

**Amended Course as passed by the Subject Committee Meeting held on Feb. 29, 2004.**

**ELX. 226.3 Microprocessor (3-1-3)**

	<b>Theory</b>	<b>Practical</b>	<b>Total</b>
Sessional	30	20	50
Final	50	-	50
Total	80	20	100

**Course Objectives:**

1. To understand the basic operation, programming and application of microprocessor.
2. To build a foundation for the microprocessor based system design.

- 1. Introduction: (6 hrs)**  
Evolution of microprocessor, Calculator and stored program computer. Von Neumann and Harvard architecture. Description of microprocessor architecture and Applications
- 2. 8 Bit Microprocessor and Programming: (12 hrs)**  
8085 Pin configurations, Functional Architecture of 8085, Register transfer language. Instruction and machine cycle, addressing modes, Direct, indirect, immediate, absolute. Register, stack and implied, RTL description of data transfer instructions, RTL description of logical instruction, RTL description of branching instruction, RTL description of other instruction, fetch and execution cycle. Fetch and execution overlap, timing diagram for register move, indirect read, write and out instruction.
- 3. 16 Microprocessor and Assembly language programming: (15 hrs)**  
Architecture of 16 – bit microprocessor, Registers, Assembly instructions format. Nemonics and operands, Macro Assembler , Linking and assembler directives. Addressing Modes, Int 10h, Int 21 h and functions,
- 4. Bus Structure and Memory Devices: (5 hrs)**  
Bus structure, synchronous and Asynchronous data bus, address bus, bus timing, static and dynamic RAM, ROM. Programmable read only memory (PROM), Electrically programmable memory (EPROM) an electrically erasable and programmable Memory (EEPROM), SRAM and ROM interface requirements.
- 5. Input/ Output Interfaces: (5 hrs)**  
Serial communication, Parallel communication, data transfer wait interface, RS – 232 and IEEE 488 – 1978 general – purpose interface requirements.

6. **Interrupt:** (5hrs)  
Interrupt and vector descriptor table, input service routine requirements, interrupt priority, miscible and non- miscible interrupts, software interrupts, Traps and exceptions, vectored, chained and polled interrupts structures, interrupts in parallel and serial interfaces.
7. **Introduction to advanced Microprocessor architecture** (2 hrs)  
Introduction of RISC and CISC.

**Laboratory Works:**

1. Assembly language program using 8085 microprocessor kit.
2. Program should comprise the use of all types of instructions and addressing modes.
3. The programming should include the concept of Arrays and the concept of Multiplications and Division operations on Microprocessor.
4. Assembly language programming, using any type of Assembler, which should include the different functions of Int, and Int 21h.

**Text Books**

1. 0000 to 8085 Introduction to 8085 microprocessor for Engineers and Scientists. A. K. Gosh, Prentice Hall
2. Assembly language for the IBM PC, Kip Irvine, Maxwell Macmillan

**Reference Books**

1. Microprocessor Architecture, Programming and Application with 8085. Ramesh S. Gaonkar, Penram International.
2. The Intel Microprocessors 8086/8088..... Pentium and Pentium Pro Architecture Programming and Interface, Prentice Hall.