Microprocessor - Web course

COURSE OUTLINE

The objective of the course is to expose to the students to the architecture and instruction set of typical 8-bit microprocessor. It also deals with Assembly Language Programming using a macro-assembler. Input-output techniques and important programmable support chips used in microprocessor-based systems are discussed in detail.

CONTENTS

General introduction to microprocessor systems; Operation and Control of 8-bit microprocessor; Instruction set; Assembly Language Programming; , I/O Techniques, Interfacing of I/O Devices; Interrupts; Peripheral Devices, Programmable Peripheral Interface (Intel 8255A), Programmable Interval timer (Intel 8253), Programmable Interrupt Controller (Intel 8259A), Programmable Keyboard/Display Interface (Intel 8279).

COURSE DETAIL

S. No.	Topics	No. of Hours
Module-I	**Introduction of Microcomputer System**: CPU, I/O devices, clock, memory, bussed architecture, tristate logic, address bus, data bus and control bus.	**4**
Module-II	**Semiconductor Memories**: Development of semiconductor memory, internal structure and decoding, memory read and write timing diagrams, MROM, ROM, EPROM, EEPROM, DRAM,	**3**
Module-III	**Architecture of 8-bit Microprocessor:** Intel 8085A microprocessor, Pin description and internal architecture.	**5**
Module-IV	**Operation and Control of Microprocessor:** Timing and control unit, op-code fetch machine cycle, memory read/write machine cycles, I/O read/write machine cycles, interrupt acknowledge machine cycle, state-transition diagram.	**5**
Module-V	**Instruction Set:** Addressing modes; Data transfer, arithmetic, logical, branch, stack and machine control groups of instruction set, macro RTL and micro RTL flow chart of few typical instructions; Unspecified flags and instructions.	**6**
Module-VI	**Assembly Language Programming:** Assembler directives, simple examples; Subroutines, parameter	**4**

NP-TEL

NPTEL

http://nptel.ac.in

Electrical Engineering

Pre-requisites:

- **Digital Logic Circuits**

Additional Reading:

1. Intel Manual on 8-bit Processors
2. Intel Manual on Peripheral Devices

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	passing to subroutines.	
Module-VII	**Interfacing:** Interfacing of memory chips, address allocation technique and decoding; Interfacing of I/O devices, LEDs and toggle-switches as examples, memory mapped and isolated I/O structure; Input/Output techniques: CPU initiated unconditional and conditional I/O transfer, device initiated interrupt I/O transfer.	**5**
Module-VIII	**Interrupts:** Interrupt structure of 8085A microprocessor, processing of vectored and non-vectored interrupts, latency time and response time; Handling multiple interrupts	**5**
Module-IX	**Programmable Peripheral Interface:** Intel 8255, pin configuration, internal structure of a port bit, modes of operation, bit SET/RESET feature, programming; ADC and DAC chips and their interfacing.	**4**
Module-X	**Programmable Interval Timer:** Intel 8253, pin configuration, internal block diagram of counter and modes of operation, counter read methods, programming, READ-BACK command of Intel 8254.	**4**
	Total No.Hours	**45**

References:

1. Hall D. V., "Microprocessor and Interfacing-Programming and Hardware", 2nd Ed., Tata McGraw-Hill Publishing Company Limited, 2008.
2. Gaonkar R. S., "Microprocessor Architecture, Programming and Applications", 5th Ed., Penram International, 2007.
3. Stewart J, "Microprocessor Systems- Hardware, Software and Programming", Prentice Hall International Edition,1990
4. Short K. L., "Microprocessors and Programmed Logic", 2nd Ed., Pearson Education, 2008.