MULTIMEDIA UNIVERSITY®

COURSE INFORMATION

1 .	**Name of Course**	Computer Architecture
2 .	**Course Code**	DCS5158
3 .	**Type of Course** **(e.g. : Core, major, elective etc.)**	Core/ Major
4 .	**Synopsis**	This course addresses the importance of architectural concepts of a microprocessor. Students will learn how central processing unit processes instructions, data representation, instruction set design. The importance of memory systems, bus architecture, input and output system, pipelining techniques will be covered too.
5 .	**Version** **(State the date of theSenate's approval - previous and the current approval date)**	Current: ADC 10 2017 Senate Jan 2018 Previous: ADC June 2017
6 .	**Name(s) of Academic Staff**	Erma Haryani binti Esahar, **Lim Liyen**, Mohd Azizi bin Sanwani, Muhammad Loqman bin Samat, Noor Hisham bin Kamis, Nun Shwu Huey, Ruzanna binti Abdullah, Usha Vellappan
7 .	**Semester and Year Offered**	Trimester 2, Year 2
8 .	**Credit Value**	4
9 .	**Pre-Requisite**	None

10 . **Objective of the course in the programme:**

To introduce the architectural and organisational design of a typical microprocessor system in terms of components and functions of a computer system, instructions processing by a processor, machine instruction design, memory system architecture. It also discusses the importance of bus architecture, input and output interfaces in computer architecture.

11 . **Justification for including the course in the programme:**

To enable students to understand computer architecture as it acknowledges the existence of computer organisation by introducing the historical development of computers, instruction set design, addressing modes, instruction cycle and pipelining as well as system bus design. The importance of this subject could be traced from the basic functions of computer to the real understanding of how central processing unit operates and executes instructions.

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** This chapter presents the introduction of computer architecture as well as classifications of architectures. This chapter also includes history of computers and designing for performance. Also, this chapter includes the explanation of computer components and computer functions.	**CLO1, CLO2**	4	2				4	10
2	**Topic 2: Data representations** This chapter introduces the Arithmetic and Logic Unit (ALU), integer representation and integer arithmetic. This chapter also presents various number bases inclusive of binary number system and hexadecimal number system. This chapter also introduces floating-point representation.	**CLO1, CLO2**	6	2				6	14
3	**Topic 3: Instruction-Set Architecture** This chapter describes machine instruction characteristics and instruction cycle. Besides, this chapter also discusses types of operands and type of operations. Also, this chapter covers data types, elements of machine instructions and instruction representations. Addressing modes is also included.	**CLO1, CLO3**	6	4				6	16
4	**Topic 4: Memory-System Architecture** This chapter describes characteristics of memory and memory hierarchy. Semiconductor main memory subsystems, cache memory, cache organisation and external memory will be discussed. This chapter includes the discussion of design issues of memory system.	**CLO2**	6	4			2	6	18

5	**Topic 5: Buses** This chapter begins by differentiating internal and external bus. Bus interconnection, bus hierarchy, characteristics of bus, various bus standards such as PCI and PCI Express are also covered in this chapter.	**CLO1**	4	2			1	4	11
6	**Topic 6: Input Output Interfaces** This chapter reviews external devices, I/O modules structure and function, I/O techniques which inclusive of programmed I/O, interrupt-driven I/O, and direct memory access (DMA). The external interfaces is also covered in this chapter.	**CLO1**	4	2			2	6	14
7	**Topic 7: Pipelining and RISCs** This chapter introduces instruction pipelining and discusses the performance of pipelining. This chapter also describes characteristics of RISC and distinguishes between RISCs and CISCs.	**CLO1**	6	2			2	6	16
8	**Lab 1: Introduction to 8085 Simulator** The brief introduction on 8085 simulators which inclusive of the basic operation of the simulator will be covered. Basic 8085 instructions will be introduced.	**CLO4**			2			2	4
9	**Lab 2: Assembly Language Program** This topic will cover the assembly language program for arithmetic operations such as addition, subtraction, multiplication and division.	**CLO4**			4			4	8
								Total SLT	**111**

SUMMATIVE ASSESSMENT

1. Continuous Assessment	**Percentage %**	**Total SLT**
Test	20%	5
Quizzes	10%	4
Lab/Tutorial Submissions	10%	12
Assignment	10%	6
Total SLT for Continuous Assessment		**27**

2. Final Assessment	**Percentage %**	**Total SLT**	
		F2F	**ILT**
Final Exam	50%	2	20
Total SLT for Final Assessment (F2F + NF2F)		**22**	

Grand Total	**100%**	**160**

****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):**
8085 simulator (j8085 simulator), Computer Lab

17 . **Main References:**
Stallings, W. (2016). Computer Organization and Architecture, 10th Ed., Prentice Hall.

18 . **Additional References:**