



Techno College of Engineering Agartala

An Engineering College Approved by AICTE, MHRD, Govt. of India

Affiliated to Tripura University (A Central University),

Department of Electronics and Communication Engineering

List of Laboratory Experiments

Microcontrollers Lab							
Course Code	Hours / Week				Maximum Marks		
	L	T	P	C	CIA	SEE	Total
PC EC 408	0	0	2	1	40	60	100
Number of classes: 20-24 Hours	Prerequisites: Digital Electronics						
Branch: ECE	Semester: VI						

Course overview:

The **Microprocessors and Microcontrollers Laboratory** provides hands-on experience in programming and interfacing techniques using assembly language and microcontroller-based systems. Students will learn fundamental concepts of data manipulation, arithmetic and logical operations, number system conversions, waveform generation, and control applications. This course emphasizes practical implementation using 8085/8086 processors and the 8051 microcontroller, enabling students to design and execute real-time applications such as data sorting, conversions, and traffic light control, thereby strengthening their embedded system skills.

Course objectives:

- i. To develop proficiency in assembly language programming for performing arithmetic, logical operations, and data manipulation tasks using microprocessors and microcontrollers.
- ii. To provide hands-on experience in number system conversions and data processing, including BCD-Binary and ASCII conversions with subroutine calls.
- iii. To familiarize students with 8051 microcontroller operations and interfacing, such as waveform generation and peripheral device control using simulators and hardware.
- iv. To enable students to design and implement microcontroller-based control systems, including practical applications like traffic light controllers and real-time data handling.

Course outcomes:

CO Number	CO Description	K-level
CO-1	Explain the execution of program in Assembly level languages of 8085 microprocessors and 8051 microcontroller using hardware kit and software tools.	K-2
CO-2	Interpret the generation of waveform using DAC by interfacing with 8051.	K-2



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CO-3	Demonstrate the BCD to Binary Conversion and vice-versa.	K-2
CO-4	Illustrate Binary to ASCII conversion and vice-versa (Using Subroutine Call)	K-2
CO-5	Built Traffic Light Controller using 8085 microprocessors and 8051 microcontroller based system.	K-6

List of Experiments (Minimum 8 experiments to be performed). Use of virtual laboratory to perform few experiments if available may be explored.

Sl. No.	EXPERIMENT NAME	CO
1.	Execution of Assembly level languages program to perform Arithmetic operation.	CO- 1
2.	Execution of Assembly level languages program to perform Logical operation.	CO- 1
3.	Execution of Assembly level languages program to find out largest, smallest number from a group of number.	CO- 1
4.	Execution of Assembly level languages program to find larger, smaller number from two numbers, to find out negative number, to count negative number from a data array.	CO- 1
5.	Execution of assembly level language program for sorting of data array in ascending and descending order.	CO- 1
6.	BCD to Binary Conversion and vice-versa.	CO- 3
7.	Familiarization with 8051 Simulator on PC. Study of prewritten programs using basic instruction set (data transfer, Load/Store, Arithmetic, Logical).	CO- 1
8.	Different waveforms generation using 8051 microcontroller based DAC.	CO- 2
9.	Binary to ASCII conversion and vice-versa (Using Subroutine Call).	CO- 4
10.	Design Traffic Light Controller using 8051 microcontroller based system.	CO- 5