University of Scholars
Department of Computer Science and Engineering

Course Title:	**Microprocessor & Assembly Language**
Course Code:	**CSE 3253-0714**
Credit/Hours:	**3hrs/Week**
Prerequisites:	N/A
Course Instructor:	**Md. Nurul Islam**
Email:	**nisakib@ius.edu.bd**
Course Description	Introduction to microcomputer architecture, 16-bit, and 32-bit microprocessors: architecture, addressing modes, instruction set, interrupts, multitasking and virtual memory, paging; multicore processor, cache memory, interfacing: programmable peripheral interface, direct memory access, keyboard and display interface, memory chips (i.e. ROM, RAM), Clock generator, Bus Arbiter; Microcontroller: Introduction to micro- controllers (i.e. ATMega32), Digital and analog signals and conversions, Interfacing switches, LEDs, sensors and motors, serial communication protocols (i.e. SPI, I2C, CANBUS) in embedded systems.
Course Objectives:	Describe microprocessor architecture and its functionalities. Illustrate microprocessor interfacing with memory devices and external peripherals. Discuss operating mode of microprocessors memory management techniques. Explain SAP (simple as possible) computer architecture. Identify the difference between microprocessor and micro-controller, use analog to digital conversion (ADC) and digital to analog conversion (DAC) using micro-controller and apply different communication protocol for interfacing.
Course Outcome:	At the End of the course students will be: • CLO1: Learn the fundamentals of Microprocessor based computer systems. • CLO2: Competent to identify a detailed hardware structure of Microprocessor.

- CLO3: Competent to analyze the logical operation of microprocessors and realize the Engineering problems which are solved by the usage of microprocessors.

CLO & PLO Mapping:

CLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11
CLO1	✓										
CLO2	✓			✓							
CLO3		✓	✓	✓							✓

Grading policy:

Assessment Strategy	Marks
Class attendance	10
Assignment/ Presentation	10
Class test/quiz	10
Midterm exam	30
Final exam	40
Total	**100**

Unit No.	Week	Lecture	Topic Name	Mode of Teaching
1. Introduction to microprocessor	1	1	Basic concept of microprocessor	ppt/video/notes
		2	Microcomputer structure	ppt/video/notes
2. Microprocessor based microcomputer	2	3	Introduction to microcomputer, microcomputer vs microprocessor	ppt/video/notes
		4	Major components of microprocessor, basic operation of microcomputer.	ppt/video/notes
3. Features of Microprocessor	3	5	Microprocessors of Intel Family, Microprocessor Basic Features, Pin Diagram of Various Microprocessors	ppt/video/notes
4. Input/Output:		6	Introduction to I/O devices	ppt/video/notes
	4	7	**Class test - 1 and Assignment - 1 for Unit 1,2**	
		8	I/O ports	ppt/video/notes
	5	9	Programmed I/O, Standard I/O	ppt/video/notes
		10	Memory driven I/O, Direct Memory Access	ppt/video/notes
5. 8086 Introduction	6	11	8086 Introduction, Functional Blocks	ppt/video/notes
		12	8086 Pin Diagram, 8086 Internal Basic Architecture, 8086 Detailed Architecture (BIU, EU)	ppt/video/notes
6. Memory Management Techniques:	7	13	Memory Segmentation	ppt/video/notes
		14	Fragmentation, Differences Between Internal and External Fragmentation.	ppt/video/notes
Review and Class Test	8	15	**Review Class for Unit 3**	ppt/video/notes
		16	**Class test - 2 and Assignment - 2 for Unit 3**	
Mid Semester Examination (Tentative)				

		17	Basic interrupt, Hardware Interrupt,	ppt/video/notes
7. 8086 Interrupt	9	18	Interrupt Vector Table, Interrupt Vector	ppt/video/notes
5. Analog Digital	10	19	Analog to Digital, Digital to Analog Convention,	ppt/video/notes
		20	Analog and Digital Sensors, Pulse Code Modulation	ppt/video/notes
9. 8086 Interfacing	11	21	8086 & Memory Interfacing, Memory Organization, RAM Operation,	ppt/video/notes
		22	DRAM, SRAM, Memory Decoding, Address Mapping	ppt/video/notes
10. 8086 Bus timing	12	23	General BUS Operation, Machine Cycles	ppt/video/notes
		24	Ready Pin and Wait States	ppt/video/notes
11. 8086 Pipelining	13	25	Trivia, Pipeline Introduction	ppt/video/notes
		26	**Class test - 3 and Assignment - 3 for Unit 4,5 and 6**	ppt/video/notes
12. SAP -1	14	27	SAP-1 Architecture,	ppt/video/notes
		28	SAP-1 Exercise, SAP Routines	ppt/video/notes
13. Communication Protocol	15	29	Serial Communication	ppt/video/notes
		30	Parallel Communication, Terminology, Advantages and Disadvantages.	ppt/video/notes
9. Protected Mode	16	31	Limitation of Real Mode operation, Importance of Memory Management Unit	ppt/video/notes
		32	Virtual Memory Management by MMU.	ppt/video/notes
Semester Final Examination				

References:		
Learning Materials		
SL No.	**Text Books**	**Others Learning Materials**
1	Md. Rafiquzzaman, Microprocessor and Microcomputer Based System Design, Published by CRC Press, 2nd Edition.	Journals, Web Materials, etc.
2	Douglas Hall, Microprocessors and Interfacing Programming and Hardware, Published by McGraw Hill, 3rd Edition.	
3	Robert L. Hummel, PC Magazine Programmer's Technical Reference: The Processor and Coprocessor, Published by Ziff-Davis Press, Illustrated Edition.	