The University of Jordan
School of Engineering
Mechatronics Engineering Department
1st Semester – A.Y. 2019/2020

Course:	**Microprocessor and Microcontroller – 0908431 (3 Cr. – Required)**
Instructor:	Dr. Musa Al Yaman
	Office: CH305, Mechatronics Engineering Department, Telephone: 5355000 ext. 23032
	Office Hours: (Sum, Tus:9.00-10.00 am), (Mon, Wed: 09.30-11.00)
Course website:	http://elearning.ju.edu.jo
Catalog description:	Embedded systems characteristics. Microprocessors versus micro controllers. Micro controller characteristics. General-purpose micro controllers. Interrupts, counters/timers, Input/output ports. Microcontroller programming. Instruction set. Program development and use of assemblers. Memory maps and addressing modes. Digital to analogue and analogue to digital conversion in micro controllers. Data acquisition and distribution. Serial and parallel communications. Real-time system and its constraints. Interfacing to external devices. Power consumption consideration. Applications.
Prerequisites by course:	CPE 0907231 Digital Logic (pre-requisite)
Prerequisites by topic:	Students are assumed to have sufficient knowledge pertaining to the following: 1. Digital Logic fundamentals 2. Programming with MATLAB.
Textbook:	**Tim Wilmshurst, Designing Embedded Systems with PIC Microcontrollers: Principles and Applications, Newnes, 2007**
References:	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
Schedule:	15 Weeks, 12 lab (180 minutes each), mid exam and project

Course goals: 1.   Recognize the concept of embedded systems
2.   Ability to program and interface the PIC Microcontroller

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

Upon successful completion of this course, a student should: **[SO]**

1.	An ability to function effectively on a team whose members together provide leadership in a Microprocessors and Microcontrollers topics	**5**
2.	Create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives when using Microcontrollers in Embedded Systems	**5**

Course topics: Hrs.

1.	Introduction to Microprocessor and Microcontroller	**4**
2.	Microcontroller Hardware	**4**
3.	Microcontroller Software	**4**
4.	Advanced Microcontroller (Hardware + Software)	**4**
5.	Microcontroller Timers	**4**
6.	Microcontroller USART	**4**
7.	Microcontroller PWM + ADC	**4**
8.	Microcontroller Interface.	**4**

Ground rules:

• Attendance
Students are expected to attend EVERY CLASS SESSION and they are responsible for all material, announcements, schedule changes, etc., discussed in class. The university policy regarding the attendance will be strictly adhered to.

• Make up Examinations
There will be no make-up exams for any exam that will be taken during the course. Exceptions to this rule is restricted only to the following cases:-
1. Death of only first order relatives (father, mother, sister, or brother).
2. Hospital entry (in-patient) during the time of the examination.
Any other cases will be given the zero mark in the corresponding exam.

• Special Notes
1. Seating plan will be as given in the attendance sheet.
2. Students creativity is welcomed and will receive additional marks

Assessment & grading policy:

Project (5)	10%
Quizzes	15%
Midterm	25%
Final Exam	50%
Total	**100%**

Last Revised: September 2, 2019