

Learning outcomes:

Upon the successful completion of this course, a student should be able to

- Understand the 8085 and 8051 microcontrollers and its architecture
- Being able to write an assembly level and C programs
- Being able to design a hardware interfacing circuit comprising a microcontrollers and supporting ICs to construct a useful electronic embedded system

Syllabus:

Unit No.	Topics	Hours
1	Introduction of 8085 microprocessor Architectural Block Diagram, Schematic and Pin diagrams, Pin functions, Bus Organization, Internal operations and registers, Externally initiated operations, Serial interrupt and I/O Control, Brief Introduction of Instruction and assembly language program, Timing and Control Unit, Microprocessor communication, Multiplexing of address / data bus, Generation of control signals, 8085 machine cycles	10
2	8051 Architecture Comparing Microprocessors and Microcontrollers -The 8051 Architecture-Hardware- Oscillator and clock-program counter –data pointer-registers-stack and stack pointer-special function registers- memory organization-program memory-data memory -Input / Output Ports –External memory counter and timer-serial data Input / output-Interrupts	12
3	8051 PROGRAMMING IN C Basics of 8051 Assembly Language Programming-Structure of Assembly language- Basics of 8051 C Language Programming-Structure of C language, Assembling and running an 8051 program- Addressing modes-Accessing memory using various addressing modes- Arithmetic operations and Programs- Logical operations and Programs -Branching - I/O Port Programs - Single bit instructions and Programs –Timer and counter - and Programs	10
4	Interrupts and serial communication Concept of Interrupt, interrupt versus polling, Types of interrupts in 8051, 8051 Serial Communication -Connection to RS-232- Serial Communication Programming- Interrupts Programming	6
5	Interfacing memory and IOs Microcontroller Interfacing - Memory address decoding, interfacing 8031/8051 with ROM/EPROM and Data ROM Key Board - Displays- Pulse Measurement - D/A and A/D conversion- Stepper Motor module	7

Reference Books:

1. The 8051 Microcontrollers and Embedded Systems: Muhammed Ali Mazidi
2. The 8051 Microcontrollers Architecture, Programming & Applications Kenneth J. Ayala
3. Programming and Customizing the 8051 Micro-controller, Myke Predko, Tata McGraw-Hill Edition
4. Embedded Systems, Shibu K, Tata McGraw Hill Publishing, New Delhi 2009
5. Microprocessor Architecture, Programming, and Applications with the 8085, By Romesh Gaonkar, Penram International Publishing (India) LTD