

(EC 354)

MICROPROCESSORS & MICROCONTROLLERS BASE SYSTEM DESIGN

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

UNIT - I

8086/8088 – Architecture and Instruction Set – Addressing modes - Minimum and Maximum mode operations. 8086- control signal interfacing, under Minimum mode system, control signal interfacing under Maximum mode using Multiprocessing Systems. Interrupt structure - vector interrupts.

Assembly Language Programming: Assumbler directives. Use of 8086 Instruction set, Simple program loops using Data transfer, arithmetic, Logical and Branching & ASCII instruction. String processing. Procedures & Stack. Simple programs using DOS functions.

UNIT - II

8086 Interfacing: Memory interfacing using standard RAM , EPROM, EEPROM IC chips, need for DMA and Interfacing with DMA Controller chips (Intel 8237/ 8257 IC^s); Keyboard & display controller (Intel 8279 IC) Interfacing, programmable communication interface – serial and parallel data transmission formats, UART/USART interfacing , intel (8251 IC chip). Interfacing Numeric data processor (Intel 8087), Brief ideas of 16 bit Data Converter’s Interfacing - Programming using standard ADC,DAC Chips.

Unit – III

Introduction & overview of 8/16 Bit Microcontrollers of Intel/Motorola/Micro Chip make controllers. Intel 8051 Architecture on chip features, memory organization & expansion. 8051 instruction set & Addressing modes and Bit addressable features; Interrupt & I/o port structures and their operations. Assembly language Programming with 8051 for simple applications, using Timers, I/o Ports and Serial Port. 8051 serial data communication.

UNIT – IV

Interfacing: Interfacing with external Memory, expansion of I/o ports and A to D & D to A converters. Introduction to Assemblers, brief ideas on debugging tools. Assembly Language programming of 8051. Application programming for data acquisition LCD display modules, real time clock and interrupt base controlling.

UNIT – V

Intel x86 series Microprocessor: Introduction and brief overview of 80286/ Architectural features. Introduction to 80386 Microprocessor – special registers, memory management, protected and virtual modes. Brief overview of 80486 and Pentium Processors – (elementary treatment only).

(.....Contd.)

Suggested Reading:

A: For Microprocessors (Units I,II & V)

1. Douglas V. Hall, *Microprocessors and interfacing programming and Hardware*, Tata McGraw-Hill, 2001.
2. Rector, R., and Alexy, G., *The 8086 Book*, Osborne/McGraw-Hill 1980.
3. Yu-cheng Liu and Glenn A. Gibson, *Micro Computer Systems:8086/8088 family Architecture programming and design*, PHI, India, 2001.
4. Rafiqzaman. M, *Microprocessors Theory and applications Intel and Motorola*, PHI, 2001.
5. Barry B. Brey,*The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386 80486, Pentium, Pentium pro processor, Pentium II, Pentium III, Pentium 4.*, Pearson Education, 2003.

B: For Microcontrollers (Units III & IV)

6. Kenneth J. Ayala, *The 8051 Microcontroller Architecture, Programming and applications*, Penram international, 2001.
7. Muhammad Ali Mzidi, J.G. Mazidi, *The 8051 Micro controller and Embedded Systems*, Pearson Education, 2000.
8. John B. Peatman, *Design with PIC Microcontrollers*, Pearson Education, 2003.
9. Raj Kamal, *Embedded Systems, Architecture, Programming and Design*, Tata McGraw-Hill, 2003.
10. Myke Predko – *Programming and customizing the 8051 microcontroller* . Tata McGraw Hill, 1999.