Course Description Form

1. Course Name:
Microprocessor
2. Course Code:
WBM-51-06
3. Semester / Year:
1st Semester / 2024 2025
4. Description Preparation Date:
19/9/2024
5. Available Attendance Forms:
Weekly (Theoretical & Practical)
6. Number of Credit Hours (Total) / Number of Units (Total)
30 Hrs. Theoretical & 30 Hrs. Practical / 3 Units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Hussein Abdalkarem Email: hussein.abd@uowa.edu.iq
8. Course Objectives

Course Objectives	• Understand Microprocessor Architecture: Students should gain comprehensive knowledge of the 8086 microprocessor architecture, including its bus interface, instruction set, and memory organization. • Programming Skills: Develop proficiency in assembly language programming specifically for the 8086 microprocessor. • Interfacing Techniques: Learn how to interface the microprocessor with other electronic components and devices. • Problem Solving: Equip students with the skills to solve practical and theoretical problems using the 8086 microprocessor. • Application to Biomedical Engineering: Understand the application of microprocessors in designing and implementing medical devices and systems.

9. Teaching and Learning Strategies	
Strategy	1. Teaching Methods • Lectures and Demonstrations: Use lectures to cover theoretical aspects and live demonstrations to show practical applications. • Interactive Sessions: Engage students with interactive sessions where they can explore microprocessor components and its functions through virtual simulations. 2. Learning Activities • Hands-On Lab Work: Set up lab sessions where students can work with microprocessor kits and other electronics to build and test simple devices. • Project-Based Learning: Implement projects that involve designing a device or a part of a device using the 8086 microprocessor, encouraging creativity and practical application of learned skills. • Simulation Software: Use software tools to simulate microprocessor functions and circuit designs to enhance understanding without the need for physical components all the time. 3. Continuous Improvement • Feedback Mechanisms: Regularly collect feedback from students to improve the course content and delivery, adapting to changing technological and educational environments. • Professional Development for Instructors: Instructors should continuously update their knowledge and teaching strategies to keep pace with advancements in microprocessor technology and biomedical applications. • Curriculum Updates: Regularly review and update the curriculum incorporate the latest developments in microprocessor technolo and its applications in biomedical engineering.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	4	Introduction to the microprocessor and computer & microprocessor organization	Introduction to the microprocessor	Theoretical & Practical	Daily test and oral questions
2	4	Introduction to the microprocessor and computer & microprocessor organization	Introduction to the microprocessor	Theoretical & Practical	Daily test and oral questions
3	4	Micro-architecture of the 8086 Microprocessor: Introduction to Microarchitecture of the 8086Microprocessor. and Software Model of the 8086 Microprocessor	Architecture of the 8086 Microprocessor	Theoretical & Practical	Daily test and oral questions
4	4	Micro-architecture of the 8086 Microprocessor: Introduction to Microarchitecture of the 8086Microprocessor. and Software Model of the 8086 Microprocessor	Architecture of the 8086 Microprocessor	Theoretical & Practical	Daily test and oral questions
5	4	microprocessors architecture and its operations CPU machine and assembly language Addressing Modes: Register, immediate, direct, register indirect, based-plus-index, register relative, and base relative plus- index addressing	The operations of CPU machine and assembly language Addressing Mod	Theoretical & Practical	Daily test and oral questions
6	4	microprocessors architecture and its operations CPU machine and assembly language Addressing Modes: Register, immediate, direct, register indirect,	The operations of CPU machine and assembly language Addressing Mod	Theoretical & Practical	Daily test and oral questions

		based-plus-index, register relative, and base relative plus- index addressing			
7	4	microprocessors architecture and its operations CPU machine and assembly language Addressing Modes: Register, immediate, direct, register indirect, based-plus-index, register relative, and base relative plus- index addressing	The operations of CPU machine and assembly language Addressing Mod	Theoretical & Practical	Daily test and oral questions
8	4	Instruction Set and Programming: Data Movement Instructions	Instruction Set and Programming: Data Movement Instructions (part 1)	Theoretical & Practical	Daily test and oral questions
9	4	Instruction Set and Programming: Data Movement Instructions	Instruction Set and Programming: Data Movement Instructions (part 2)	Theoretical & Practical	Daily test and oral questions
10	4	string Instructions	string Instructions	Theoretical & Practical	Daily test and oral questions
11	4	Arithmetic Instructions	Arithmetic Instructions	Theoretical & Practical	Daily test and oral questions
12	4	Arithmetic Instructions	Arithmetic Instructions	Theoretical & Practical	Daily test and oral questions
13	4	Logic Instructions	Logic Instructions	Theoretical & Practical	Daily test and oral questions
14	4	Program control Instructions	Program control Instructions	Theoretical & Practical	Daily test and oral questions
15	4	Subroutine and loop & shift and rotate	Subroutine and loop & shift and rotate	Theoretical & Practical	Daily test and oral questions

11. Course Evaluation

- Continuous Assessment: Employ quizzes and small tests focused on microprocessor architecture and programming throughout the course to ensure ongoing learning.
- Practical Exams: Include practical exams where students must demonstrate their ability to program and troubleshoot the 8086 microprocessor.
- Final Project: Evaluate students through a capstone project that involves designing a biomedical device using the 8086, assessing both technical skills and innovative application.

12. Learning and Teaching Resources

Required textbooks (curricular books any)	1- Barry B. Brey, "The Intel Microprocessors 8086/8088, 80186/80188, 80286,80386, 80486, Pentium, and Pentium Pro Processor Architecture, Programming, and Interfacing", 6th Edition, Prentic-Hall Inc., 2003.
Main references (sources)	Walter A. Triebe, "The 8086 Microprocessor: Architecture, Software, and Interfacing Techniques", Prentic-Hall Inc., 1998.
Recommended books and references (scientific journals, reports…)	Walter A. Triebe, "The 8086 Microprocessor: Architecture, Software, and Interfacing Techniques", Prentic-Hall Inc., 1998.
Electronic References, Websites	www.sciencedirect.com