Techno College of Engineering Agartala

An Engineering College Approved by AICTE, MHRD, Govt. of India
Affiliated to Tripura University (A Central University),
Department of Electrical Engineering

List of Laboratory Experiments

Microprocessor & MIcrocontroller Laboratory							
Course Code	**Hours / Week**				**Maximum Marks**		
PC EE 509	L	T	P	C	**CIA**	**SEE**	**Total**
	0	0	2	1	40	60	100
Number of classes: 24 hours			**Prerequisites:** Microprocessors and Microcontroller				
Branch: EE			**Semester: V**				

Course overview:

This laboratory course provides hands-on experience with the fundamentals of microprocessors (8085) and microcontrollers (8051). It focuses on programming in assembly language for controlling hardware components and interfacing peripheral devices. Students will explore I/O operations, timers, ADC/DAC conversions, DMA techniques, motor control, and power electronics interfacing. Through practical applications, the lab emphasizes real-time data handling, waveform generation, and the use of microprocessor-based systems in industrial and embedded environments. The course bridges the gap between digital control theory and real-world system implementation.

Course objectives:

1. **Develop proficiency** in assembly language programming for 8085 microprocessor and 8051 microcontroller.
2. **Interface peripheral devices** (like 8255, 8253, ADC/DAC) and control hardware systems using microprocessor/microcontroller.
3. **Implement real-time applications** such as waveform generation, motor control, and data acquisition.
4. **Analyze and troubleshoot** embedded system behavior through hands-on experiments involving industrial and power electronic applications.

Course outcomes:

CO Number	CO Description	K-level
CO-1	Develop Simple programming in Assembly Language of 8085 Microprocessor.	K-3
CO-2	Build the connection of peripheral devices with microprocessor using Programming in Assembly level Language	K-3
CO-3	Apply ADC and DAC to find various parameters/waveforms	K-3
CO-4	Analyze, comprehend, design microprocessor/microcontroller based systems used for control and monitoring.	K-4

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Exp. No.	Experiment Description	Mapped CO(s)
1	Hands-on practice of simple programming in Assembly Language of 8085 Microprocessor	CO-1
2	Study of 8255 PPI in I/O and BSR modes using programming in Assembly level language of 8085	CO-2
3	Study of 8253 Timer/Counter in different modes using programming in Assembly level language of 8085	CO-2
4	Study of DMA mode of data transfer techniques using programming in Assembly level language of 8085	CO-2
5	Measurement of voltage, current & physical quantities using ADC technique via 8085 programming	CO-3
6	Generation of different periodic waveforms using DAC technique via 8085 programming	CO-3
7	Speed control of DC servo/stepper motor using programming in Assembly level language of 8085	CO-4
8	Interfacing & triggering of SCRs at different angles using microprocessor/microcontroller programming	CO-4
9	Interfacing & characteristics of SCR-based half/full controlled converter using microprocessor/microcontroller programming	CO-4