



Form: Course Syllabus	Form Number	EXC-01-02-02A
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Course Syllabus

1	Course title	Microprocessors and Microcontrollers Applications
2	Course number	0908434
3	Credit hours	3
	Contact hours (theory, practical)	3 theoretical hours
4	Prerequisites/corequisites	Object-Oriented Problem Solving (0907342) + Industrial Communication Systems and Networks (0908333)
5	Program title	B.Sc. in Mechatronics Engineering
6	Program code	0908434
7	Awarding institution	The University of Jordan
8	School	School of Engineering
9	Department	Mechatronics Engineering Department
10	Course level	Forth Year
11	Year of study and semester (s)	2023/2024 Second semester
12	Other department (s) involved in teaching the course	None
13	Main teaching language	English
14	Delivery method	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online
15	Online platforms(s)	<input checked="" type="checkbox"/> Moodle <input type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....
16	Issuing/Revision Date	5/10/2023



Descriptors	ILO/ID	Program SOs	SO (5)
		ILOs of the course	
Knowledge	A1	Understand the underlying basic concepts of Logic by examining basic logic gates using principles from K-map simplification	
	A2	Understand the pivotal role of microcontroller in embedded systems, showcasing knowledge of their subsystems of inputs and outputs.	
Skills	B1	Design and implement an effective Embedded system solution, incorporating principles from software and hardware to meet specific system requirements.	
	B2	Evaluate and apply hardware/software for system analysis, showcasing proficiency in selecting appropriate component to address the embedded system challenges.	
	B3	Apply embedded system design principles to solve real-world problems, demonstrating practical skills and understanding their relevance in computing-based solutions.	
	B4	Apply ADC and Serial communication protocols for data analysis and transmission, and evaluate their suitability in addressing complex computing challenges.	
Competence	C1	Demonstrate competency in executing signal conditioning techniques, ensuring the quality and reliability of signals for subsequent computing-based analyses through proficient application of relevant methods and tools.	
	C2	Apply PWM process with proficiency to implement DAC assess comprehensive analogue control, justifying the selection based on specific computing requirements within the program's discipline.	

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Course aims and outcomes:



A- Aims:

The course motivates the student to acquire the knowledge, skills and attitudes of recognition the concept of embedded systems and ability to program and interface the PIC Microcontroller

B- Students Learning Outcomes (SLOs):

Upon successful completion of this course, students will be able to:

SLOs	SLO (1)	SLO (2)	SLO (3)	SLO (4)	SLO (5)	SLO (6)	SLO (7)
SLOs of the course							
Analyze a complex Embedded system and to apply principles of design and other relevant disciplines to identify solutions.							
Design, implement, and evaluate a embedded system-based solution to meet a given set of computing requirements in the context of the program's discipline.							
An ability to function effectively on a team whose members together provide leadership in a Microprocessors and Microcontrollers topics					X		
Create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives when using Microcontrollers in Embedded Systems					X		

23. Topic Outline and Schedule:



Week	Lecture	Topic	ILO/s Linked to the Topic	Learning Types (Face to Face/ Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous Lecturing	Evaluation Methods	Learning Resources
1	1.1	Course Overview	A1	Face to Face	Moodle Teams	Synchronous	Exams	E-learning portal + Book
	1.2	Chapter 1 Introduction to Microprocessor	A1	Face to Face	Moodle Teams	Synchronous	Exams	E-learning portal +
	1.3	Chapter 1 Introduction to Microprocessor	A1	Face to Face	Moodle Teams	Synchronous	Exams	Book
2	2.1	Chapter 1 Introduction to Microprocessor	B1	Face to Face	Moodle Teams	Synchronous	Exams	E-learning portal +
	2.2	Chapter 1 Introduction to Microprocessor	B1	Face to Face	Moodle Teams	Synchronous	Exams	Book
	2.3	Chapter 1 Introduction to Microprocessor	B1	Face to Face	Moodle Teams	Synchronous	Exams	E-learning portal +
3	3.1	Chapter 1 Introduction to Microprocessor	B1	Face to Face	Moodle Teams	Synchronous	Exams	Book



	3.2	Chapter 2 Microcontroller Hardware	B1	Face to Face	Moodle Teams	Synchronou s	Exams	E- learning portal +
	3.3	Chapter 2 Microcontroller Hardware	B1	Face to Face	Moodle Teams	Synchronou s	Exams	Book
4	4.1	Chapter 2 Microcontroller Hardware	C1	Face to Face	Moodle Teams	Synchronou s	Homew ork, Exams	E- learning portal +
	4.2	Chapter 2 Microcontroller Hardware	C1	Face to Face	Moodle Teams	Synchronou s	Homew ork, Exams	Book
	4.3	Chapter 2 Microcontroller Hardware	C1	Face to Face	Moodle Teams	Synchronou s	Homew ork, Exams	E- learning portal +
5	5.1	Chapter 3 Microcontroller Software	B1	Face to Face	Moodle Teams	Synchronou s	Exams	Book
	5.2	Chapter 3 Microcontroller Software	B1	Face to Face	Moodle Teams	Synchronou s	Exams	E- learning portal +
	5.3	Chapter 3 Microcontroller Software	B1	Face to Face	Moodle Teams	Synchronou s	Exams	Book



