B.E ELECTRONICS AND COMMUNICATION ENGINEERING

Choice Based Credit System (CBCS)

SEMESTER – VI

8051 Microcontroller (3:0:0) 3

(Effective from the academic year 2021-22)

Course Code	**21EC655**	CIE Marks	50
Teaching Hours/Week (L:T:P)	3:0:0	SEE Marks	50
Total Number of Contact Hours	40	Exam Hours	03

Course Objectives:

This course will enable students to:

1. Understand the difference between Microprocessor and Microcontroller
2. Learn instruction sets to write various assembly programs
3. Comprehend the operation and use of inbuilt Timers/Counters and Serial port of 8051
4. Interface 8051 to external memory and I/O devices using its I/O ports

Module – 1

8051 Microcontroller: Microprocessor Vs Microcontroller, Embedded Systems, Embedded Microcontrollers, 8051 Architecture- Registers, Pin diagram, I/O ports functions, Internal Memory organization. External Memory (ROM & RAM) interfacing.

(8 Hours)

Module – 2

8051 Instruction Set: Addressing Modes, Data Transfer instructions, Arithmetic instructions, Logical instructions, Branch instructions, Bit manipulation instructions. Simple Assembly language program examples (without loops) to use these instructions. **(8 Hours)**

Module – 3

8051 Stack, I/O Port Interfacing and Programming: 8051 Stack, Stack and Subroutine instructions. Assembly language program examples on subroutine and involving loops - Delay subroutine, Factorial of an 8 bit number (result maximum 8 bit), Block move without overlap, Addition of N 8 bit numbers, Picking smallest/largest of N 8 bit numbers.

Interfacing simple switch and LED to I/O ports to switch on/off LED with respect to switch status**.**

(8 Hours)

Module – 4

8051 Timers and Serial Port: 8051 Timers and Counters – Operation and Assembly language programming to generate a pulse using Mode-1 and a square wave using Mode-2 on a port pin. 8051 Serial Communication- Basics of Serial Data Communication, RS-232 standard, 9 pin RS232 signals, Simple Serial Port programming in Assembly and C to transmit a message and to receive data serially. **(8 Hours)**

Module – 5

8051 Interrupts and Interfacing Applications: 8051 Interrupts. 8051 Assembly language programming to generate an external interrupt using a switch, 8051 C programming to generate a square waveform on a port pin using a Timer interrupt. Interfacing 8051 to ADC-0804, LCD and Stepper motor and their 8051 Assembly language interfacing programming.

Summery/Recap of all the modules

(8 Hours)

Course Outcomes: The students will be able to:

CO1: Understand and differentiate the Architecture of microprocessor and microcontroller.

CO2: Analyze and Apply instructions for assembly programs.

CO3: Analyze the functions of on-chip peripherals.

CO4: Develop a small embedded system.

Textbooks/References:

Title & Edition	Author	Publisher	Year of Publication	Text / Reference
8051 Micro controller and Embedded System	Muhammad Ali Mazidi and Janice Gillispi Mazidi	Pearson Education Publication	2nd Edition, 2006	Text
Advanced Microprocessors and Peripherals	A.K. Ray and K.M. Bhurchandi	TMH, 3rd Edition	2012	Text
The 8051 Microcontroller Based Embedded Systems	Manish K Patel	McGraw Hill, 1st Edition	2014	Reference
Microcontrollers: Architecture, Programming, Interfacing and System Design	Raj Kamal	Pearson Education	3rd Edition, 2005	Reference

COs and POs Mapping

COs	PO's											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	1											
CO2		3										
CO3		3										
CO4			3							1		1

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped