Course Name: CS-234,**Computer Organization & Assembly Language**

Credit Hours: 2-1

Contact Hours: 2-3

Pre-requisites: Digital Logic Design

Course Introduction:

In this course, students will develop a comprehensive understanding of modern computer systems, encompassing processors, memory, input/output devices, and storage media. They will further grasp the concept of interrupts and gain the ability to design and implement interrupt service routines. As they progress, students will apply their knowledge to write programs in assembly language, covering a wide range of operations, including arithmetic, logical operations, branching, looping constructs, and input/output operations. Additionally, they will delve into the intricacies of addressing modes, enabling them to analyze and create programs that utilize different addressing modes with precision and skill.

CLO No	Course Learning Outcomes	Bloom Taxonomy
CLO-1	Understand the organization and operation of modern computer systems, including processors, memory, input/output devices, and storage media.	C2 (Understand)
CLO-2	Understand the concept of interrupts, and be able to design and implement interrupt service routines.	C2 (Understand)
CLO-3	Apply and write programs in assembly language, including arithmetic and logical operations, branching and looping constructs, and input/output operations.	C3 (Apply)
CLO-4	Understand the concept of addressing modes, and be able to analyze and write programs that use different addressing modes.	C4 (Analyze)

Course Plan:

#	Weekly Distribution of Course Contents
Week-1	Introduction to Computer Organization
Week-2	Instruction Set Architecture and Basic machine instructions
Week-3	Addressing modes, Assembly language syntax and structure
Week-4	Data definition directives, Arithmetic and logical operations
Week-5	Direct addressing mode and Indirect addressing mode

Week-6	Indexed addressing mode
Week-7	Base-plus-offset addressing mode
Week-8	Introduction to interrupts, Interrupt handling in assembly language
Week-9	Interrupt vector table, Memory hierarchy
Week-10	Cache memory organization, Cache coherence and consistency
Week-11	Virtual memory
Week-12	Input/output operations in computer systems
Week-13	Direct memory access (DMA),
Week-14	Basic concepts of processor design
Week-15	Computer Arithmetic, Basic concepts of computer security
Week-16	Buffer overflow attacks and countermeasures, Software security

Reference Materials:

1. "Computer Organization and Architecture: Designing for Performance" by William Stallings (11th edition, 2020)

2. "Computer Organization and Design: The Hardware/Software Interface" by David A. Patterson and John L. Hennessy (5th edition, 2014)

3. "Computer Systems: A Programmer's Perspective" by Randal E. Bryant and David R. O'Hallaron (3rd edition, 2016)