DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	**BACHELOR OF TECHNOLOGY ELECTRONICS AND COMMUNICATION ENGINEERING**		
Course Title	**MICROPROCESSOR AND MICROCONTROLLER LABORATORY**		
Course Code	**ECLR13**	**No. of Credits**	**2**
Course Code of Co-requisite subject(s)	**ECPE12 MICROPROCESSORS AND MICROCONTROLLERS**		
Session	**January 2023**	**Section (if, applicable)**	**B**
Name of Faculty	**Dr. Srinivasulu Jogi**	**Department**	**ECE**
Email	**srinivasulu@nitt.edu**	**Telephone No.**	**8248835354**
Name of Course Coordinator(s) (if, applicable)			
E-mail		**Telephone No.**	
Course Type	√ **Core course** ☐ **Elective course**		

Syllabus (approved in BoS)

List of Experiments:
Intel 8086 –16bit µP-Emulator.

1. Addressing modes of 8086 Microprocessor.
2. Block move and simple arithmetic operations.
3. Identification and displaying the activated key using DOS and BIOS function calls.

Intel 8051 (8-bit Microcontroller) -Proteus VSM Simulator and Trainer Kit.

4. Addressing modes of 8051 Microcontroller.
5. Delay generation -i) Nested loop and ii) Timers.
6. Toggling the ports and counting the pulses.
7. LCD Interfacing.
8. Generation of different waveforms using DAC (0808)
9. ADC interfacing.

Mixed-Signal Microcontroller –16bit –MSP430 series

10. PWM generation and speed control of Motors using MSP430

COURSE OBJECTIVES

This course deals with several languages used for programming a Microprocessors and Microcontrollers through industry-standard compilers, Macro Assemblers, Debuggers, Real-time Kernels, and system-level simulators. Using the hardware kits to get the hands-on experience on 16-bit Microprocessor, 8-bit and 16-bit Microcontrollers and also interfacing the different peripherals.

COURSE OUTCOMES (CO)

Course Outcomes	**Aligned Programme Outcomes (PO)**
After successful completion of the course, the students are able to	

CO1: Train their practical knowledge through laboratory experiments.	PO4, PO5, PO8 -H PO11, PO12 -M PSO1 PSO2-M PSO3-L
CO2: Understand and write the assembly language programs to control the systems.	
CO3: Learn system-level simulator and design complete Microcontroller based modules.	
CO4: Study Code Composer Studio to develop and debug embedded applications	
CO5: Do projects in IoT applications.	
	H-High-3 M- Medium-2 L-Low-1

COURSE PLAN – PART II

COURSE OVERVIEW

This course deals with several languages used for programming a Microprocessors and Microcontrollers. The instructions are written as words called mnemonics rather than binary values and a program called an assembler translates the mnemonics into machine code. Some Microcontrollers use high level languages. The compiler produces machine code directly.

The industry standard Keil C compilers, Macro Assemblers, Debuggers, Real time kernals, and single board computers support all the Microcontrollers. Intelligent schematic input system provides the development environment for PROTEUS VSM, the revolutionary interactive system level simulator. This product combines mixed mode circuit simulation, Microprocessor models and interactive component models to allow the simulation of complete Microcontroller based designs.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Fourth week of January	Emulator 8086 Addressing modes of 8086 Microprocessor	Demo (Experiment -1)
2	First week of February	Block move and simple arithmetic operations	(Experiment -2)
3	Second week of February	Array addition and Sorting	(Experiment -3)
4	Third week of February	Identification and displaying the activated key using DOS and BIOS function calls.	(Experiment -4)
5	Fourth week of February	Keil, Proteus VSM, ESA 51E trainer Kit Addressing modes of 8051 Microcontroller	Demo (Experiment -5)
6	First week of March	Delay generation - i) Nested loop and ii) Timers.	(Experiment -6)
7	Second week of March	Toggling the ports and counting the pulses.	(Experiment -7)
8	Third week of March	LCD Interfacing.	(Experiment -8)
9	Fourth week of March	Generation of different waveforms using DAC (0808)	(Experiment -9)
10	First week of April	Code Composer studio	Demo

		PWM generation and speed control of Motors using MSP430	(Experiment -10)
11	Second week of April	Redo lab	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment -1 Record	Submit every week after the completion of the experiment.		25 marks
2	Assessment -2 Internal Lab exam (8086)	March first week	1 Hour	15 marks
3	Assessment -3 Viva Exam (MCQs-Written exam)	April third week	1 Hour	20 marks
4	Assessment -4 Mini Project	April last week (Submission)		10 marks
5	Assessment -5 End semester Lab exam (8051)	May first week	2 Hours	30 marks

***mandatory; refer to guidelines on page 4**

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

Course feedback is assessed through

1. Class committee meeting
2. Frequently ask the questions in the class and analyzes the responses
3. Course exit survey form

Course Attainment is calculated through

Direct tools (Exams and Assignments)

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)

Information regarding this course will be intimated in class/ over phone/ through their webmail.

COMPENSATION ASSESSMENT POLICY

1. Any student who fails to maintain 75% attendance only on reasonable medical grounds needs to appear for the compensation assessment (CPA) classes (Repeat lab). On successful completion of CPA classes along with assessment criteria will be eligible for attending the end semester examination.
2. If any of the student is not able to complete the experiments due to some reason may appear for attending the Repeat lab.
3. Submission of record, Assessment 2,3 and 4 are MANDATORY for every student within the stipulated time failing which 70% weightage will not be considered for final grade assessment.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- **At least 75% attendance in each course is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**
- Students with **less than 65% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**

ACADEMIC DISHONESTY & PLAGIARISM

1. Sharing the answers through electronic media or any other mode will be treated as dishonesty and it is punishable.
2. Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
3. The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION

Any queries send a mail to srinivasulu@nitt.edu

FOR APPROVAL

Course Faculty _____ **CC-Chairperson** _____ **HOD** _____