

## Faculty of Engineering & Technology

### Microprocessors and Applications

#### Information :

**Course Code :** CMP 351

**Level :** Undergraduate

**Course Hours :** 3.00- Hours

**Department :** Department of Electrical Engineering

#### Instructor Information :

Title	Name	Office hours
Associate Professor	Mohamed Hassan Mohamed Elmahlawy	
Teaching Assistant	Shahd Ahmad Samir Ibrahim	

#### Area Of Study :

- Develop students to understand the concepts of a microprocessor system.
- Develop students to study architectural features of important processors, and memory design.
- Develop students to study and implement different interfacing techniques.
- Train students to write and program a processor.

#### Description :

Introduction to microprocessors, Architecture, Microprocessor hardware, Assembly language fundamentals, Programming, Microprocessor system connections, Timing in microprocessors, Interrupts and interrupt service procedures, Microprocessor timing specifications, Interfacing, Programmable chips, Data acquisition systems, Applications of closed loop control, I/O hardware alternatives, Developments tools, Troubleshooting case studies

#### Course outcomes :

##### **a. Knowledge and Understanding: :**

1 -	Describe the basic microprocessor architecture, the hardware of the microprocessor system connections, and the basic timing of the microprocessor operations at the address, data, and control level.
2 -	Illustrate the programming of the Intel 80x86 based microprocessors using their instructions through teaching of assembly language programming techniques.
3 -	Explain the principles and applications of the memory interface with the popular Intel 8086/8088 based microprocessors using different bus cycles and timing.
4 -	Explain the principles and applications of the input/output interface of the popular microprocessor, based on Intel 8086/8088, and a selected microcontroller.

##### **b. Intellectual Skills: :**

1 -	Design the interface of a memory system, connected to a microprocessor.
2 -	Design an input/output circuit interface, connected to a microprocessor/microcontroller.
3 -	Analyze a microprocessor program and develop an assembly language programs for some applications.

##### **c. Professional and Practical Skills: :**

1 -	Use programmable interface controllers in different interfacing applications.
2 -	Interpret debug tool for microprocessor/microcontroller architecture, software and hardware development.

- 3 - Develop logic analyser for understanding timing hardware development, and for exploring the relationship between hardware and software of a microprocessor system.

**d.General and Transferable Skills :**

- 1 - Collaborate effectively within multidisciplinary team  
2 - Communicate effectively.

**Course Topic And Contents :**

Topic	No. of hours	Lecture	Tutorial / Practical
8086/8808 architecture, microprocessor system connections, and timing (timing and specifications).	10	6	4
Memory interfacing.	15	9	6
Programming through assembly language fundamentals, instruction set, and addressing modes.	10	6	4
Input/output interfacing, programmable controller.	10	6	4
Interrupt procedures.	5	3	2
Data acquisition systems	5	3	2
Applications of microcontrollers as the case study of the RISC processor.	15	9	6
Introduction to microprocessors, architecture, and microprocessor hardware.	5	3	2

**Teaching And Learning Methodologies :**

Lectures

Tutorials

Communication Lab

**Course Assessment :**

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	5.00		to assess the performance of the students through the overall
Attendance/Performance	5.00		to assess the performance of the students through the overall
Electronic and computer Lab Experiments	10.00		to assess the skills of problem solving, understanding of related topics
Final Exam	40.00	15	to assess the comprehensive understanding of the scientific background of the course, to assess the ability of problem solving with different techniques studied.
Midterm 1	15.00	7	to assess the skills of problem solving, understanding of related topics
Midterm 2	15.00	12	to assess the skills of problem solving, understanding of related topics
Quiz 1	5.00	5	to assess the skills of problem solving, understanding of related topics
Quiz 2	5.00	10	to assess the skills of problem solving, understanding of related topics

**Recommended books :**

8808 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware, and Applications (4th Edition),  
Walter A. Triebel and Avtar Singh, ISBN: 0-13-093081-4, Prentice Hall, 2003.