DISCIPLINE SPECIFIC CORE COURSE – 14: Essentials of microprocessor 8085 & 8086 (INDSC5B)

CREDIT DISTRIBUTION, ELIGIBILITY, AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Essentials of microprocessor 8085 & 8086 (INDSC5B)	04	03	-	01	Class XII passed with Physics + Mathematics/Applied Mathematics + Chemistry/ Computer Science/Informatics Practices	Digital Electronics

Learning Objectives

- To understand the general architecture of a microcomputer system
- To comprehend the architecture and organization of 8085 and 8086 microprocessor
- To learn the Interfacing of 8-bit microprocessor with memory and peripheral chips involving system design
- To interpret and classify the instruction set of 8085 microprocessor and distinguish the use of different instructions and apply it in assembly language programming
- To understand difference between RISC and CISC based microprocessors

Learning outcomes

- Describe the general architecture of a microcomputer system
- Understand the architecture and organization of 8085 and 8086 microprocessor
- Learn the Interfacing of 8-bit microprocessor with memory and peripheral chips involving system design
- Interpret and classify the instruction set of 8085 microprocessor and distinguish the use of different instructions and apply it in assembly language programming
- Differentiate between RISC and CISC based microprocessors

- Understand the architecture and operation of Programmable Interface Devices and realize the programming & interfacing of it with 8085 microprocessor

SYLLABUS OF DSC-14

Unit-1 **(15 hours)**

8085 Microprocessor: Introduction to Microprocessor 8085, Pin description of 8085, Architecture, registers of 8085, addressing modes. Instruction Type and Instruction Set, Machine Cycle, Instruction Cycle, Timing Diagram, Memory System, Hardware Interfacing or Types of I/O Addressing-Interfacing Memory and Peripheral (I/o Mapped I/O and memory mapped I/O)

Unit-2 **(10 hours)**

Programming: Assembly Language Programming, Stacks and Subroutine

Interrupts of 8085: Hardware and Software interrupts, Difference between RISC and CISC Processor

Unit-3 **(10 hours)**

Interfacing ICs: Programmable Peripheral Interface: 8255, 8253

Unit-4 **(10 hours)**

Introduction to 8086 Microprocessor: Introduction to microprocessor 8086: Architecture of 8086, Pin Diagram, Physical memory organization, Memory Segmentation (8086), General bus operation, Minimum and Maximum Mode, Addressing modes (8086), Difference between microprocessor and microcontroller.

Practical component: **(30 hours)**

1. To write an assembly language program to perform-addition, subtraction.
2. To write an assembly language program to find count of even numbers/odd numbers from given block of data.
3. To write an assembly language program to find largest/smallest number in given block of data.
4. To write an assembly language program to perform-multiplication, division.
5. To write an assembly language program to convert a number from one number system to another.
6. To perform addition/subtraction by interfacing 8085 with 8255 in simple I/O and polling mode.
7. To generate a square/rectangular wave by interfacing 8253 with 8085.
8. To write an assembly language program to generate first N terms of an A.P. series.
9. To write an assembly language program to generate first N terms of Fibonacci series.
10. To write an assembly language program to arrange the given list of number in ascending / descending order.

Essential/recommended readings

1. Ramesh Gaonkar, Microprocessors architecture, programming and Applications, WileyEastern Ltd. (2013), 6th Edition.
2. P.K Ghosh & P.R Sridhar, 0000 to 8085 microprocessor, John Wiley & Sons, 2nd Edition.
3. Liu Gibson, Microprocessor Systems: The 8086/8088 family Architecture, Programming&Design, PHI, 2015, 2nd Edition.
4. K. Udaya Kumar & B.S. Uma Shankar, The 8085 Microprocessor: Architecture, Programming, and Interfacing", Pearson Education, 1st Edition, 2008.
5. Barry B. Brey and C R Sarma, The Intel Microprocessors 8086/8088, 80186/80188, 80286,80386, 80606, Pearson Education Limited, 8th Edition, 2005.
6. K. M. Bhurchandi, *Advanced Microprocessors & Peripherals*. Tata McGraw-Hill Education, 2013.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.