Microprocessors and Assembly Language Programming (3-1-3)

Evaluation:

	Theory	Practical	Total
Sessional	30	20	50
Final	50	-	50
Total	80	20	100

Course Objectives:

The purpose of the course is to provide the basics fundamentals and operations of microprocessor. It provides knowledge to program microprocessor using assembly language and design microprocessor based systems and interfaces.

Course Contents:

1. Introduction to microprocessor   (3 hrs)
    1.1 Brief description: Microprocessor, Microcontroller, Microcomputer
    1.2 Application of microprocessor
    1.3 Evolution of microprocessor: INTEL series

2. Architectural Details and Instruction set of 8085 and 8086 microprocessor (10 hrs)
    2.1 Internal architecture and description
    2.2 Instruction set
    2.3 Addressing modes
    2.4 Instruction cycle, Machine cycle, t-states
    2.5 Timing Diagram

3. Assembly Language Programming   (12 hrs)
    3.1 Introduction
    3.2 Format of an assembly language instruction
    3.3 Basic assembly language programs of 8085
    3.4 ALP development tools:Editor,Assembler,Linker.Debuger,Locator,Emulator
    3.5 Macro Assembler and Assembler Directives
    3.6 8086 Assembly Language Programs in MASM/TASM
    3.7 Modular Programming
        3.7.1 Linking and Relocation
        3.7.2 Stacks Procedures
        3.7.3 Macros Program Design
        3.7.4 String Manipulation

4. Bus Structure and Memory Devices   (4 hrs)
    4.1 Introduction: Data/Address/Control bus
    4.2 Synchronous and Asynchronous bus
    4.3 Memory Classification
    4.4 Memory Interfacing and Addressing Decoding

5. Interrupt

5.1 Introduction

5.2 Interrupt Sources: Hardware, Software, Processor

5.3 Interrupt Types: Maskable, Non-Maskable Interrupt

5.4 8086 Interrupts

5.5 Interrupt Vector Table

5.6 Vector Chain and Polled Interrupt

5.7 Interrupt Processing

6. Input / Output Interfaces

6.1 Serial I/O standards: 8251A USART

6.2 8259A Programmable Interrupt Controller(PIC)

6.3 8255A Programmable Peripheral Interface(PPI)

6.4 8254 Programmable Interrupt Timer(PIT) and its application

6.5 DMA and DMA controller

Laboratory:
1. A minimum of 10 laboratory exercises shall be done with the use of SDK-85/SDK-86 or equivalent microprocessor trainer kit and Simulators.
2. Numerous assembly language programming exercises are to be done both with the help of microprocessor trainer kit and Macro-Assemblers in PC.

Text Books:
1. Liu. Yu-cheng and Gibson Glenn A., Microprocessor Systems: The 8080 8088 family Architecture. Programming and Design.PHI, 1998. ISBN: 81-203-0409-8
2. Brey. Barry B..Intel Microprocessors.PHI. 1998. ISBN:

References:
1. Antonakos. J. L. An Introduction to the Intel family of microprocessors, 3rd ed. Pearson Education Asia. ISBN: 81-7808-312-4
2. Triebel, Walter A. and Singh Avvbtar, The 8088 and 8086 microprocessors: Programming Interfacing. Software. Hardware, and Applications PHI. 1998, ISBN
3. L.A Leventhal, Introduction to Microprocessor software, Hardware & Programming Prentice Hall of India. Pvt. Ltd., 1995.
4. A.P. Malvino, An Introduction to Microcomputers. Prentice Hall of India. Pvt. Ltd 1995
5. P.K. Ghosh, P.R. Sridhar, 0000 to 8085;Introduction to Microprocessor for Engineers and Scientists, Prentice Hall of India Pvt. Ltd 1997
6. Rajaraman, V. and Radhakrishnan T., Essentials of Assembly Language Programming for the IBM PC, PHI, 1998. ISBN: 81-203-1425-5