The University of Jordan
School of Engineering
Mechatronics Engineering Department
2nd Semester – A.Y. 2024/2025

Course Portfolio

for the purpose of ABET accreditation

Course Number: **0908435**
Course Name: **Microprocessors and Microcontrollers Applications**
Credit Hours: **1**
Course Type: **Required**
Course Laval: **4th Year**

Academic Year: **2024/2025**
Semester: **2nd**
Total Students: **32**
Instructor: **Dr Musa Alyaman**

CHECKLIST:

Please indicate below the supporting material you included in the
course portfolio whether electronically or in the paper-based file:

	Submit	Audit
1. Course Syllabus (latest revision)	☑	☐
2. Course Assessment by Students (CAS)	☑	☐
3. Course Assessment by Faculty (CAF)	☑	☐
4. Course Report	☑	☐
5. Sample Exams/Quizzes/Projects/Reports/Homeworks (Minimum, Average and Maximum)	☑	☐

Submitter name: **Date of submission:**
Eng.Hisham Mohammad   **Saturday, 24 June 2023**

Auditor name: **Date of audit:**

The University of Jordan
School of Engineering
Mechatronics Engineering Department
2nd Semester – A.Y. 2024/2025

Course:	**Microprocessors and Microcontrollers Applications Lab – 0908435** **(1 Cr. – RequiredCourse)**
Instructor:	Dr Musa Alyaman
	Office: MX-116, Telephone: 06/5355000 ext 23034, Email:h_mohammad@ju.edu.jo
	Office Hours: Sun Tue Thu 09:00-11:00AM, Wed 09:30-11:00AM
Course website:	http://elearning.ju.edu.jo
Catalog description:	Introduction to embedded systems and their applications through experimental exercises. HDL codes. basic combinational and sequential logic circuits including simulation, automatic placement and routing, timing analysis and testing. hands-on experience in programming using off-the-shelf embedded system development kits. a comprehensive project that include design, implementation, and evaluation of a prototype embedded system.
Prerequisites by course:	0908322 +0908434 or co-requisite Microprocessors and Microcontrollers Applications (pre- or co-requisite) (0908434)
Prerequisites by topic:	Students are assumed to have sufficient knowledge pertaining to the following: 1.Digital Logic fundamentals 2.Programming with MATLAB. 3.Electrical and electronics circuits fundamentals.
Textbook:	**Lab Sheets**
References:	1. Tim Wilmshurst, Designing Embedded Systems with PIC Microcontrollers: Principles and Applications, Newnes, 2007. Main Textbook. 2. Tim Wilmshurst, An Introduction to the Design of Small-Scale Embedded Systems, Palgrave, 2001. 3. K. Irvine, Assembly Language for Intel-based Computers 4 Ed., Prentice Hall 2003
Schedule:	12 Weeks, 12 labs (150 minutes each), plus exams.
Course goals:	1. Ability to design and construct a complete simple embedded system hardware. 2. Ability to program and interface embedded systems for industrial applications

Course learning outcomes (CLO) and relation to ABET student outcomes (SO):

Upon successful completion of this course, a student should: **[SO]**
1. Recognize the concept of Embedded System.
2. Perform programming of Microprocessors and Microcontrollers using multiple platforms.
3. Team Working Essentials   **[5]**

Course topics: Hrs

1. **Distribution of Lab Syllabus to the students.**	**0**
2. **Introduction to Lab**	**3**
3. **MPLAB Basics(1)-Memory Decoding**	**3**
4. **MPLAB Basics(2)- Instructions Set Classification**	**3**
5. **Implementing Instructions (1)- Subroutines (Functions) and Macros**	**3**
6. **Implementing Instructions (2)-EEPROM Handling**	**3**
7. **Basic Programming-Bottle labeling and packing machine**	**3**
8. **Timers (Hardware + Software)**	**3**
9. **Serial Communication**	**3**
10. **A/D Converter**	**3**
11. **PWM**	**3**
12. **Interfacing with PIC**	**3**
13. **Project**	**15**

Ground rules: Attendance is required and strictly enforced. To that end, attendance will be taken every lecture; Absence of more than 5hours will result in the expulsion of the student from the course.

