BANGLADESH ARMY INTERNATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY (BAIUST), CUMILLA

বাংলাদেশ আর্মি ইন্টারন্যাশনাল ইউনিভার্সিটি অব সায়েন্স এন্ড টেকনোলজি, কুমিল্লা

COURSE OUTLINE

Semester: 1/2024 (Fall)
Course Title: Microprocessor, Assembly Language & Computer Interfacing Sessional
Course Code: CSE 326

1. BASIC INFORMATION

Faculty	Syed Shakil Mahmud						
Office Hours	**Day**	**Time**			**Room No.**		
	Sunday	11:35 AM - 02:30 PM			408		
Counseling Hour	Sunday	02:35 PM – 04:00 PM			Office		
Contact Details	Office:	CSE Faculty Room, 3rd Floor, Academic Block					
	Email:	shakil.cse@baiust.ac.bd					
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Pre-requisites	CSE-223						
Offering Dept.	CSE						
Course Title	Microprocessor, Assembly Language & Computer Interfacing Sessional						
Course Code	CSE-326	**Credit**	1.5		**Contact Minutes**	1680	
Number of Lectures + Practical Sessions	10	**Quiz & Viva**	02	**Lab Test (Mid & Final)**	2	**Total**	14

2. RATIONALE

This course introduces basics of assembly language, microprocessor architecture, and discusses different interfaces and the design of systems based on microprocessors and microcontrollers.

3. OBJECTIVE

1. To achieve knowledge on the low level language of microprocessor.

2. To provide an understanding of microprocessor-based systems and their use in instrumentation, control and communication systems.

3. To Investigate microprocessor-based systems, produce software for a microprocessor-based system, interface microprocessor-based systems and understand usage of programmable logic controllers.\

4. COURSE CONTENT

Basic of Assembly Language - Compilation, input, output, variables, basic instructions, memory model, data segment, stack segment, code segment, Input Output Instruction;

Flow Control Instruction - Conditional and unconditional jump instructions, If-then-else, case, for loop, while loop, repeat loop;

Logic, Shift and Rotate Instructions - AND, OR, XOR, complement, shift left, shift right, rotate left, rotate right, rotate carry left, rotate carry right, Binary , Hexa Input Output**;**

Stack and Procedure - Push, Pushf, Pop, Popf;

Multiplication 198 and Division – Mul, IMul, Div, IDiv**;**

Array and Addressing moods – 1D Array, DUP operator, Addressing mood, register indirect mood.

String Instructions - Moving string, load string, scan string, compare string;

File Operations – File errors, opening and closing a file, reading a file, writing a file.

Basic **Idea of MDA 8086**; LED, Seven Segment display, LCD, Keyboard, Motor, Dot matrix Interface with 8086; Basic idea of ATMEGA 16 microcontroller and simulation.

5. COURSE OUTCOMES (CO) & GENERIC SKILLS

No.	Course Outcome (Upon completion of the course, the students will be able to)	Bloom's Taxonomy	CP	CA	KP	Assessment Methods
CO1	Describe how the high level language is converted to low level languages and how a processor executes a program line by line and solve problems using low level languages.	C1-C3		1	1,8	E, L
CO2	Work with basic microprocessors using assembly language and define where used.	C3, C4, C6		2	1,5	E, Q/V, L
CO3	Work on Group Project based on basic micro-controllers with presentation.	C3, C6	3	4	5,6	PR, R
CO4	Interpret how a basic microcomputer works with its associated components.	C1, C2, C4		1	1,6	E, L, Q/V
CO5	Experiment with a basic microprocessor using assembly language in a group project.	C2-C4, C6, A4		1,3	5	PR, R
(CP- Complex Problems, CA-Complex Activities, KP-Knowledge Profile, E – Evaluation; L – Lab Test; PR – Project; Q – Quiz; ASG – Assignment; Pr – Presentation; R - Report; V - Viva; F – Final Exam; MT – Mid Term)						