6	6.1	Chapter 3 Microcontroller Software	B1	Face to Face	Moodle Teams	Synchronou s	Exams	E- learning portal +
	6.2	Chapter 3 Microcontroller Software	B1	Face to Face	Moodle Teams	Synchronou s	Exams	Book
	6.3	Chapter 4 Advance Microcontroller	B1	Face to Face	Moodle Teams	Synchronou s	Exams	E- learning portal +
7	7.1	Chapter 4 Advance Microcontroller	B2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book
	7.2	Chapter 4 Advance Microcontroller	B2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
	7.3	Chapter 4 Advance Microcontroller	B2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book
8	8.1	Chapter 5 Timers	B2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
	8.2	Mid Term Chapters (1-4)	B2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book
	8.3	Mid Term Discussion	B2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
9	9.1	Chapter 5 Timers	B3	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book



	9.2	Chapter 5 Timers	B3	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
	9.3	Chapter 5 Timers	B3	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book
10	10.1	Chapter 6 USART	B3	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
	10.2	Chapter 6 USART	B3	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book
	10.3	Chapter 6 USART	B3	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
11	11.1	Chapter 6 USART	B4	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book
	11.2	Chapter 7 ADC	B4	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
	11.3	Chapter 7 ADC	B4	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book
12	12.1	Chapter 7 ADC	B4	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
	12.2	Chapter 7 ADC	B4	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book



	12.3	Chapter 8 Microcontroller Interface	B4	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
13	13.1	Chapter 8 Microcontroller Interface	A2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book
	13.2	Chapter 8 Microcontroller Interface	A2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
	13.3	Chapter 9 18 Series + C	A2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book
14	14.1	Chapter 9 18 Series + C	A2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
	14.2	Chapter 9 18 Series + C	A2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book
	14.3	Chapter 9 18 Series + C	A2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
15	15.1	Course Discussion and Feedback	C2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book
	15.2		C2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	E- learning portal +
	15.3		C2	Face to Face	Moodle Teams	Synchronou s	Assign ments, Exams	Book



24. Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	ILO/s Linked to the Evaluation activity	Period (Week)	Platform
Quizzes	10	Chapters 1, 3 and 6		4 th , 7 th and 12 th	Moodle
Project	10		5	10 th week	Moodle
Midterm Exam	30	Chapters 1-4		8 th week	Moodle
Final Exam	40	All topics			Moodle

25. Course Requirements:

Each student should have a computer (with MS Project, MS Excel, and MS Word installed) and internet connection.

26. Course Policies:

A- Attendance policies:

Students are expected to attend EVERY CLASS SESSION and they are responsible for all materials, announcements, schedule changes, etc., discussed in class

B- Absences from exams and submitting assignments on time:

There will be no make-up exams for any exam or missed assignment, which will be taken during the course. Exceptions to this rule is restricted only to the following cases:

- Death of only first order relatives (father, mother, sister, or brother).
- Hospital entry (inpatient) during the time of the examination.



Any other cases will be given the zero mark in the corresponding exam or assignment.

C- Health and safety procedures:

Students are responsible for:

- Keeping themselves informed of conditions affecting their health and safety;
- Participating in safety training programs;
- Following to health and safety practices in their workplace, classroom;
- Advising of or reporting unsafe practices or serious hazards in the classroom or laboratory.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

Follow the UoJ guidelines that providing definitions, procedures, and recommendations for promotion and violation of academic honesty and integrity.

E- Grading policy:

Follow the UoJ guidelines that providing definitions of undergraduate grading policy

F- Available university services that support achievement in the course:

Text book, class handouts, and an access to Personal Computer with office software

27. References:

A- Required book(s), assigned reading and audio-visuals:

Designing Embedded Systems with PIC Microcontrollers: Principles and Applications, Tim Wilmshurst, Newnes, 2007

B- Recommended books, materials, and media:

1. K. Irvine, Assembly Language for Intel-based Computers 4 Ed., Prentice Hall 2003
2. Tim Wilmshurst, An Introduction to the Design of Small-Scale Embedded Systems.
3. Barry B. Brey, The Intel Microprocessors, Architecture, Programming and Interfacing, Prentice Hall
4. W. Triebel, A. Singh, The 8088 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware, and Applications (4th Edition) Prentice Hall, 2003

28. Additional information:



Name of the Instructor or the Course Coordinator: Dr. Musa Al Yaman	Signature: Musa	Date: 31/1/2024
Name of the Head of Quality Assurance Committee/ Department	Signature:	Date:
Name of the Head of Department	Signature:	Date:
Name of the Head of Quality Assurance Committee/ School or Center	Signature:	Date:
Name of the Dean or the Director	Signature:	Date: