|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Hashemite University**  **College of Engineering**  **Department of Computer Engineering**  **Microprocessor based Systems**  **(3 Credit Hours/Dept.**  **Compulsory )** | | | | | | | | | |  |
| **Instructor** | | | |  | **Grading info** | | |  | **Class Info** | | |
| Dr. Eslam Malkawi | |  | |  | Midterm Exam | | 40% |  | Days | Sec: Sun/Tue/Thurs | |
| Email: | | eslam.malkawi@hu.edu.jo | |  | Project | | 20% |  | Time  Sec: 09:00-10:00 AM | | |
|  | Final Exam | | 40% |  | Location  Online-MT | | |
| Office: | | E-3060 | |  |  |
| Office hours: | | During lecture time  Any time on Microsoft Teams | |  |  | |  |  |  |  | |
| **Course** | | | | | | | | | | | |
| Course Number: | | 110408530 | | | | | | | | | |
| Prerequisite: | | Assembly Language & Microprocessor Systems (110408332) | | | | | | | | | |
| Textbook: | | **"The 8088 and 8086 Microprocessors Programming, Interfacing, Software, Hardware, and Applications",** W.A. Teriebel, A. Singh, 4th edition, 2003. | | | | | | | | | |
| Course Description: | | The objective of this course is to give an introduction to computer architecture using the 8088/86 microprocessors. The course covers the fundamentals of the architecture of a microcomputer, software model of 8088/86 Microprocessor, the hardware architecture of 8088/86 microcomputer system, memory interface, Input/output interface circuits for 8088/86-based microcomputer, interrupt interface of the 8088/86 microprocessor, hardware of the original/IBM PC microcomputer, real-time software and hardware architecture of the 80/86 microprocessor, interfacing to the external devices. | | | | | | | | | |
| Specific Outcomes of Instruction (Course Learning Outcomes) | | 1. **Explore** architecture of an 80x86 microprocessor and the Pentium processor families. (a) 2. **Review** of the assembly language programming related to memory and Input/Output interface. (a) 3. **Understand** the 8088/86 microprocessor hardware, signals, registers, bus cycles, and operation modes. (a, e) 4. **Design** memory system circuits using existing RAM/ROM devices to meet the different requirements. (c, e) 5. **Evaluate** the different types of Input/Output interface circuits/ICs, and Design applications for Input/Output operations. (a, c, e) 6. **Analyze** the techniques used to handle the different type of interrupts, and Design interrupt interface circuits using programmable ICs. (c, e) | | | | | | | | | |
| Important material | | * Lecture notes * Text book and references * Internet resources | | | | | | | | | |
| **References:** | | | | | | | | | | | |
| * Uffenbeck, J., 2002**, 80x86 Family: Design, Programming and Interfacing,** Prentice Hall. | | | | | | | | | | | |
| **Major Topics Covered and Schedule in Weeks:** | | | | | | | | | | | |
| **Topic** | | | **# Weeks** | | | **# Contact hours\*** | | | | | |
| Policies & Introduction: Introduction and overview of 8088/86 microprocessor model. | | | 1 | | | 3 | | | | | |
| Review of Assembly Language programming: instruction set, addressing modes, integer instructions and computations. | | | 1 | | | 3 | | | | | |
| The 8088 and 8086 Microprocessors: Signals, bus cycles, operation modes, memory architecture and their I/O operations. | | | 3 | | | 9 | | | | | |
| Memory devices and memory circuits and subsystem design. | | | 3 | | | 9 | | | | | |
| External Input/Output interface circuits: 64-line parallel Input/Output, handshaking parallel printer, programmable peripheral interface. | | | 3 | | | 9 | | | | | |
| Interrupt interface: System and user-defined interrupts, interrupt instructions, interrupt interface circuits, and programmable interrupt controller. | | | 3 | | | 9 | | | | | |
| Total | | | **14** | | | **42** | | | | | |
| **Course Policy** | | | | | | | | | | | |
| * The course will follow selected subjects as listed on the course schedule. Additional lecture notes and examples will be given and discussed in class as much as time permits. * Students are responsible for the reading assignments from the text and handouts * Students are responsible for following up the lecture materials * Students are responsible for reading additional information and examples in order to understand the materials discussed in the lectures. * If you miss class, there won’t be a makeup test, quiz, etc. and you will get a zero unless you have a valid excuse. * Cheating and plagiarism are completely prohibited. * If you miss more than 15% of classes you will automatically fail the class. | | | | | | | | | | | |

|  |  |  |
| --- | --- | --- |
| **Student Outcomes (SO) Addressed by the Course:** | | |
| ***#*** | ***Outcome Description*** | ***Contribution*** |
| ***General Engineering Student Outcomes*** | | |
| (a) | An ability to apply knowledge of mathematics, science, and engineering | ***H*** |
| (b) | An ability to design and conduct experiments, as well as to analyze and interpret data |  |
| (c) | An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability | ***H*** |
| (d) | An ability to function on multidisciplinary teams |  |
| (e) | An ability to identify, formulate, and solve engineering problems | ***H*** |
| (f) | An understanding of professional and ethical responsibility |  |
| (g) | An ability to communicate effectively |  |
| (h) | The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context |  |
| (i) | a recognition of the need for, and an ability to engage in life-long learning |  |
| (j) | A knowledge of contemporary issues |  |
| (k) | An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice |  |
| **H**=High, **M**= Medium, **L**=Low | | |

**Prepared By: Dr. Eslam Malkawi**