

MICROPROCESSORS AND MICROCONTROLLERS LAB

Course Code	19EC3651	Year	III	Semester	II
Course Category	Program Core	Branch	ECE	Course Type	Lab
Credits	1.5	L-T-P	0-0-3	Prerequisites	Computer Architecture and Organization
Continuous Internal Evaluation:	25	Semester End Evaluation:	50	Total Marks:	75

Course Outcomes		BT Level
Upon successful completion of the course, the student will be able to		
CO1	Develop programs using different class of instructions for 8086 microprocessor and ARM processor.	L3
CO2	Analyse assembly language programs; select appropriate IDE and assemble into machine of a microprocessor and microcontroller.	L4
CO3	Design electrical circuitry to the Microcontroller I/O ports in order to interface with the external devices.	L6
CO4	Make an effective lab report.	L6

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)														
Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation														
* - Average value indicates course correlation strength with mapped PO														
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	2				1	1			2	2
CO2	3	3	2	2	2				1	1			2	2
CO3	3	3	2	2	2				1	1			2	2
CO4	3	3	2	2	2				1	1			2	2
CO5	3	3	2	2	2				1	1			2	2
Average* (Rounded to nearest integer)	3	3	2	2	2				1	1			2	2

Syllabus

Unit No.	Contents	Mapped CO
	Experiments with microprocessor 8086 using Assembler:	
1	Arithmetic operations on 8 bit and 16 bit operands	CO1, CO2, CO4
2	Transfer block of data from one memory location to another memory location.	CO1, CO2, CO4
3	Programs using monitor routines.	CO1, CO2, CO4
4	Compute maximum, minimum and sorting (ascending and descending).	CO1, CO2, CO4
5	Generate Fibonacci series, average of N numbers, factorial of N.	CO1, CO2, CO4
	Experiments with ARM CORTEX M3 Processor using KEIL MDK ARM	

6	A program to toggle LED every second using timer interrupt	CO1, CO2, CO3,CO4
7	A program to interface stepper motor and rotate it in clockwise and anti-clockwise direction.	CO1, CO2, CO3,CO4
8	Display the Hex digits 0 to F on a 7-segment LED interface with an appropriate delay in between	CO1, CO2, CO3,CO4
9	Interface a 4x4 keyboard and display the key code on an LCD	CO1, CO2, CO3,CO4
10	Write a program to utilize internal PWM module and generate PWM and vary its duty cycle	CO1, CO2, CO3,CO4

Learning Resources

Text Books

1. Microprocessors and Interfacing – Programming and Hardware by Douglas V Hall, SSSP Rao, Tata McGraw Hill Education Private Limited, 3rd Edition.
2. ARM Microprocessor Systems – Cortex – M Architecture, Programming, and Interfacing by Muhammad Tahir and Kashif Javed, CRC Press.
3. The Definitive Guide to ARM Cortex-M3 and Cortex-M4 Processors by Joseph You

Reference Books

1. Embedded Systems Fundamentals with ARM Cortex-M based Microcontrollers: A Practical Approach in English, by Dr. Alexander G. Dean, Published by Arm Education Media
2. Cortex -M3 Technical Reference Manual