

Branch Name:	Electrical Engineering
Program Code:	ET109
Course Name:	Microcontroller and Interfacing Practical
Course Code:	2ET1090602P
Pre-requisite Course:	Digital Electronics, Analog Electronics, Microprocessor

Course Objectives:

1. The objective of the course is to expose to the students to the architecture and instruction set of 8-bit microcontroller.
2. It also deals with Assembly Language Programming and Embedded C Programming using Keil vision Software.
3. Input-output techniques, programming of important programmable support chips as well as different external hardware's used in microcontroller-based systems are discussed in detail.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								Total (Marks)
					Theory (Marks)				Practical (Marks)				
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1	-	-	2	2	-	-	-	-	10	25	10	25	50

Course Contents:

Sr. No	Detail of Practical	Contact Hours
1	Introduction to IDE and Assembler directives.	02
2	8051 Assembly language programming for addition, subtraction, multiplication and division of two 8-bit numbers.	02
3	8051 Assembly language programming for block data transfer between internal and external memory including overlapping blocks.	02
4	8051 Assembly language programming using Arithmetic instructions.	02
5	8051 Assembly language programming using Logical Instructions.	04
6	8051 Assembly language programming for code conversions.	04
7	8051 Assembly language programming for Timers in different modes.	04
8	Speed Control of DC motor using PWM Technique and Microcontroller.	02
9	I/O port programming in embedded C.	02
10	Timers and Counters programming in embedded C for time delay and frequency measurement using ISRs.	02
11	Interface LCD display with 8051 kit.	02
12	Digital clock programming using 7- segment display in embedded C.	02

Reference Books:

1. Using the MCS-51 Microcontrollers by Han Way Huang, Oxford Uni Press, 2013.
2. Programming and Customizing the 8051 Microcontroller by Myke Predko, Tata Mcgraw Hill, 2006.

ICT/MOOCs Reference:

1. NPTEL (www.nptel.ac.in)
2. Kiel vision IDE (<http://www.keil.com/dd/chip/2976.htm>)

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Apply the concept of buses, microcontroller architecture and interrupts.	3 Applying
CLO2	To understand program assembly language programming/ C programming of 8051.	2 Understanding
CLO3	To understand the Interface memory and I/O devices with 8-bit microcontroller.	2 Understanding
CLO4	To design microcontroller based small system	5 Evaluate
CLO5	To analyze basics of serial communication.	4 Analyze
CLO6	To identify Concept of Interrupt.	1 Remembering

Mapping of CLOs with POs & PSOs:

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	L					M		L			L		L	L		
CLO2			M	L			L		M	L		L			L	
CLO3		H			M	L										L
CLO4	L			M			M		H		L			M	L	
CLO5			L			L									L	
CLO6		M			L			M		M		M	L			L

H: High, M: Medium, L: Low