

MICROPROCESSORS AND MICROCONTROLLERS

Course Code	20EE3602	Year	III	Semester	II
Course Category	Professional Core	Branch	EEE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Digital and Analog Circuits
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	Understand the basic features and hardware details of 8086 Microprocessors and 8051 Microcontrollers.	L2
CO2	Demonstrate architecture, signal description, addressing modes and instruction set of 8086 microprocessors and 8051 microcontrollers.	L3
CO3	Develop 8086 and 8051 assembly language programs to perform a given task.	L3
CO4	Analyze interfacing of various peripherals and memories with 8086 and 8051.	L4
CO5	Illustrate real-time application of 8086 Microprocessors and 8051 Microcontrollers.	L4
CO6	Submit a report on 8086 Microprocessors and 8051 Microcontrollers	--

Strength of correlations (3:High, 2: Medium, 1:Low)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1														
CO2	3												2	
CO3	3				1								3	2
CO4		3				1						1	3	2
CO5		3			1	1	1						3	3
CO6								1	3	3	1			

Syllabus		
Unit No.	Contents	Mapped CO
I	Intel 8086 Introduction and evolution of Microprocessors, Architecture of 8086, Register Organization of 8086, Memory Organization of 8086, Pin diagram of 8086. Minimum and Maximum mode operations of 8086, General Bus	CO1, CO2, CO6

	Operation of 8086, Read and Write cycle timing diagram.	
II	ASSEMBLY LANGUAGE PROGRAMMING Addressing Modes and Instruction set, Assembler Directives, Procedures and Macros, simple assembly language programming – Factorial of a number, Logical, Shift and Rotate operations and sorting numbers in ascending and descending order.	CO1, CO2, CO3, CO6
III	Basic Peripherals 8255 PPI, Architecture of 8255 PPI, Various modes of operation of 8255. Programmable DMA Controller 8257, Programmable Interrupt Controller 8259, Serial Communication Interface USART 8251.	CO1, CO4, CO6
IV	8051 Microcontrollers Intel 8051 architecture, memory organization, flags, stack, and special function registers, I/O, ports counters and timers, serial data I/O, interrupts. Addressing modes, instructions set.	CO1, CO2, CO6
V	8051 Assembly Language Programming Simple assembly language Programming – Arithmetic operations, Swap, set and reset a bit/byte. Interfacing and Applications Interfacing external memory, Interfacing of LED's, ADC (ADC 0808)	CO1, CO3, CO4, CO5, CO6
Learning Resources		
Text Books		
<ol style="list-style-type: none"> 1. Douglas V. Hall, “Microprocessors and Interfacing”, TMH-Revised 2nd edition, 2006. 2. A. K. Ray and K. M. Burchandi, “Advanced Microprocessors and interfacing”, Tata McGraw Hill, 2nd edition, 2006. 3. Kenneth J. Ayala, “The 8051 Microcontroller Architecture, Programming and Applications”, Thomson Publishers, 2nd Edition, 2004 		
Reference Books		
<ol style="list-style-type: none"> 1. Ajay V. Deshmukh, “Microcontrollers – Theory & Applications”, Tata McGraw Hill, 2005. 2. M.A. Mazidi, R.D. McKinlay, J.G. Mazidi, “The 8051 Microcontroller: A Systems Approach”, Pearson, 2013. 3. Kenneth J Ayala, “The 8086 Microprocessors Architecture, Programming and Interfacing the PC”, West Publishers, 1995. 		
e- Resources & other digital material		
<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses/108/103/108103157/ 2. https://nptel.ac.in/courses/108/107/108107029/ (Web Content) 3. https://nptel.ac.in/courses/108/105/108105102/ 		