

ELI- 701: 8051 & Advanced Microcontrollers

48 Periods

UNIT 1

Introduction to RISC microcontrollers. Von- Neumann and Harvard architectures , Introduction to 8051 family microcontrollers. 8051 architecture, Register banks and Special Function Registers. 10 Periods

UNIT 2

Memory organization. Addressing modes, Instruction set: Data transfer, Arithmetic, Logical, Boolean and Branch instructions. Oscillator and Clock Circuit, Input / Output Ports, Timers, Serial Interface, Interrupts, External Interrupts. 8051 Programing 16 Periods

UNIT 3

8051 interfacing with Keyboard, display Units (LED, 7-segment display, LCD), ADC, DAC, Stepper motor , Introduction to AVR family and its architecture 11 Periods

UNIT4

Introduction to advanced 16-bit Microcontroller -8096/80196 family, Architecture, Instructions,I/O features-Use of PTS to facilitate DMA, Timers, Difference between 8051 and 80196, difference in I2C and CAN bus 11 Periods

UNIT 1

Chapter 1, 2 – Mazidi M.A, Mazidi J.G, The 8051 Microcontroller and Embedded Systems, Pearson education Asia, New Delhi (1999), 2nd Edition

UNIT 2

Chapter 2, 3, 4, 5, 6, 8, 9, 11 – Mazidi M.A., Mazidi J.G, The 8051 Microcontroller and Embedded Systems, Pearson education Asia, New Delhi (1999), 2nd Edition

UNIT 3

Chapter 12, 13, 17 – Mazidi M.A., Mazidi J.G., The 8051 Microcontroller and Embedded Systems, Pearson education Asia, New Delhi (1999), 2nd Edition

Chapter 3 – Gadre D.V., Programming and customizing the AVR microcontroller, Tata McGraw Hill, 2nd Edition

UNIT4

Chapter 14- Raj Kamal, Microcontrollers: Architecture, Programming, Interfacing and System Design, Second Edition, Pearson Education India, 2nd Edition

Essential Books:

1. Muhammad Ali Mazidi, Janice GillispieMazidi, The 8051 Microcontroller and Embedded Systems, Pearson education Asia, New Delhi (1999), 2nd Edition
2. D.V. Gadre, Programming and customizing the AVR microcontroller, Tata McGraw Hill, 2nd Edition

3. Raj Kamal Microcontrollers: Architecture, Programming, Interfacing and System Design, 2nd Edition
4. John B. Peatman, Design with PIC Microcontrollers, Pearson Education (1998)

Suggested Books:

1. Daniel W. Lewis, Fundamentals of Embedded Software – where C and Assembly Meet, Pearson Education (2002)
2. Kenneth J Ayala, The 8051 Microcontroller Architecture, Programming and Applications, Penram Publications
3. Zdravko Karakehayov, Knud Smed Christensen and Ole Winther, Introduction by: Embedded Systems Design with 8051 Microcontrollers, Marcel Dekker Inc, (1999)
4. Dave Calcutt, Fred Cowan and Hassan Parchizadeh, 8051 Microcontroller: an application based, Elsevier.
5. Myke Predco, Programming & Customizing the 8051 Microcontroller, McGraw Hill, (2000)
6. Martin Bates, Interfacing PIC Microcontroller Embedded Design by interactive Simulation, Elsevier publication

Practical (based on ELI-DC-I-802)

(Any eight)

1. Write a program to add N 8 bit unsigned integer numbers.
2. Write a program to multiply two 16 bit unsigned numbers.
3. Write a program to arrange the unsigned integer numbers in ascending/descending order.
4. Interface a display to the micro controller and display number sequentially in a regular interval.
5. Write program to verify the switch condition and light the LED's accordingly.
6. Generate a PWM waveform whose width can be increased/decreased using switches.
7. Convert the analog voltage to digital using ADC and store the data in memory.
8. Generate the given waveform using DAC.
9. Using display and keys write program to work as a stop clock.
10. Using display and keys write program to work as a counter.