Jordan University of Science and Technology
Faculty of Engineering
Biomedical Engineering Department

BME464 Microcontrollers And Embedded Lab
Second Semester 2022-2023

Course Catalog
1 Credit Hours. 1 Credit hours (3 h lab) Experiments in microcontrollers and embedded system design using Arduino development boards. Design and implementation of several interfacing tasks; interfacing with simple I/O devices like switches, LED, analog sensors. Communicating with sensor modules with various communication protocols. Biopotential Signal acquisition and real-time signal processing. Virtual system design, cloud programming, simulation and debugging.

Text Book	
Title	Exploring Arduino Tools and Techniques for Engineering
Author(s)	Wizardry , J. Blum
Edition	2nd Edition
Short Name	Ref #1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #2	Arduino Microcontroller Processing for Everyone! Part I&II	Steven F. Barrett	4th Edition	

Instructor	
Name	**Dr. Yazan Al Dweiri**
Office Location	C5 L2
Office Hours	Sun : 11:30 - 13:00 Tue : 13:30 - 14:30 Wed : 14:00 - 15:30 Thu : 08:00 - 10:00
Email	ymaldweiri@just.edu.jo

Class Schedule & Room

Section 1:
  Lecture Time: Sun : 14:30 - 17:30
  Room: LAB
 	
Section 2:
  Lecture Time: Tue : 14:30 - 17:30
  Room: LAB

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
282300	BME230 Tools For Biomedical Engineers	Prerequisite / Study
284620	BME462 Microcontrollers And Embedded Systems	Pre./Con.
283140	BME314 Medical Electronics Ii	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction to Arduino Boards	
Week 2	PC Serial Interface & PWM	
Week 3	Reading Digital Signals: Input Switches	
Week 4	Reading Analog signals: Sensors Interface	
Week 5	Liquid Crystal Display (LCD) & Cloud Simulation	
Week 7	Distance Measurement & System Calibration	
Week 8	Biopotentials and Servo Motors	
Week 9	Real-Time Signal Processing	
Week 10	Bluetooth Connection	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understand Arduino board basic features and architecture [1SLO1, 1SLO2, 1SLO4, 1SLO7]	10%	
Development of Arduino language [1SLO1, 1SLO2, 1SLO4, 1SLO7]	10%	
Understand how to control I/O port of microcontroller [1SLO1, 1SLO2, 1SLO4, 1SLO5, 1SLO7]	10%	
Controlling of Liquid Crystal Display [1SLO1, 1SLO2, 1SLO4, 1SLO5, 1SLO7]	10%	

Understand the controlling procedure of distance sensors [1SLO1, 1SLO2, 1SLO4, 1SLO5, 1SLO7]	10%	
System measurement Calibration [1SLO1, 1SLO2, 1SLO4, 1SLO5, 1SLO6, 1SLO7]	10%	
Recording Biopotentials [1SLO1, 1SLO2, 1SLO4, 1SLO5, 1SLO7]	10%	
Demonstrate controlling output device using biopotentials [1SLO1, 1SLO2, 1SLO5, 1SLO7]	10%	
Real-time signal processing and FIR system implementation [1SLO4, 1SLO5, 1SLO7]	10%	
Bluetooth connectivity [1SLO1, 1SLO2, 1SLO4]	10%	

Relationship to Program Student Outcomes (Out of 100%)																			
A	B	C	D	E	F	G	H	I	J	K	L	M	SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	SLO7
													20.5	20.5		21.33	15.5	1.67	20.5

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