6. SKILL MAPPING

No.	Course Learning Outcome	PROGRAM OUTCOMES (PO) (H – High, M- Medium, L-low)											
		1	2	3	4	5	6	7	8	9	10	11	12
CO1	Describe how the high level language is converted to low level languages and how a processor executes a program line by line and solve problems using low level languages.	M		M									
CO2	Work with basic microprocessors using assembly language and define where used.			H	M								
CO3	Work on Group Project based on basic micro-controllers with presentation.	M			H					H			
CO4	Interpret how a basic microcomputer works with its associated components.	H				M							
CO5	Experiment with a basic microprocessor using assembly language in a group project.	M		H						H			

7. JUSTIFICATION FOR CO-PO MAPPING:

Mapping	Level	Justifications
CO1 – PO1	Medium	Will be able to gain depth of knowledge on how a low-level language is implemented and its execution line by line by a processor.
CO1 – PO4	Medium	Medium Will be able to investigate and experiment with low-level languages by writing programs.
CO2 – PO2	High	Will be able to do complex analysis of assembly programs and define where used.
CO2 – PO3	Medium	Will be able to design solutions to a variety of problems using assembly language.
CO4 – PO1	Medium	Will develop breadth and depth of knowledge while experimenting with a basic microprocessor using assembly language in a group project.
CO4 – PO3	High	Will be able to develop innovative solutions while working in a microprocessor-based group project.
CO4 – PO9	High	Will gain experience of team work and collaboration while working in the group project.
CO3 -PO1	High	High Will gain breadth and depth of knowledge in illustrating how a basic microcomputer works with its associate components.
CO3 – PO5	Medium	Will be able to gain a level of understanding of the appropriateness of microprocessors and associated devices.

8. TEACHING LEARNING STRATEGY

Teaching and Learning Activities	Engagement (hours)
Face-to-Face Learning	
Lecture	7
Practical / Tutorial / Studio	42
Student-Centered Learning	-
Self-Directed Learning	
Non-face-to-face	-
learning Revision	-
Assessment Preparations	14
Formal Assessment	
Quiz	1
Viva	1
Continuous Assessments	8
Midterm Lab Test	1
Final term Lab Test	1
Total	75

6. LECTURE OUTLINE

Class	Topics/Assignment	COs	Reading Reference

1	**Basic of Assembly Language** - Compilation, input, output, variables, basic instructions, memory model, data segment, stack segment, code segment, Input Output Instruction	1	1
2	**Flow Control Instruction** - Conditional and unconditional jump instructions, If-then-else, case, for loop, while loop, repeat loop	1	1
3	**Logic, Shift and Rotate Instructions** - AND, OR, XOR, complement, shift left, shift right, rotate left, rotate right, rotate carry left, rotate carry right, Binary , Hexa Input Output	1	1
4	**Stack and Procedure -** Push, Pushf, Pop, **Popf Multiplication and Division** – Mul, IMul, Div, IDiv	1	1
5	**Array and Addressing moods** – 1D Array, DUP operator, Addressing mood, register indirect mood	1	1
6	**String Instructions** - Moving string, load string, scan string, compare string **File Operations –** File errors, opening and closing a file, reading a file, writing a file	1	3
7	**Lab Test-1**	1	1
8	Project Idea	1	1
9	Basic Idea of MDA 8086 LED and Seven Segment display interface		2
10	Operation of DOT matrix using 8086 kit LCD interface with 8086		2
11	Keyboard interface with 8086 Motor interface with 8086	1	1
12	Project Update	1	1
13	**Lab Test-2**	1	1
14	Final Project Submission Quiz	1	1

10. READING REFERENCE

1. Assembly Language Programming and Organization of the IBM PC--Ytha Yu, Charles Marut
2. The Intel Microprocessors - Barry B Brey
3. Microprocessors and Interfacing - Douglas V. Hall

11. ASSESSMENT STRATEGY

Components	Grading	CO	Blooms Taxonomy
Quiz (Midterm & Final)	10%		
Lab Test	20%		
Viva (Midterm + Final Exam)	10%		
Continuous Evaluation	30%		
Midterm & Final Exam	30%		
(CO = Course Outcome, C = Cognitive Domain, P = Psychomotor Domain, A = Affective Domain)			