MICROCONTROLLERS AND INTERFACING

Course Code	20EC5402	**Year**	II	**Semester**	II
Course Category	Minor	**Branch**	ECE	**Course Type**	Theory
Credits	4	**L-T-P**	3-1-0	**Prerequisites**	Nil
Continuous Internal Evaluation:	30	**Semester End Evaluation:**	70	**Total Marks:**	100

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	Summarize programmer's model of 8051 microcontroller. (L2)
CO2	Apply knowledge and demonstrate programming proficiency using the various addressing modes and instructions of the microcontroller. (L3)
CO3	Effectively utilize peripherals such as interrupts, timers, and serial communications to develop microcontroller based systems. (L3)
CO4	Develop programs to interface various peripherals with microcontroller. (L3)

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)

Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation

* - Average value indicates course correlation strength with mapped PO

CO/PO & PSO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO 11**	**PO12**	**PSO1**	**PSO2**
CO 1	2									2			2	2
CO 2	2					2				2			2	2
CO 3	3					3				3			3	3
CO 4	2					2				2			2	2
Average* (Rounded to nearest integer)	**2**					2				**2**			**2**	**2**

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**8051 Microcontroller** Microcontrollers, Types of Microcontrollers, 8051 Microcontroller Architecture, Microcontroller 8051 Pins, 8051 Ports, Internal and External Memory.	CO1
II	**8051 Instruction Set** Addressing Modes, Data Transfer instructions, Arithmetic instructions, Logical instructions, Branch instructions, Bit manipulation instructions. Simple Assembly language programs.	CO2
	Real Time control: Interrupts	CO3

III	Routine, Interrupt and Interrupt service routine, Interrupt Handling structure of an MCU, Sources of interrupts, Enabling or disabling of the sources, interrupt structure in 8051.	
IV	**Real Time control: Timers and Serial Port** Programmable timers in the MCUs, Timer modes, Free running counter and real time control, Software timers, Serial Communication modes.	CO3
V	**8051 Interfacing Applications** LCD interfacing, Keyboard interfacing, ADC interfacing, DAC interfacing, Stepper motor interfacing and their 8051 Assembly language programming.	CO3, CO4

Learning Resources
Text Books
1. Raj Kamal-Microcontrollers: Architecture, Programming, Interfacing and System Design, 2nd Ed., Pearson. 2. Muhammad Ali Mazidi, Janice Gillespie Mazidi and Rollin D. McKinlay- The 8051 Microcontroller and Embedded Systems – using assembly and C", Pearson, 2nd Ed.
References
1. Kenneth J. Ayala- The 8051 Microcontroller, 3rd Ed., Thomson/Cengage Learning.