

23CS31E3 - MICROPROCESSORS AND MICROCONTROLLERS

Course Category:	Professional Elective - I	Credits:	3
Course Type:	Theory	Lecture-Tutorial-Practical:	3-0-0
Prerequisite:	<ul style="list-style-type: none"> Knowledge in Microprocessors And Microcontrollers 	Sessional Evaluation: 30 Univ. Exam Evaluation: 70 Total Marks: 100	
Course Objectives:	Students undergoing this course are expected: <ul style="list-style-type: none"> To comprehend the architecture, operation, and configurations of the 8086 microprocessors. To get familiar with 8086 programming concepts, instruction set, and assembly language development tools. To study the interfacing of 8086 with memory, peripherals, and controllers for various applications. To learn the architecture, instruction set, and programming of the 8051 microcontrollers. To understand microcontroller interfacing techniques, peripheral programming, and processor comparisons 		

Course Outcomes:	Upon successful completion of the course, the students will be able to:	
	CO1	Gain knowledge on the architecture, operation, and configurations of the 8086 microprocessors..
	CO2	Get familiar with 8086 programming concepts, instruction set, and assembly language development tools.
	CO3	Know the interfacing of 8086 with memory, peripherals, and controllers for various applications.
	CO4	Learn the architecture, instruction set, and programming of the 8051 microcontrollers.
	CO5	Understand microcontroller interfacing techniques, peripheral programming, and processor comparisons.
Course Content:	<p style="text-align: center;"><u>UNIT-I</u></p> <p>8086 Architecture: Main features, pin diagram/description, 8086 microprocessor family, internal architecture, bus interfacing unit, execution unit, interrupts and interrupt response, 8086 system timing, minimum mode and maximum mode configuration</p> <p style="text-align: center;"><u>UNIT-II</u></p> <p>8086 Programming: Program development steps, instructions, addressing modes, assembler directives, writing simple programs with an assembler, assembly language program development tools</p>	

	<p style="text-align: center;"><u>UNIT-III</u></p> <p>8086 Interfacing: Semiconductor memories interfacing (RAM, ROM), Intel 8255 programmable peripheral interface, Interfacing switches and LEDs, Interfacing seven segment displays, software and hardware interrupt applications, Intel 8251 USART architecture and interfacing, Intel 8237a DMA controller, stepper motor, A/D and D/A converters, Need for 8259 programmable interrupt controllers.</p> <p style="text-align: center;"><u>UNIT-IV</u></p> <p>Microcontroller - Architecture of 8051 – Special Function Registers (SFRs) - I/O Pins Ports and Circuits - Instruction set - Addressing modes - Assembly language programming..</p> <p style="text-align: center;"><u>UNIT-V</u></p> <p>Interfacing Microcontroller - Programming 8051 Timers - Serial Port Programming - Interrupts Programming – LCD & Keyboard Interfacing - ADC, DAC & Sensor Interfacing - External Memory Interface- Stepper Motor and Waveform generation - Comparison of Microprocessor, Microcontroller, PIC and ARM processors.</p>
Text Books & References Books:	<p>TEXTBOOKS:</p> <ol style="list-style-type: none"> 1. Microprocessors and Interfacing – Programming and Hardware by Douglas V Hall, SSSP Rao, Tata McGraw Hill Education Private Limited, 3rd Edition, 1994. 2. K M Bhurchandi, A K Ray, Advanced Microprocessors and Peripherals, 3rd edition, McGraw Hill Education, 2017. 3. Raj Kamal, Microcontrollers: Architecture, Programming, Interfacing and System Design, 2nd edition, Pearson, 2012 <p>REFERENCE BOOKS:</p> <ol style="list-style-type: none"> 1. Ramesh S Gaonkar, Microprocessor Architecture Programming and Applications with the 8085, 6th edition, Penram International Publishing, 2013. 2. Kenneth J. Ayala, The 8051 Microcontroller, 3rd edition, Cengage Learning, 2004.
E-Resources:	NPTEL