Course Title	**Computer Organization and Assembly Language Lab**		
Course Code	**CC-210L**		
Credit Hours	1 (0,3)		
Category	Computing core		
Prerequisite	CC-110 Digital Logic Design		
Co-Requisite	None		
Follow-up	None		
Course Introduction	The main objective of this course is to introduce the organization of computer systems and usage of assembly language for optimization and control. Emphasis should be given to expose the low-level logic employed for problem solving while using assembly language as a tool. At the end of the course the students should be capable of writing moderately complex assembly language subroutines and interfacing them to any high-level language.		
Course Learning Outcomes (CLOs)	At the end of the course, the students will be able to:	**BT**	**PLO**
	CLO1: Acquire the basic knowledge of computer organization computer architecture and assembly language	C1 (Acquire)	1
	CLO2: Understand the concepts of basic computer organization, architecture, and assembly language techniques	C2 (Understand)	2
	CLO3: Solve the problems related to computer organization and assembly language	C3 (Apply)	3,4,5
Syllabus	**Topics:** Assembly Language Syntax, using the gdb debugger, Program data, Variables, Variables, Program Structure, Machine-level representation of programs: a historical perspective, program encodings, data formats, accessing information, arithmetic and logical operations, control, Memory Models, Data Segments, Stack Segment, Code Segment, Variants of MOV instruction, Some Basic Instructions, XCHG,ADD, SUB, INC, DEC,NEG, Input and Output Instructions, The Processor Status and Flags Register, Flow Control Instructions, Unconditional Jump, Various Conditional Jumps, Looping Structures, Logic Instructions, AND, OR,XOR, NOT, TEST, Shift Instructions, Rotate Instructions, Procedures to Input Binary, Decimal, Hexadecimal Numbers, Procedures to output Binary, Decimal, Hexadecimal Numbers, The Stack, PUSH and POP Instructions, CALL and RET instructions, MUL instruction, DIV instruction, Related Programming examples, XLAT instruction, String Instructions, MOVSB/W, LOADSB/W, STOSSB/W, SCASB/W, CMPSB/W , Procedures, File Operations, Reading a File, Writing a File		
Suggested Instructional/ Reading Material	1. Charles Marut, Ytha Yu, Assembly Language Programming and Organization of the IBM PC, 1st Edition, McGraw-Hill, 1992, ISBN: 9780070726925. 2. M. Morris Mano, Computer System Architecture, 3rd Edition, Pearson, 1993, ISBN: 9780131755635. 3. Barry B. Brey, The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium and Pentium Pro-Processor, Pentium II, Pentium III, Pentium 4", 7th Edition, Prentice Hall, 2005, ISBN: 0131195069. 4. Kip R. Irvine, Assembly Language for Intel Based Computers, 4th Edition, Prentice Hall, 2002, ISBN: 9780130910134.		