MICROPROCESSORS AND MICROCONTROLERS LABORATORY

VI Semester: ECE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AEC108	Core	-	-	3	2	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 45				Total Classes: 45		

OBJECTIVES:

The course should enable the students to:

I. Understand the assembly level programming.

II. Identify the assembly level programming in given problem.

III. Compare different implementations and designing with interfacing circuits.

IV. Understand the basic programming knowledge on processor and controller.

V. Understand and develop assembly language programming with various applications.

VI. Understand the applications of Microprocessors and Microcontrollers

COURSE OUTCOMES (COs):

CO1 : Familiarize with the assembly level programming

CO2 : Design circuits for various applications using microcontrollers

CO3 : An in-depth knowledge of applying the concepts on real- time applications

CO4 : Design and apply interfacing circuits for different applications

CO5 : Understand the basic concepts of 8051 microcontroller with their application

COURSE LEARNING OUTCOMES (CLOs):

The students should enable to:

1. Design and develop an Assembly language program using 8086 microprocessor.
2. Understand the 16 Bit arithmetic and logical operations using WIN862 software.
3. Understand the program to perform multi byte addition, subtraction and3*3 matrix multiplications.
4. Understand the to perform ascending and descending order using 8086
5. Understand the programming concepts on strings
6. Understand the programming for Code converters.
7. Design and interacting stepper motor to 8086.
8. Analyze and interfacing to convert analog to digital.
9. Design and interface Matrix keyboard to 8086.
10. Interface tone generator using 8086Design and interface keyboard to 8051.
11. Interface traffic light controller to 8086
12. Understand the basic programs using 8051
13. Understand the program to verify timer/counter using 8051
14. Design and interface keyboard to 8051.

LIST OF EXPERIMENTS	
Week-1	**DESIGN APROGRAM USING WIN862**
Design and develop an Assembly language program using 8086 microprocessor and to show the following aspects. a. Programming b. Execution c. Debugging To Demonstrate the Tool Chain for MASM and Hardware for 8086 Microprocessor.	
Week-2	**16 BITARITHMETIC AND LOGICAL OPERATIONS**
Write an ALP program to perform 16 Bit arithmetic and logical operations using WIN862 software.	
Week-3	**MULTIBYTE ADDITION AND SUBRACTION**
a. Write an ALP program to perform multi byte addition and subtraction. b. Write an ALP program to perform 3*3 matrix multiplication and addition.	
Week-4	**PROGRAMS TO SORT NUMBERS**
a. Write an ALP program to perform ascending order using 8086. b. Write an ALP program to perform descending order using 8086.	
Week-5	**PROGRAMS FOR STRING MANIPULATIONS OPERATIONS**
a. write an ALP program to insert or delete a byte in the given string. b. Write an ALP program to search a number/character in a given string. c. Write an ALP program to move a block of data from one memory location to the other & Write an ALP program for reverse of a given string.	
Week-6	**CODE CONVERSIONS**
a. Write an ALP program to convert packed BCD to Unpacked BCD b. Write an ALP program to convert packed BCD to ASCII c. Write an ALP program to convert hexadecimal to ASCII	
Week-7	**INTERFACING STEPPER MOTOR**
a. Write an ALP program to rotate stepper motor in clockwise direction. b. Write an ALP program to rotate stepper motor in anti clockwise direction.	
Week-8	**INTERFACING ADC & DAC DEVICES**
a. Write an ALP program to convert analog to digital using 8086. b. Write an ALP program to convert digital to analog using 8086.	
Week-9	**INTERFACING TRAFFIC LIGHT CONTROLLER AND TONE GENERATOR**
a. Write an generator ALP program to interface traffic light controller b. Write an ALP program to interface tone	
Week-10	**INTERFACING KEYBOARD**
Write an ALP program to perform 16 Bit arithmetic and logical operations by using 8051 microcontroller.	

WeeK-11	SERIAL AND PARALLEL COMMUNICATION
Write an ALP program and verify timer/counter using 8051	
Week-12	**INTERFACING ELEVATOR**
Write an ALP program to interface keyboard to 8051	

Text Books:

1. D. V. Hall, "Microprocessors and Interfacing", Tata McGraw-Hill Education, 3rdEdition 2013.
2. A. K Ray, K. M. Bhurchandani, "Advanced Microprocessors and Peripherals", Tata McGraw-Hill Education, 2ndEdition 2006.

Reference Books:

1. N. Senthil Kumar, M. Saravanan, S. Jeevanathan, S. K. Shah,"Microprocessors and Interfacing", Oxford University, 1st Edition, 2012.
2. Lyla B. Das, "The x86Microprocessors", Pearson India, 2nd Edition, 2014
3. DanielTabak, "Advanced Microprocessors", Addison-Wesley, 2nd Edition, 1996.
4. Triebel, Singh, "The 8088 and 8086 Microprocessors", PHI, 4th Edition 2003.