



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad – 500043

Electronics and Communication Engineering

List of Laboratory Experiments

EMBEDDED SYSTEMS DESIGN LABORATORY								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
AECC53	Core	0	0	4	2	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36			Total Classes:36			
Branch: ECE	Semester: VII	Academic Year: 2021-22			Regulation: UG20			
<p>Course overview: This laboratory course is intended to train the students on various embedded modules and embedded C language. This course provides hands-on experience of programming on input/output (I/O) devices and Keil μVision tool. The lab allows students to learn the interfacing of input/output (I/O) devices to increase student interest and develop skills to build embedded systems.</p> <p>Course objectives:</p> <ol style="list-style-type: none"> I. The demonstration of Keil IDE tool and 8051 Microcontroller Development Kit for the implementation of embedded systems. II. The interfacing of I/O devices with 8051 microcontroller using embedded C language III. The interfacing of analog to digital converters (ADC) and digital to analog converters (DAC) with 8051 microcontroller to convert signals from one form to another form. <p>Course outcomes:</p> <p>CO1: Analyze the embedded systems programming in C with Keil Integrated Development Environment (IDE).</p> <p>CO2: Make use of embedded software development tools for debugging and testing of embedded applications.</p> <p>CO3: Summarize the concepts of embedded systems and formalisms for system design with examples.</p> <p>CO4: Build an interface between processor/controller and embedded peripherals to provide solutions to the real world problems.</p> <p>CO5: Choose serial communication for transmitting the data between processor/controller and peripherals in embedded systems designing.</p> <p>CO6: Utilize A/D and D/A converters with processor/controller for data conversion in embedded environment.</p>								
WEEK NO	EXPERIMENT NAME							CO
WEEK – I	DEVELOP PROGRAM USING KEIL IDE TOOL							CO1
	Design and develop a reprogrammable embedded computer using 8051 microcontrollers and to show the following aspects. a. Programming b. Execution c. Debugging To Demonstrate the Tool Chain for Keil IDE (Embedded Systems Development Tool Chain) with the example of LED Blinking Program.							
WEEK – II	INTERFACING LED WITH DIFFERENT PORT PINS							CO2
	a) Program to toggle all the bits of port P1 continuously with 250 ms delay b) Program to toggle only the bit P1.5 continuously with some delay							
WEEK – III	INTERFACING BUZZER AND SWITCH							CO4
	Program to interface a switch and a buzzer to two different pins of a port such that the buzzer should sound as long as the switch is pressed.							
WEEK – IV	INTERFACING LCD DISPLAY							CO4

	Program to interface LCD data pins to port P1 and display a message on it using P89V51RD2	
WEEK – V	INTERFACE HEXA KEYPAD	CO2
	Program to 4*4 interface keypad. Whenever a key is pressed, it should be displayed on LCD	
WEEK – VI	INTERFACE SEVEN SEGMENT DISPLAY	CO4
	Program to interface seven segment display using 89V51RD2	
WEEK – VII	SERIAL COMMUNICATION INTEFACING	CO6
	Program for serial communication between Microcontroller to PC communication the data should be transfer frommicrocontroller to PC terminal window using 89V51RD2	
WEEK –VIII	SERIAL COMMUNICATION INTEFACING	CO6
	Program for serial communication between PC to Microcontroller communication the data should be transfer from PC to Microcontroller terminal window using 89V51RD2	
WEEK - IX	INTERFACING WITH TEMPERATURE SENSOR	CO5
	Program to develop necessary interfacing circuit to read data from Temperature sensor and process usingP89V51RD2, the data has to display terminal window	
WEEK - X	INTERFACING STEPPER MOTOR	CO5
	Program to interface Stepper Motor to rotate the motor in clockwise and anticlockwise directions	
WEEK - XI	INTERFACING MULTPLE DEVICES	CO6
	Program to verify run 2 to 3 tasks simultaneously on P89V51RD2 SDK. Use LCD interface, LED interface, Serial communication.	
WEEK - XII	INTERFACE ADC DEVICE	CO5
	Program to interface ADC device with P89V51RD2 and display value on LCD	
WEEK - XIII	INTERFACE DAC DEVICE	CO5
	Program to interface DAC device with P89V51RD2 and observer the analog output in CRO	
WEEK - XIV	INTERFACE RELAY	CO5
	Program to interface Relay with P89V51RD2 using transistor	
WEEK - XV	INTERRUPT	CO4
	Program to toggle LEDS using simple INTERRUPT	