III Year-II Semester		T	P	C
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Microprocessors & Microcontrollers(RT32041)

Prerequisite Course:

Switching Theory and Logic Design

Course Description and Objectives:

- Learn concepts of microprocessor, different addressing modes and programming of 8086.
- Understanding interfacing of 8086, with memory and other peripherals.
- Learn concept of DMA, USART RS-232 and PIC controller.
- Study the features of advanced processors and Pentium processors.
- Study the features of 8051 Microcontroller, its instruction set and also other controllers.

Course Outcomes:

Upon completion of the course, the student will be able to achieve the following outcomes.

COs	Course Outcomes	POs
1	Develop programs for different addressing modes	3
2	Perform 8086 interfacing with different peripherals and implement programs.	3
3	Describe the key features of serial and parallel communication	3
3	Design a microcontroller for simple applications	3

SYLLABUS

UNIT – I

8086/8088 MICROPROCESSORS:

Register organization of 8086, Architecture, Signal description of 8086, Physical memory organization, General bus operation, I/O addressing capability, Special purpose activities, Minimum mode, Maximum mode of 8086 system and timings, the processor 8088, Machine language formats, Addressing mode of 8086, Instruction set of 8086, Assembler directives and operators.

UNIT – II

PROGRAMMING WITH 8086 MICROPROCESSOR:

Machine level programs, Programming with an assembler, Assembly language programs, Introduction to stack, Stack structure of 8086/8088, Interrupts and interrupt service routines, interrupt cycle of 8086, Non-maskable interrupt and Maskable interrupts, Interrupt programming.

UNIT – III

BASIC AND SPECIAL PURPOSE PROGRAMMABLE PERIPHERALS AND THEIR INTERFACING WITH 8086/8088:

Semiconductor memories interfacing, Dynamic RAM interfacing, Interfacing I/O ports, PIO 8255 modes of operation of 8255, Interfacing to D/A and A/D converters, Stepper motor interfacing, Control of high power devices using 8255, Programmable interrupt

controller 8259A, The Keyboard/Display controller 8279, Programmable communication interface 8251 USART, DMA controller 8257.

UNIT – VI

ADVANCED MICROPROCESSORS:

Salient features of 80386DX, Architecture and Signal description of 80386, Register organization of 80386 and addressing modes, Instruction set of 80386, The coprocessor 80387.

UNIT – V

8051 MICROCONTROLLER:

Introduction to microcontrollers, 8051 Microcontrollers, 8051 Pin description, Connections, I/O ports and memory organization, MCS51 addressing modes and instructions, Assembly language programming tools.

UNIT – VI

PIC MICROCONTROLLER AND ARM 32-BIT MICROCONTROLLER:

Overview and features, PIC 16Cx/7X instructions, Interrupts in PIC 16C61/71, PIC 16F8XX Flash controllers, I/O ports and timers, Introduction to 16/32-bit processors, ARM architecture and organization, ARM/THUMB programming model, ARM/THUMB instruction set.

TEXTBOOKS:

1. A. K. Ray, K. M. Bhurchandi, "Advanced Microprocessors and Peripherals", Tata McGraw Hill Publications, 2000.
2. N. Senthil Kumar, M. Saravanan, S. Jeevanathan, "Microprocessors and Microcontrollers", Oxford University Press, 2010.

REFERENCES:

1. Ajay V Deshmukh, "Microcontrollers", Tata McGraw Hill Publications, 2012.
2. Krishna Kant, Microprocessors and Microcontrollers", PHI Publications, 2010.