

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Computer Organization & Architecture		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	CET2103			
ECTS Credits	6			
SWL (hr/sem)	180			
Module Level	2	Semester of Delivery		3
Administering Department	CET	College	EETC	
Module Leader	Aseel Hameed Majeed		e-mail	aseel_Alnakkash@mtu.edu.iq
Module Leader's Acad. Title	Assis. Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Dalal Abdulmohsin Hammood		e-mail	Dalal.hammood@mtu.edu.iq
Peer Reviewer Name	Dr. Mahmoud Shuker Mahmoud		e-mail	mahmoud.shukur@mtu.edu.iq
Scientific Committee Approval Date	13/06/2023	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Understand the basic components and organization of a computer system. 2. Explain the function and operation of the CPU, memory, and I/O devices. 3. Analyze and evaluate different computer architectures and their trade-offs. 4. Design and implement basic computer systems using appropriate hardware and software components. 5. Demonstrate an understanding of the relationship between computer organization and computer performance. 6. Apply knowledge of computer organization principles to solve real-world computing problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the basic components and organization of a computer system. 2. Explain the function and operation of the CPU, memory, and I/O devices. 3. Analyze and evaluate different computer architectures and their trade-offs. 4. Design and implement basic computer systems using appropriate hardware and software components. 5. Demonstrate an understanding of the relationship between computer organization and computer performance. 6. Apply knowledge of computer organization principles to solve real-world computing problems. 7. demonstrate the ability to evaluate and compare different computer organization techniques, such as memory management strategies and caching optimizations, to improve system performance. 8. Understand computer architectures, including their performance characteristics, and understand the impact of design choices on computer performance 9. Develop practical skills in using simulation tools, emulators, and programming languages to design, implement, and test computer organization concepts. 10. Analyze and identify performance bottlenecks in computer systems and propose appropriate optimizations to improve system efficiency. 11. Understand the principles and challenges of memory management, including

	memory allocation, deallocation, and garbage collection. 12. Apply knowledge of cache memory organization and mapping techniques to analyze cache behavior and optimize cache utilization.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to Computer Organization Basic computer architecture and components Von Neumann architecture Instruction execution cycle Memory Organization Memory hierarchy and cache memory Virtual memory and paging techniques Memory management and allocation strategies PU Organization and Instruction Set Architecture (ISA) CPU components: ALU, registers, control unit Instruction formats and addressing modes Input/Output (I/O) Organization I/O devices and interfaces Polling, interrupts, and DMA I/O communication and bus architectures

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	106	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	7.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	180		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1-4 , LO #4-9
	Assignments	2	10% (10)	2, 12	LO # 1-10
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1-10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Computer system Organization
Week 2	Main parts of computer system, Organization and architecture
Week 3	Von Neumann architecture and its components
Week 4	Instruction Set Design in Von Neuman
Week 5	Overview of instruction execution cycle
Week 6	Introduction to Memory unit
Week 7	Memory Organization & classification
Week 8	Prime Memory :RAM ,ROM ,EPROM ,EEPROM& Storage memory :,Hard disk ,CD ROM
Week 9	Concepts of Microprocessors &Microcomputer & Microcontroller
Week 10	Organization of MP base system
Week 11	Instruction formats and addressing modes
Week 12	Machine language & Assembly language
Week 13	Input/Output (I/O) Organization
Week 14	Polling, interrupts, and DMA
Week 15	Pipelining and Instruction-Level Parallelism
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Computer Organization ,Familiarization with the lab environment and tools
Week 2	Lab 2: hardware components: CPU, memory, and I/O devices
Week 3	Lab 3: Computer assembly and disassembly
Week 4	Lab 4: Introduction to PC Operating Systems
Week 5	Lab 5: Installation and setup of the chosen PC operating system
Week 6	Lab 6: Assembly Language Programming
Week 7	Lab 7: Writing and executing simple assembly language programs

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Computer Organization and Design" by David A. Patterson and John L. Hennessy	Yes
Recommended Texts	Structured Computer Organization" by Andrew S. Tanenbaum	No
Websites	https://www.tutorialspoint.com/computer_organization/index.asp	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54). The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.