing units, control units, characteristics and functions of different instruction sets, addressing modes, memory, input/output, parallel processing and multi-core computing.		
10.	<b>Justification for including the course in the programme :</b> This course will cover historical development of computers and evolution of Intel multi-core processors and IBM power processors. Topics such as elements of system bus design, interrupts, organization of registers (with Intel 8085, Intel 8086, and Motorola 68000 microprocessors as examples), study of instruction cycle and pipelining, study of arithmetic and logic unit with integer and floating-point arithmetic algorithms, study of hardwired and micro-programmed control unit, and study of instruction set characteristics, functions, formats, addressing modes (with Intel 8085 and Intel 8086 as examples) will be included		
11.	Course Learning Outcomes :	Domain	Level

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	LO1	Describe the evolution of computer architectures.								Cognitive	1
	LO2	Identify and explain the structures and functions of the primary components of computer such as system buses, registers, ALU, control unit, memory, input-output devices and also the characteristics of instructions sets of typical microprocessors								Cognitive	2
	LO3	Demonstrate the ability to write simple assembly language programs and also programs for the programmable peripheral interface device with different interfacing techniques.								Cognitive	3
	LO4	Construct the best solution and organization of single processor systems, symmetric multiprocessors clusters, non-uniform memory access and chip-level multiprocessors in response to problems associated with computer architectures.								Cognitive	3
12.	Mapping of Learning Outcomes to Programme Outcomes :										
	Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	
	LO1	X									
	LO2	X	X								
	LO3		X								
	LO4		X								
13.	Assessment Methods and Types :										
	Method and Type	Description/Details							Percentage		
	Final Examination	Written examination							50%		
	Mid Term Test	Written examination							25%		
	Lab Test	Lab activities Test							25%		
14.	Mapping of assessment components to learning outcomes (LOs)										
	Assessment Components	%	LO1	LO2	LO3	LO4					
	Final Examination	50	66.67	50	50	100					
	Mid Term Test	25	33.33	25	25						
	Lab Test	25		25	25						
15.	Details of Course										
	Topics							Mode of Delivery			
								Lecture	Lab		

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<b>1. Introduction</b> Brief History of Computers, Designing for Performance, Pentium and PowerPC Evolution, Computer Component, Computer Functions, Interconnection Structure, Bus Interconnection and PCI		6	4
<b>2 CPU structure and function</b> Processor Organization, Register Organization, The Instruction Cycle, Instruction Pipelining, processors, Micro-operations, Control of The Processor		6	4
<b>3 .Computer Arithmetic</b> The Arithmetic and Logic Unit (ALU), Integer representation, Integer arithmetic, Floating-Point Representation, Floating-Point Arithmetic		6	4
<b>4 .Instruction Set Design</b> Machine Instruction Characteristics, Types of Operands, Type of Operations, Data Types and Operation Types, Addressing, Instruction Formats, Processor Addressing Modes and Instruction Formats		6	4
<b>5. Memory System Architecture</b> Computer Memory System Overview, Semiconductor Main Memory, Cache Memory, Cache Organization, Advanced DRAM Organization.		6	4
<b>6. Input/ Output</b> External Devices, I/O Modules, Programmed I/O, Interrupt Driven I/O, Direct Memory Access, I/O Channels and Processors, The External Interface.		6	4
<b>7. Introduction to Advanced Computer Architecture</b> Multiple Processor Organizations, Symmetric Microprocessors, Cache Coherence and the MESI Protocol, Clusters, Non-uniform Memory Access.		6	4
Total		42	28
Total Student Learning Time (SLT)	Face to Face / Guided Learning	Independent Learning	
Lecture	42	42	
Tutorials			
Laboratory/Practical	28	14	

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	Lab test	2	4
	Assignment		
	Mid Term Test	2	4
	Final Exam	2	20
	Sub Total	76	84
	Total SLT		160
	Credit Value		4.0
16.	Reading Materials :		
17.	Textbooks		
	1. William Stallings, (2012). Computer Organization and Architecture, 9 <sup>th</sup> Edition, Prentice Hall.		
	Reference Material (including 'Statutes' for Law)		
	1. Miles Murdocca, Vincent P. Heuring, (1999). Principles of Computer Architecture, First Edition, Engineering/Science/Mathematics.		
	2. Andrew S. Tanenbaum, (2012). Structured Computer Organization, Sixth Edition, Engineering/Science/Mathematics.		
	3. Patterson, D. and Hennessy, J. (2013). Computer Organization & Design - The Hardware/Software Interface, 5 <sup>th</sup> Ed., Morgan Kaufmann Publishers.		
	4. Gaoengar, (2002). Microprocessors: Architecture, Programming and Applications with 8085, 5 <sup>th</sup> Ed., John Wiley & Sons.		

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Appendix (to be compiled when submitting the complete syllabus for the programme) :

1. Mission and Vision of the University and Faculty
2. Programme Objectives or Programme Educational Objectives
3. Programme Outcomes (POs)
4. Mapping of POs to the 8 MQF domain
5. Summary of the Bloom's Taxonomy's Domain Coverage in all the Los in the format below :

Subject	Learning Outcomes (please state the learning Outcomes)	Bloom's Taxonomy Domain		
		Affective	Cognitive	Psychomotor
ABC1234	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			
DEF5678	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			

6. Summary of LO to PO measurement
7. Measurement and Tabulation of result for LO achievement
8. Measurement Tabulation of result for PO achievement