EE 301: MICROPROCESSORS AND INTERFACING (3-0-2: 4)

Microprocessor System
Introduction, concept of address and data buses, system control signals, basic bus timing, memory (RAM, ROM), memory mapping, input output devices: tri-state devices-buffer, decoder, encoder, and latch.

8085 Microprocessor
Introduction to 8085A, pin description, Architecture, bus timing and instruction timing, demultiplexing of buses, generation of control signals, memory interfacing, interrupts.

8085 I/O Interfacing
Basic interfacing concepts, input/output timing, peripheral I/O interfacing and memory mapped I/O interfacing.

8085 Programming
Instruction set of 8085A, addressing modes, programming, delay, stack and subroutine.

Interfacing Peripherals
Interfacing concepts, data converters – ADC and DAC, 8255 programmable peripheral interface, 8279 programmable keyboard/Display, 8259A programmable interrupt controller, 8254 programmable interval timer.

Introduction to 8086 Microprocessor
8086 internal architecture, address generation, memory segmentation, minimum and maximum mode signal descriptions and basic timing.

Suggested list of Experiments:

1. Familiarization with 8085 register level architecture and trainer kit components including the memory map.
2. Programming using kit/simulator: arithmetical/logical operation on bytes/words, operation on arrays, data transfer, load/store etc.
3. Multiplication and Division of Signed and Unsigned Numbers
4. Arranging of data string.
5. Code conversions.
6. Display programming
7. Program exercises based on delay and subroutines.
8. Program exercises based on 8255 peripheral: identification of pins and ports.
9. ADC interfacing
10. DAC interfacing
11. LCD interfacing
12. Stepper motor interfacing

Text Books

1. R. Gaonker, “Microprocessor Architecture, Programming & Application with 8085”, Penram International.
2. K M Bhurchandi, A K Ray, “Advanced Microprocessors and Peripheral”, Tata McGraw Hill.

References

1. James L. Antonakos, “An introduction to the Intel family of Microprocessors”, Pearson Education.
2. B. Ram, “Fundamentals of Microprocessors and Microcomputers”, Dhanpat Rai.
3. A K. Mukhopadhyay, “Microprocessor, Microcomputer and their Applications”, Narosa Publishing House.
4. N. S. Kumar, M. Saravanan, “Microprocessors and Microcontrollers”, Oxford University Press.
5. D.V. Hall, “Microprocessor & Interfacing”, McGraw Hill.