

EMBEDDED PROGRAMMING LABORATORY

I Semester: M TECH (ES)								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
BESB09	Core	L	T	P	C	CIA	SEE	Total
		-	-	3	2	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36			Total Classes: 36			
<p>COURSE OBJECTIVES : The course should enable the students to:</p> <p>I. Use embedded C for reading data from port pins. II. Understand the interfacing of data I/O devices with microcontroller. III. Understand serial communication and port RTOS on microcontroller.</p> <p>COURSE OUTCOMES (COs):</p> <p>CO 1 Understand the programs for LED blinking and to interface the devices like switch, buzzer and LCD with P89V51RD2. CO 2 Implement the programs for interfacing of data I/O devices like seven segment display, keypad and RS232 with P89V51RD2. CO 3 Write the programs for interfacing stepper motor and temperature sensor. CO 4 Understand the real time operating system, inter task communication and analog to digital conversions. CO 5 Write the programs for interfacing digital to analog conversion and elevator.</p>								
Week-1	LED BLINKING							
Program to toggle all the bits of port P1 continuously with 250 ms delay.								
Week-2	INTERFACING OF SWITCH AND BUZZER							
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-3	INTERFACING OF LCD							
Program to interface LCD data pins to port P1 and display a message on it.								
Week-4	INTERFACING SEVEN SEGMENT DISPLAY							
Program to interface seven segment display.								
Week-5	INTERFACING OF KEYPAD							

Program to interface keypad. Whenever a key is pressed, it should be displayed on LCD.	
Week-6	SERIAL COMMUNICATION
Program to transmit message from microcontroller to PC serially using RS232. Program to receive a message from PC to microcontroller serially using RS232.	
Week-7	INTERFACING OF STEPPER MOTOR
Program to interface Stepper Motor to rotate the motor in clockwise and anticlockwise directions.	
Week-8	INTERFACING TEMPERATURE SENSOR
Program to read data from temperature sensor and display the temperature value.	
Week-9	PORTING OF RTOS
Port RTOS on to 89V51 Microcontroller and verify. Run 2 to 3 tasks simultaneously on 89V51 SDK. Use LCD interface, LED interface, Serial communication.	
Week-10	INTERFACING OF ADC
Program to convert analog signal into digital (ADC)	
Week-11	INTERFACING OF DAC
Program to convert Digital into Analog (DAC).	
Week-12	INTERFACING OF ELEVATOR
Program to interface Elevator.	
Reference Books:	
1. Michael J. Pont, "Embedded C", Pearson Education, 2nd Edition, 2008. 2. Nigel Gardner, "The Microchip PIC in CCS C". Ccs Inc, 2nd Revision Edition, 2002	
SOFTWARE AND HARDWARE REQUIREMENTS FOR 18 STUDENTS	
SOFTWARE: System Software: Microsoft windows/ Linux Programming Languages: Keil Embedded C.	
HARDWARE: 18 numbers of Intel Desktop Computers with 2 GB RAM Dot matrix Printers: 02	