MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Microprocessors 2			**Module Delivery**	
Module Type	Core			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	COE306				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	3		**Semester of Delivery**	5	
Administering Department	Computer		**College**	College of Engineering	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	PhD	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	24/08/2024		**Version Number**	1.1	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COE201 Microprocessors 1	**Semester**	3
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- How to relate the skills and concepts learned from Microprocessors 1 course to understand the concepts of this course 2- Understand the different components of a microcomputer system 3- Design some parts of a microcomputer system 4- Develop the required software to program it 5- The course also includes lab, which supports the theoretical part through processor-based learning kits and simulation software.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon the completion of this course the students should: 1. Understand the interaction between microprocessor and memory and IO devices 2. Understand the protected mode memory operation 3. Be able to interface basic I/O device to the microprocessor 4. Be able to interface and control different I/O devices through the 8255 controller 5. Understand the interrupt structure and operation 6. Be able to interface and program the 8259 interrupt controller 7. Understand the operation of other controllers
Indicative Contents المحتويات الإرشادية	- Microprocessor interaction with memory and IO devices - Protected mode of memory operation - Interface of basic I/O devices to the microprocessor - Interface and write program to control different IO devices through the 8255 controller - Interrupt structure, interrupt operation, and interrupt controller interface and programming. - Other controllers operation

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	In class lectures supported by lab sessions are the main teaching and learning methods. This is supported by classwork, class discussions, homeworks, and assignments or mini-projects. Class discussions are included to expand the critical thinking and the ability to analyze and discuss processor related concepts.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem)	71	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5

الحمل الدراسي غير المنتظم للطالب خلال الفصل			
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	20%	3,6,11,13	(1 & 2), (3 & 4), 5, 7
	Assignments and HWs	2	5%	7,12	(3&4), (5&6)
	Projects / Lab.	Weekly	15%		1, 3, 4, 5
Summative assessment	**Midterm Exam**	1 (2 hours)	10%	8	1 – 4
	Final Exam	1 (4 hours)	50%	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Processor interaction with memory and IO
Week 2	Memory management in protected mode
Week 3	Basic I/O interface
Week 4	8255 Programmable peripheral controller mode 0
Week 5	8255 with 7-segment displays
Week 6	8255 with stepper motor
Week 7	8255 with key matrix
Week 8	Mid Exam
Week 9	Interrupt Structure and interface
Week 10	Expanding interrupt structures
Week 11	Command words of the 8259 interrupt controller
Week 12	Programming the 8259 interrupt controller
Week 13	Introduction to other controllers Interval controller, DMA controller, and 16550 controller.

Week 14	Introduction to other controllers Interval controller, DMA controller, and 16550 controller.
Week 15	Review and Preparation for final exam
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	EXP 1: Introducing the 8086 based learning kit
Week 2	EXP 2: Leds and switches using the learning jit
Week 3	EXP 3: Led matrix using the learning kit
Week 4	EXP 4: Introducing the Proteus simulator
Week 5	EXP 5: Leds and switches using Proteus
Week 6	EXP 6: Dc motor using Proteus
Week 7	EXP 7: Stepper motor using Proteus
Week 8	EXP 8: 7 segment using Proteus
Week 9	EXP 9: key matrix using Proteus
Week 10	EXP 10: Traffic light using Proteus
Week 11	EXP 11: Interrupt using Proteus
Week 12	EXP 12: Mini project
Week 13	EXP 13: Mini Project
Week 14	EXP 13: Mini project
Week15	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**The Intel Microprocessors, 8086/8088, 80186/80188, 80286,… Core" by Barray B, Brey**	Y
Recommended Texts	Datasheets of 8255, 8254, 8259 controllers Datasheet of 8086-based learning kit User guide of Proteus	N (available for free online)
Websites		

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.