FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2020-21

Programme: **Bachelor of Engineering (Computer Engineering)**

Semester: **VI**

Course Code: **102045610**

Course Title: **Microprocessor Technologies**

Course Group: **Professional Core Course**

Course Objectives: This course provides the fundamental knowledge of the various aspects of microprocessor-based systems and enables students to understand the basic concepts of 8085 based computing systems. The subject introduces memory and input output peripherals interfacing with 8085 based system. The course is mainly focuses on designing motherboard type systems which consists of various peripherals along with microprocessor.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
Lecture	Tutorial	Practical		Theory		J/V/P*		Total
				Internal	External	Internal	External	
3	0	2	4	40 / 14	60 / 21	20 / 7	30 / 10	150 / 52

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	**Introduction to Microprocessor Based System:** History of microprocessors, Architecture of 8085 microprocessor, pin details and functional block diagram of 8085 microprocessor, 8085 programming model, Address, data and control buses, demultiplexing of buses, generation of control signals, concept of instruction cycle, machine cycle and T state.	08
2	**Memory and I/O Interfacing:** Various types of memories, review of logic devices for interfacing, RAM and ROM interfacing with 8085 based systems, Interfacing input and output devices, memory mapped I/O	07
3	**Instruction Set and Assembly Language Programming:** Classification of instructions, Addressing Modes, 8085 Instruction Set, Instruction And Data Formats, Writing 8085 assembly language programs with decision, making and looping using data transfer, arithmetic, logical and branch instructions, timing diagram of instructions	08

4	**Programming Techniques:** Stack and subroutines, developing timers and time delay routines, code conversion, BCD arithmetic operations, 16 bit data operations	07
5	**Interfacing Peripherals and Applications:** Concepts of Interrupts and interrupt programming, vector interrupts and restart instructions, interfacing of programmable peripheral interface (8255), interfacing of data converters	08
6	**Advanced Microprocessors:** 8086 logical block diagram, segmentation, Minimum and maximum mode, 80286/80386/80486: Overview and architecture, Basic overview of Pentium and Multicore Processors	07
	Total	**45**

List of Practicals / Tutorials:

1	(a) Introduction to Kit and simulator. (b) Demonstration of a simple program.
2	(a) Write a program to add two 16 bit numbers (b) Write a program to subtract two 16 bit numbers
3	(a) Write a program to Find two's complement of number and store the answer in memory (b) Write a program to Calculate the sum of series of numbers.
4	(a) Write a program to multiply two 8 bit numbers. (b) Write a program to divide two 8 bit no and obtain quotient and remainder.
5	(a) Write a program to Arrange the array in ascending order. (b) Write a program to count number of zero, positive and negative numbers from an array.
6	(a) Write a program to find the maximum and minimum number from given numbers. (b) Write a program to Count Number of one's and zero's in a number.
7	(a) Write a program to generate Fibonacci number. (b) Write a program to transfer 16 bytes of data stored at one location to another location
8	(a) Write a program to Generate and display BCD up counter with frequency 1 Hz. (b) Write a program to Generate and display the content of decimal counter.
9	(a) Write a program to convert BCD into equivalent Binary. (b) Write a program to convert BCD into 7 segment code.
10	(a) Write a program for to transfer content from Port B to Port A using 8255. (b) Write a program to generate different lighting pattern connected on Port A using appropriate delay.

Reference Books:

1	Ramesh S. Gaonkar, "Microprocessor Architecture, Programming, and Applications with the 8085", 5th Edition, Penram International
2	Douglas Hall, "Microprocessors and Interfacing", 3rd Edition, McGraw Hill Education
3	Shridhar and Ghosh, "0000 to 8085: Introduction to Microprocessors for Engineers and Scientists", 2nd Edition, Prentice Hall India
4	Barry B. Brey, "The Intel Microprocessors", 8th Edition, Pearson Education India

Supplementary learning Material:	
1	Open source simulator of 8085
2	NPTEL and SWAYAM portal
3	Courses of Microprocessors on Coursera Platform
4	www.intel.com

Pedagogy:
- Direct classroom teaching
- Audio Visual presentations/demonstrations
- Assignments/Quiz
- Continuous assessment
- Interactive methods
- Seminar/Poster Presentation
- Industrial/ Field visits
- Course Projects

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						R: Remembering; U: Understanding; A: Applying; N: Analyzing; E: Evaluating; C: Creating
R	**U**	**A**	**N**	**E**	**C**	
15%	25%	25%	15%	20%	--	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Demonstration of various features of microprocessor-based systems	**15**
CO-2	Identification of architectural features of microprocessors including registers, ALU, Buses, Pin details	**25**
CO-3	Developing assembly language programs based on various instruction set of microprocessors	**20**
CO-4	Design on microcomputer-based system using interfacing of memory and input output peripherals	**25**
CO-5	Demonstration of advance microprocessor-based systems	**15**

Curriculum Revision:	
Version:	1.0
Drafted on (Month-Year):	June-2020
Last Reviewed on (Month-Year):	-
Next Review on (Month-Year):	June-2025