



Course Syllabus

1	Course title	Embedded Systems	
2	Course number	1905330	
3	Credit hours	3	
	Contact hours (theory, practical)	3 theoretical hours	
4	Prerequisites/corequisites	Data structures (1901242) and AI Programming (1905320)	
5	Program title	B.Sc. in Artificial Intelligence	
6	Program code	1905330	
7	Awarding institution	The University of Jordan	
8	School	King Abdullah II School for Information Technology	
9	Department	Artificial Intelligence Department	
10	Course level	Third Year	
11	Year of study and semester (s)	2024/2025 First 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	6/10/2024	

17 Course Coordinator:

Name: Dr. Musa AlYaman	Contact hours: Sunday 11:30-12:30, Tuesday 11:30-12:20
Office number: 202 Mechatronics Engineering Department	Phone number: : 5355000 Ext. 23032
Email: m.alyaman@ju.edu.jo	



18 Other instructors:

None

19 Course Description:

The course aims to introduce students to basic logic design system, logic gates, combinational and sequential logic circuits. Then basic input and output devices, after that microcontroller-based embedded systems design, development and implementation with focus on real-time applications.

Topics to be covered include, basic logic design, basic input and output systems. Embedded system types, microcontroller architecture, programming (Embedded C), interrupt management and other related topics. This course will use a combination of lectures, class discussions, reading and writing assignments, case studies analysis, and hands-on work. Practical hands-on computer vision best practices will be given in Lab weekly.

20 Course aims and outcomes:

A- Aims:

The course motivates the student to recognize the concept of Embedded Systems, identify the benefits and requirements of microcontrollers, the knowledge in the application of embedded systems.

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							
1. Identify the benefits and requirements of embedded system.				X			
2. Recognize the different types of microcontrollers.				X			
3. Practice the oral communication skills in a form of presentation and the written communication skills in a form of report				X			

21. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Day/Date
1	1.1	Course Overview	4	Face to Face		Synchronous		Monday 7/10/2024
	1.2	Numbering Systems	4	Face to Face		Synchronous		Wednesday 9/10/2024
2	2.1	Basic Logic Gates and K-maps	4	Face to Face		Synchronous		Monday 14/10/2024
	2.2	Lab 1 (mm_logic Introduction)	4	Face to Face		Synchronous		Wednesday 16/10/2024
3	3.1	K-maps	4	Face to Face		Synchronous		Monday 21/10/2024
	3.2	Combinational Circuits 1	4	Face to Face		Synchronous		Wednesday 23/10/2024
4	4.1	Combinational Circuits 2	4	Face to Face		Synchronous		Monday 28/10/2024
	4.2	Lab 2 (Combinational Circuits)	4	Face to Face		Synchronous		Wednesday 30/10/2024
5	5.1	Mux's & Decoders	4	Face to Face		Synchronous		Monday 4/11/2024
	5.2	Sequential Circuits 1	4	Face to Face		Synchronous		Wednesday 6/11/2024
6	6.1	Sequential Circuits 2	4	Face to Face		Synchronous		Monday 11/11/2024
	6.2	Lab 3 (Sequential Circuits)	4	Face to Face		Synchronous		Wednesday 13/11/2024
7	7.1	Registers	4	Face to Face		Synchronous		Monday 18/11/2024
	7.2	Counters	4	Face to Face		Synchronous		Wednesday 20/11/2024

8	8.1	Mid Exam (Logic Design)	4	Face to Face		Synchronous	Project Available: 13:30	Monday 25/11/2024
	8.2	Lab 4 (Registers and Counters)	4	Face to Face		Synchronous		Wednesday 27/11/2024
9	9.1	Embedded Systems Introduction	4	Face to Face		Synchronous		Monday 2/12/2024
	9.2	Microcontroller Hardware	4	Face to Face		Synchronous		Wednesday 4/12/2024
10	10.1	Microcontroller Software	4	Face to Face		Synchronous		Monday 9/12/2024
	10.2	Lab 5 (Mplab Introduction)	4	Face to Face		Synchronous		Wednesday 11/12/2024
11	11.1	Interrupts	4	Face to Face		Synchronous		Monday 16/12/2024
	11.2	Timers	4	Face to Face		Synchronous		Wednesday 18/12/2024
12	12.1	ADC	4	Face to Face		Synchronous		Monday 23/12/2024
	12.2	Holiday	4	Face to Face		Synchronous		Wednesday 25/12/2024
13	13.1	Communication	4	Face to Face		Synchronous		Monday 30/12/2024
	13.2	Holiday						Wednesday 1/1/2025
14	14.1	Project Discussion	4	Face to Face		Synchronous	G1+G2+G3	Monday 6/1/2025
	14.2	Project Discussion	4	Face to Face		Synchronous	G4+G5+G6	Wednesday 8/1/2025
15	15.1	Course Discussion	4	Face to Face		Synchronous		Monday 13/1/2025
	15.2							Wednesday 9/10/2024



22 Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Labs	10	5 labs			Moodle
Project	15		4		Moodle
Midterm Exam	25	Digital Logic	4	8 th week	Moodle
Final Exam	50	All topics	4		Moodle

23 Course Requirements

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

24 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

25 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. Digital Design, M. Mano 3 Ed., Prentice Hall 2002
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

26 Additional information:

--

Name of Course Coordinator: Dr. Musa AlYaman-----Signature: ----- Date: 6/10/2025
Head of Curriculum Committee/Department: ----- Signature: ----- ---
Head of Department: ----- Signature: ----- -
Head of Curriculum Committee/Faculty: ----- Signature: ----- -
Dean: ----- Signature: -----