B.Sc. Physical Sciences with Physics as one of the Core Disciplines

DISCIPLINE SPECIFIC ELECTIVE COURSE – DSE 7-4 : MICROPROCESSOR

Course Title and Code	Credits	Credit distribution of the course			Pre-requisite of the course
		Lecture	Tutorial	Practical	
Microprocessor DSE 7-4	4	2	0	2	

COURSE OBJECTIVES

Students will be able to outline the types and the functions of storage, learn the characteristics of RAM and ROM and their architecture, describe the architecture of 8085 microprocessors and develop programs for microprocessor 8085

LEARNING OUTCOMES

At the end of the course, students will develop ability to,

- Define storage state the types and functions of storage
- Describe the characteristics of RAM and ROM and their architecture.
- Describe memory organization, addressing, interfacing and mapping
- Describe the architectures of 8085 microprocessors
- Draw timing diagram
- Write programs using 8085

SYLLABUS OF DSE 7-4
THEORY COMPONENT
(Hours: 30)

Unit I **(8 Hours)**

Introduction to 8085 Microprocessor

Introduction to microprocessor: Basic computer system organization, introduction, classification and applications of microprocessors, types of memory-primary memory types (SRAM, DRAM, PROM, EPROM, EEPROM), secondary memory (SSD, Optical Drive) memory organization and addressing

Unit II **(8 Hours)**

Microprocessor 8085 Architecture

Features, architecture-block diagram, general purpose registers, register pairs, flags, stack pointer, program counter, types of buses, multiplexed address and data bus, generation of control signals, pin description of microprocessor 8085, basic memory interfacing concepts, Memory mapped I/O and I/O mapped I/O.

Unit III **(7 Hours)**

8085 Programming

Operation code, operand and mnemonics, instruction set of 8085, instruction classification, addressing modes, instruction format, data transfer instructions, arithmetic instructions, increment & decrement instructions, logical instructions, branch instructions and machine control instructions, subroutine, call and return instructions, timing diagrams-instruction cycle, machine cycle, T- states, basic idea of interrupts

Unit IV **(7 Hours)**

Assembly language programming

Addition with and without carry, subtraction with and without borrow, double addition, multiplication by repeated addition, division by repeated subtraction, block data transfer and checking of parity of a binary number.

PRACTICAL COMPONENT: MICRPROCESSOR
(Hours: 60)

At least six experiments to be performed from the following list:

8085 Assembly language programs

1. Add two 8-bit numbers using Direct and Indirect Addressing Mode
2. Subtract two 8-bit numbers using Direct and Indirect Addressing Mode
3. Multiply two 8-bit numbers with and without subroutine
4. Divide two 8-bit numbers with and without subroutine
5. Add a list of 8-bit numbers
6. Transfer a Block of Data
7. Add two 16-bit numbers with DAD and without DAD
8. Convert byte to Nibble
9. Convert nibble to Byte
10. Check the parity of a given number

REFERENCES

Essential Readings for the Theory Component

1. Microprocessor Architecture Programming and applications with 8085, R. S. Gaonkar, 2002, Prentice Hall
2. Microelectronic Circuits, S. Sedra
3. Fundamentals of Microprocessor and Microcomputer, B. Ram, Dhanpat Rai Publications
4. The Intel Microprocessors - Architecture, Programming and Interfacing, B. Brey, 2003, Pearson Education

Additional Readings for the Theory Component

Microprocessors and Microcontrollers, M. Ali Mazidi, 2006, Pearson

References for the Practical Component

1. Microprocessor Architecture Programming and applications with 8085, R. S. Gaonkar, 2002, Prentice Hall.
2. Microelectronic Circuits, S. Sedra.
3. Fundamentals of Microprocessor and Microcomputer, B. Ram, Dhanpat Rai Publications.
4. Microprocessors and Microcontrollers, M. Ali Mazidi, 2006, Pearson.
5. The Intel Microprocessors - Architecture, Programming and Interfacing, B. Brey, 2003, Pearson Education.