Assessment & grading policy:

Assignments	0%	Quizzes	0%
First Exam	0%	Projects	15%
Midterm	30%	Lab Work	15%
Final Exam	40%	Presentation	0%
		Total	**100%**

Last Revised: February 21, 2023

CAS: Course assessment by students

Course learning outcomes indirectly assesed by students

Course Number:	**0908435**
Course Name:	**Microprocessors and Microcontrollers Applicat**
Credit Hours:	**1**
Course Type:	**Required**

Academic Year:	**2024/2025**
Semester:	**2nd**
Instructor:	**Dr Musa Alyaman**

Total students in class: **32**

No.	Course learning outcome (CLO)	[SO]	1 Poor	2 Fair	3 Good	4 V. Good	5 Excellent	[out of 5] Average*	Evaluating students
1.	Recognize the concept of Embedded System.	0	0	2	4	3	8	**4**	17
2.	Perform programming of Microprocessors and Microcontrollers using multiple platforms.	0	0	1	4	4	8	**4.12**	17
3.	Team Working Essentials	[5]	2	1	3	6	20	**4.28**	32

NOTE: The Average is calculated based on the following weights: Excellent = 5, Very Good = 4, Good = 3, Fair = 2, Poor = 1, and the number of students who provided those evaluations.

SUMMARY: For a final analysis of individual student outcome (SO) scores from the above CAS results, please see the course report. The final score for a particular SO will be evaluated by considering the scores of the different CLOs affecting that SO and combining them using equal weights.

Student Comments:
1.

Course Grades

Course Number: **0908435**   Academic Year: **2024/2025**
Course Name: **Microprocessors and Microcontrollers App** Semester: **2nd**
Credit Hours: **1**
Course Type: **Required**   Instructor: **Dr Musa Alyaman**

Student outcome to be assessed: **[5]**

Student ID	Project P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
(Optional) Pts	15																			
1	14																			
2	14																			
3	14																			
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31	**11**																		
32	**11**																		

CAF: Course assessment by faculty
Student outcomes directly assesed by faculty

Course Number: **0908435**	Academic Year:	**2024/2025**
Course Name: **Microprocessors and Microcontrollers Appl**	Semester:	**2nd**
Credit Hours: **1**		
Course Type: **Required**	Instructor:	**Dr Musa Alyaman**

Total students in class: **32**

Assignment	Description	[SO]	[0, 1] Poor	(1, 2] Fair	(2, 3] Good	(3, 4] V. Good	(4, 5] Excellent	[out of 5] Average	Evaluating students
P1 (15 pts)	Project	[5]	0	0	0	17	15	**4.47**	32
P2									
P3									
P4									
P5									

NOTE: The Average is calculated based on the following weights: Excellent = 5, Very Good = 4, Good = 3, Fair = 2, Poor = 1, and the number of students who obtained those score levels.

SUMMARY: For a final analysis of individual student outcome (SO) scores from the above CAF results, please see the course report. The final score for a particular SO will be evaluated by considering the scores of the different assignments affecting that SO and combining them using equal weights.

Course Report

Student outcomes as assesed by both faculty and students

Course Number:	**0908435**	
Course Name:	**Microprocessors and Microcontrollers Applications Lab**	
Credit Hours:	**1**	
Course Type:	**Required**	

Academic Year:	**2024/2025**
Semester:	**2nd**
Instructor:	**Dr Musa Alyaman**

CAS Benchmark:	**2.5**	[out of 5]	*for satisfactory perofrmance*
CAF Benchmark:	**2.5**	[out of 5]	*for satisfactory perofrmance*

Total students in class: **32**

[SO]	Student outcome description	CAS Average	CAF Average	Comment
1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics			N.A.
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	**4.28**	**4.47**	Satisfactory perofrmance

Student actual grade distribution in this class:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F	Average
0	1	1	0	3	4	5	1	0	2	0	0	2.31

[out of 4.0]

Instructor's recommendations: **Date:**   Saturday, 24 June 2023

Nothing

Focus group or ABET committee recommendations: **Date:**

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Changes or corrective action taken (if necessary):   **Date:**

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