**University of Jordan**
**College of Engineering & Technology**
**Department of Electrical Engineering**
2nd – 2023-2024
**Dr. Jamal Rahhal (Rahhal@ju.edu.jo)**

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| **Course:** | Microcontroller Applications Lab– EE-0933239   (1 Cr. – Core Course) |
| **Catalog Data:** | This course is designed to demonstrate the basics of microcontroller Systems with some engineering applications. |
| **Prerequisites by Course:** | Microprocessors Systems and Languages. |

**Prerequisites by topic:**

Students are assumed to have a background of the following topics:
- Microcontroller. (0903233)
- Electronics and Circuits.

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| **Textbook:** | MICROCONTROLLER THEORY AND APPLICATIONS WITH THE PIC18F. Mohamed Rafiquzzaman, Second Edition, Wiley, 2018. |

**References:**
- Make: Basic Arduino Projects, Don Wilcher, 2014.

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| **Schedule & Duration:** | 14 Labs, 3 Hours each (including exams). |
| **Minimum Student Material:** | Text book, class handouts, scientific calculator, and an access to a personal computer. |
| **Minimum College Facilities:** | Lab with Measuring Instruments and Lab Kits. |

**Course Objectives:**

The following basic course objectives are expected to be achieved during the course
- Build engineering common sense and insight in dealing with engineering applications.
- Understand the basic concepts of Microcontrollers.
- Build a comprehensive knowledge about Microcontroller Applications.

**Course Outcomes and Relation to ABET Program Outcomes:**

Students will be expected to develop the following skills/understanding upon the successful completion of this course:
- Understand the main concepts of Microcontrollers.
- Understand the Microcontroller I/O and Interrupts.
- Understand the C programming for Microcontrollers.
- Write C programs for Microcontrollers.

## Course Topics:

| Topic | Description | Contact Hours |
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| T.1. | **Project1:**<br>Fusion WSN using ESP32. | 6 |
| T.2. | **Project2:**<br>Client Server using ESP32. | 6 |
| T.3. | **Project3:**<br>Serial bridge using ESP32. | 6 |
| T.4. | **Project4:**<br>Face Detection and Recognition Using ESP-CAM. | 6 |
| T.5. | **Project5:**<br>Design and Implement 3phase Inverter. | 6 |
| T.6. | **Project 6:**<br>3 axis CNC/Router device, and 3D-printer. | 6 |
| T.7. | Exams, and Reviews. | 3 |

## Grading policy:

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| Course Work and Quizzes | 60 % |
| Final Exam | 40 % |
| Total | 100% |

## Instructor:

| Instructor Name | Office Hours | Ext. | E-mail |
|---|---|---|---|
| **Dr. Jamal Rahhal** | M.W.<br>10:00-11:00 | | *rahhal@ju.edu.jo* |

## Last Updated:   Feb. 25, 2024