By Course outcome	Topics ASSEMBLY LANGUAGE PROGRAMMING	Tach Hrs.	Marks
Learning outcome1	Introduction to Microcontroller 8051	15	10
Contacts	History in microcontroller 8051, Architecture microcontroller 8051, Features of microcontroller 8051, Pin diagram 8051, Application in microcontroller 8051 architecture, Difference between microprocessor and microcontroller. Explain the Embedded microcontroller.		
	External		
Practical	1.Stepper motor control. 2. Frequency generator with timer 3.DC motor speed regulation with a feedback system.		
Learning outcome1.1	Study of Intel family Microprocessor 8086 and Microcontroller 8051		10
	Internal work		

Learning outcome 2	Introduction to assembly programming language	10	10
Contacts	Introduction in assembly language, advantage of alp. Terminology in macro assembly, cross assembly, High level assembly, Meta assembly, Inline assembly or Embedded assembly. Explain in assembler. difference between assembly language and assembler. Classification between assembly language, Machine language ,High level language. Explain ASCII ,BCD, Hexadecimal number system using alp.		
	External work		
Learning outcome 2.1	1. Basic implementation in BCD . 2. Basic implementation in ASCII code.		10
	Internal work		
Learning outcome 3	Address mode in register	15.	10
Contact	**Introduction in** using alp registers with different sizes 8bit ,16 bits 32bit.		

	General purpose AX,BX,CX,DX ,Pointer registers IP,SP,BP Index registers SI,DI ,flage register .Explain in assembly language using Mnemonics . Assembly language programming Syntex . Register address mode, Immediate address mode ,Direct address mode, Indirect address mode.		
	external		
Practical	1. Unsigned arithmetic routines (8bits,16bits) simple program. Addition & Subtraction Multiplication & Division 2. Two's complement conversation routines. 3. Write the program move data one register to other register.		
Learning outcome 3.1	1. Study of flage register. 2. Study of mnemonic table using assembly language.		10
	Internal work		
Learning outcome 4	Instruction set	15.	15

Contact	Data transfer instruction MOV instruction, Ambiguous move (exchanges)XCHG,(translate)XLAT. Increment (INC) & decrement (DEC) INSTRUCTION Directives – EQU, %assign and % define (constant). Conditional Execution Conditional Jump, Unconditional Jump. Call & Ret instruction. Logical Instruction AND,OR,XOR,NOT.		
	external		
Practical	1.Write the program in move instruction. 2. Implementing simple Boolean function 1.Combinational logic. 2. Sequential logic. 3.write the program in increment and decrement.		
Learning outcome 4.1	1. Study of assembly language directives. 2. Call and return value.		10
	Internal work		
Learning outcome 5	Assembly language program		
Contact	Simple program in assembly language addition with and without carry . subtraction with	20.	15

	and without borrow multiplication and division. Unsigned and Signed number. Shift instruction Shift left (SHL) and Shift Right (SHR). Rotation instruction without carry (ROL,ROR), Through carry (RCR,RCL). Looping instruction with using array.		
	External		

Practical	1. Signed arithmetic routines(8bits,16bits).
	        Addition & Subtraction
	        Multiplication & Division
	
	4. Write the program in addition with carry.
	5. Write the program in subtraction with borrow.		

Learning outcome 6	Assembly language with C language	15	10
Contact	Macro definition , Pre-processor , Directives and Conditional assembly . Inline assembly using ASM{}		

	C with assembly language programming. Input/Output operating.		
	External		
Practical	1. Write the program in macro. 2. Mixed c with assembly language program with help asm{}.		
Learning outcome 6.1	1. Study of "macro". 2. Inline assembly.		10
	Internal work		