SANKALCHAND PATEL UNIVERSITY
।। अथातो ज्ञानजिज्ञासा ।।

Faculty of Engineering and Technology

Bachelor of Technology

Effective from Academic Year: 2018-19

Branch Name:	Electronics and Communication Engineering
Semester/Year:	Semester V / Third Year
Subject Title:	Microprocessor and Interfacing
Subject Code:	1ET1040503
Pre-requisite:	Students should have in depth knowledge of Digital Logic Design as well as logical ability and programming skills to develop the code

Course Objective:

Microprocessors are being excessively used in the field of automation in every field, so the knowledge of microprocessor is very essential for a student of BE in Electronics and Communication engineering. The students are studying the subject are supposed to learn the architecture and programming of a typical microprocessor. Students also understand the peripheral devices and interfacing it with microprocessor to design a digital system. The course will cover 8085, 8-bit Microprocessor in detail with sufficient exposure to design a digital system. The course will also deal with the architecture of 8086 and introduction to advance microprocessor.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory (Marks)		Practical (Marks)		Total (Marks)
Lecture (L)	Tutorial (T)	Practical (P)	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
04	00	02	05	70	30	30	20	150

Subject Contents			
Sr. No	**Topic**	**Total Hours**	**Weightage (%)**
1	Introduction to 8085 Assembly language programming: 8085 Programming model; Instruction classification; Instruction, Data format and Storage; How to write, assemble and execute a simple program	03	07%
2	Microprocessor Architecture and Microcomputer Systems: Microprocessor Architecture and Operations; Memory, I/O devices, Example of a Microcomputer System	05	10%
3	8085 Microprocessor Architecture and Memory Interfacing: 8085 MPU; Example of a 8085-based Microcomputer; Memory Interfacing	04	10%
4	Interfacing I/O devices: Basic Interfacing Concepts; Interfacing Output Displays, Interfacing Input Devices; Memory Mapped I/O	04	10%

5	Introduction to 8085 instructions: Data transfer operations; Arithmetic operations; Logic operations; branch operations; 8085 assembly language programs with decision making, looping, counting and indexing using data transfer, arithmetic, logical, rotate and branch instructions, 8085 16-bit instructions, 8085 compare instructions	08	10%
6	Counters and Time Delays; Stack & Subroutines; Code Conversion, BCD Arithmetic and 16-Bit Data operations	10	10%
7	8085 Interrupts: 8085 Interrupt; 8085 vectored interrupts; Restart as Software Instructions.	05	10%
8	Interfacing Data Converters; Digital to Analog converts; Analog to Digital Converters.	02	06%
9	Peripherals IC and Applications : Block diagram, Pin description and Interfacing of 8255(PPI) with 8085 Microprocessor; Interfacing of keyboard and seven segment display, Block diagram, Pin description and Interfacing of 8254 PIT with 8085 Microprocessor, Brief description and application of Programmable Interrupt Controller 8259A; 8237 DMA Controller; Basic concepts in serial Input/output and 8251A USART block diagram.	08	15%
10	Extending 8-bit Microprocessor to higher level processors: 16-bit microprocessor (8086); Intel 80386/80486 microprocessor.	03	12%
	Total	52	100%

Course Outcome:

After successful completion of the course students should be able to:

1. Understand the architecture of 8085 8-bit Microprocessor.
2. Describe the importance and function of each pin 8085 Microprocessor.
3. Write, Debug and Simulate assembly language program.
4. Interface Memory, Input/output with 8085 Microprocessor.
5. Summarize the functionality of various peripheral chips.
6. Describe the architecture of 8086 16-bit Microprocessor.
7. List the difference between 8-bit, 16-bit and advance Microprocessor.

List of Text Books:

1. Microprocessor Architecture, Programming, and Applications with the 8085, Ramesh S. Gaonkar Pub: Penram International.

2. The 8051 Microcontroller Architecture Programming and Applications, by Kenneth J Ayala, West Publishing Company

List of Reference Books:

1. Microprocessors and Interfacing, N. Senthil Kumar, M. Saravanan, S. Jeevanathan, S. K. Shah, Oxford
2. Advanced Microprocessors, Daniel Tabak, McGrawHill
3. Microprocessor & Interfacing - Douglas Hall, TMH
4. 8086 Programming and Advance Processor Architecture, Savaliya M. T., WileyIndia
5. The 8088 and 8086 Microprocessors, Triebel & Singh, Pearson Education

List of Suggested titles of Experiments:

- Familiarization with 8085 simulator and trainer kit.
- Verification of assembly language programs using the simulator and trainer kit.
- Development of interfacing circuits for various applications based on 8085.

Design based Problems (DP)/Open Ended Problem:

1. Assembly programs include the concept of Arrays and the concept of Multiplication/Division.
2. Design an 8085 microprocessor based system with 4 KB RAM having a word length of 8-bits with the starting address of 0000H and two 1KB EPROMs having word lengths of 4-bits each with starting address of 8000H.
3. Interface one 4K x 8 RAM and two 8K x 8 ROM with 8085 such that the starting address assigned to each memory chip is 6000H, 8000H and C000H respectively using a 3 x 8 decoder IC.
4. Design an 8085 microprocessor based system with input device connected at I/O mapped address A0h. Three LEDs (common cathode): LED-1(Green) at D0 bit, LED-2 (Yellow) at D3 bit and LED-3 (Red) at D6 bit of the output device connected at I/O mapped address C0h. Write an assembly program to take data from input device,
   Glow LED-1 ; if data <=50H
   LED-2 ; if 50H >data<=A0H
   LED-3; if data>A0H.
   Take data from input device at every 10 ms time.
5. Design a digital system to display token number on a seven-segment displays (common anode) of Port-A and switch connected to Port-C of 8255 PPI. Display 1, 2, 3……9,0 and repeat as switch is pressed.
6. Interface stepper motor with 8085 microprocessor using 8255, rotate it counterclockwise.
7. Design a digital system to monitor room temperature using ADC connected with 8255.
8. Design a digital clock using 6 seven-segment displays (common cathode) using 8255 PPI and 8253 PIT (to generate time delay).

e-Resources:

1. Open source simulator for 8085 processor
2. www.nptel.ac.in