American University of Sharjah | College of Engineering

- 1. Course number and name COE 251 – Introduction to Computer Systems
- 2. Credits and contact hours 4 credit hours, 3 contact hours and 3 lab hours per week
- **3. Prerequisites or co-requisites** <u>Prerequisites</u>: CMP 120 (Programming I) or MCE226L and COE 221.
- **4. Name and Contact Information of Instructor** Dr. Hicham H. Hallal

5. Course Description (Catalog Description)

Examines hardware and software model of microprocessors, programming of microprocessors, memory systems, memory interface and memory access (DMA), input/output programming and interface, and design of microprocessors-based systems.

6. Textbook, title, author, and year

Randal E. Bryant and David R. O'Hallaron, Computer Systems: A programmer's Perspective. Second and Third Edition are acceptable. Prentice Hall.

or

Barry B. Brey, The Intel Microprocessors: 8086/8088, 80186, 80286, 80386, 80486, Pentium, Pentium Pro, Pentium II, Pentium II, Pentium 4, Eight Edition, 2009, PrenticeHall.

Supplemental material

Handouts and Lecture notes through iLearn.

7. Specific goals for the course

Upon completing the course, student will be able to:

- 1. Explain the operation of a microprocessor Bus Interface Unit (BIU) and Execution Unit (EU) and use the instruction sets
- 2. Explain and utilize the memory and input/output addressing modes.
- 3. Write assembly programs according to the design specifications.
- 4. Include subroutines within a program.
- 5. Understand the multiplexing concepts of address, data and control busses.
- 6. Analyze the timing sequence of events on the address, data and control bus.
- 7. Write assembly programs to interface 8086 with peripherals such as printer, fax, keyboard and others

8. Teaching and Learning Methodologies

Methods include lectures, labs, homework assignments, quizzes, exams and class discussions

9. <u>Course Topics and Schedule:</u>

Торіс	Weeks
Architecture & software model of 8088/8086 microprocessor	1
Memory, address space, data organizations & data types	1

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Registers, memory addresses, and addressing modes	1
Instruction set architecture and assembly language of 8086 microprocessor	2
Data transfer and arithmetic instructions, Logic, Shift and Rotate instructions	2
Flag-control instructions and compare instructions	1
Control, Flow and the Jump Instructions	1
Subroutine and Subroutine- Handling Instructions	2
Microprocessors – memory and I/O interfaces	2
Address, data and control buses (timing, decoding and multiplexing)	1
Input /Output interface and programmable peripheral interface	1
Review and Assessment	1
Total	16