Semester	IV	Course Title	Microcontroller Lab	Course Code	18 ECL 47
Teaching Period	50 Hours	L – T – P – TL*	0 – 0 – 3 – 3	Credits	2
CIE*	40 Marks	SEE*	60 Marks	Total	100 Marks
CREDITS – 02					

Course Learning Objectives: This laboratory course enables students to

- Understand the basics of microcontroller and its applications.
- Have in-depth knowledge of 8051 assembly language programming.
- Understand controlling the devices using C programming.
- The concepts of I/O interfacing for developing real time embedded systems.

Laboratory Experiments:

I. PROGRAMMING

1. Data Transfer: Block Move, Exchange, Sorting, Finding largest element in an array.
2. Arithmetic Instructions - Addition/subtraction, multiplication and division, square, Cube – (16 bits Arithmetic operations – bit addressable).
3. Counters.
4. Boolean & Logical Instructions (Bit manipulations).
5. Conditional CALL & RETURN.
6. Code conversion: BCD – ASCII; ASCII – Decimal; Decimal - ASCII; HEX - Decimal and Decimal - HEX.

II. INTERFACING

1. Write a C program to rotate Stepper motor control interface to 8051.
2. Write a C program to rotate DC motor control interface to 8051.
3. Write a C program for Elevator interface to 8051.
4. Write a C program for SEVEN SEGMENT DISPLAY.
5. Generate different waveforms Square, Triangular, using DAC interface to 8051; change the frequency and amplitude.

Course Outcomes: On the completion of this laboratory course, the students will be able to:

- Analyze 8051 assembly level programs to perform data transfer, arithmetic, Boolean and logical operations.
- Analyze 8051 assembly level programs to perform counter operation along with conditional call and return operation.
- Analyze 8051 assembly level programs to perform code conversion operation like BCD, ASCII, decimal and Hex operation.
- Demonstrate the interfacing of 8051 C Programs with Stepper Motor, DC Motor, Elevator Interface, and 7 segment displays.
- Demonstrate the interfacing of 8051 C Programs to generate different square, Triangular waveform using DAC.

Conduct of Practical Examination:

- All laboratory experiments are to be included for practical examination.
- Students are allowed to pick one experiment from the lot.
- Strictly follow the instructions as printed on the cover page of answer script for breakup of marks.
- Change of experiment is allowed only once and 15% Marks allotted to the procedure