

Branch Name:	Computer Engineering / Information Technology
Program Code:	ET404 / ET407
Course Title:	Microprocessor
Course Code:	2ET4040305
Pre-requisite Course:	--

Course Objectives:

This course introduces to Engineering Graduates the Microprocessor and its Assembly Language programming. The course is designed based on the popular Intel 8086 microprocessor and provides good understanding of the microprocessor operation at the address, data, and control level. The course also covers the software part through teaching of assembly language programming techniques. Microprocessor Interface hardware and support chips are also examined in detail.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	0	2	4	60	40	20	30	150

Course Contents:

Unit No	Topic	Total Hours	Weightage (%)
Unit – I	Introduction of Microprocessor: 1.1 Evolution of microprocessor and its types 1.2 Microprocessor Bus organization: Data Bus, Address Bus and Control Bus 1.3 Operations of microprocessor: internal data manipulation, microprocessor initiated and peripheral or external initiated 1.4 Pin diagram and block diagram of 8085 1.5 Architecture of 8085 Internal registers organization of 8085 1.6 Limitations of 8085	06	20
Unit – II	Instruction Cycle and Timing Diagram: 2.1 8085 machine cycle and bus timings to fetch, decode and execute instruction from memory 2.2 Memory read and write 2.3 Input/output read and write cycle with timing diagram	04	20
Unit – III	8085 Instruction set: 3.1 Machine language instruction format: Single byte, two-byte, three byte 3.2 instructions various addressing modes 3.3 Data transfer operation and instruction, Arithmetic operation and instruction, Logical operation and instruction, Branch operation and instruction, Stack operation and instruction 3.4 Input/output and machine control operation and instruction 3.5 Simple programs with 8085 instructions	12	20
Unit- IV	Programming Techniques of 8085: 4.1 Looping 4.2 Counting and indexing 4.3 Counter and Timing delays 4.4 Stack and subroutine 4.5 Basic concepts of Procedure and macro	08	20

Unit-V	8085 Interrupts: 5.1 Interrupts and its need 5.2 classification of interrupts 5.3 8085 interrupts: software, hard ware, and priorities of interrupts 5.4 8085 vectored interrupts: TRAP, INTR 5.5 RST 7.5, RST 6.5, RST 5.5	04	10
Unit-VI	Introduction to Advanced Microprocessor: 6.1 Block diagram - Architecture of 8086 6.2 Register organization of 8086 6.3 Concepts of Instruction pipelining 6.4 Memory segmentation 6.5 Memory address generation 6.6 Minimum and Maximum mode operation and diagram	08	10

Text Books:

Reference Books:

Sr.No.	Title of Book	Author
1.	8085 Microprocessor and its application	Kani, A. Nagoor (Mc Graw Hill)
2.	Microprocessor & Interfacing Programming and hardware Revised second edition	Hall, Douglas (Tata Mc Graw Hill)
3.	Microprocessor Architecture, Programming, and Application with the 8085 (5th edition)	Gaonkar, Ramesh

List of Open-Source Software/learning website:

<https://en.wikipedia.org/wiki/Microprocessor>

<https://www.tutorialspoint.com/microprocessor/index.htm>

<https://darshan.ac.in/gtu-study-material/3160712-Microprocessor-and-Interfacing>

<https://www.geeksforgeeks.org/microprocessor-tutorials/>

Course Learning Outcomes (CLO):

After Completion of this course the students will be able to:

1. Describe the general architecture of a microcomputer system and architecture & organization of 8085 & 8086 Microprocessor and understand the difference between 8085 and advanced microprocessor.
2. Understand and realize the Interfacing of memory & various I/O devices with 8085 Microprocessor.
3. Understand and classify the instruction set of 8085 microprocessor and distinguish the Use of different instructions and apply it in assembly language programming.
4. Understand the architecture and operation of Programmable Interface Devices and realize the Programming & interfacing of it with 8085 microprocessors.

LIST OF PRACTICAL:

1. Demonstrate of kit/simulator of 8085
2. Implement program to perform arithmetic operations (Add, subtract, multiply and divide) on signed and unsigned two 8-bit numbers.
3. Implement a program to mask the lower four bits of content of the memory location.
4. Implement a program to set higher four bits of content of the memory location to 1.
5. Implement a program to perform Exclusive OR of two numbers.
6. Implement a program to exchange the content of two memory locations.
7. Implement program to add/subtract 16-bit numbers.
8. Implement program to copy content of one memory location to another memory location.
9. Implement a program to check whether given no is odd or even.
10. Implement a program to compare two numbers.
11. Implement a program to sum integers from 0 to 9.
12. Implement a program to count no of zero value in given block of data.
13. Implement program to add an array of data.
14. Implement program to find the smallest and the largest number from an array of n number.
15. Implement a program to move/copy block of memory to another given location and length Of block is given in specific memory location.
16. Implement a program to calculate the length of a string given starting and ending location.
17. Implement a program to reverse a string using stack operations and stored in same memory area.
18. Implement a program to find minimum and maximum from block data using subroutine provided length of block stored at memory location.
19. Implement program to count no of negative values in given block of data.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	H	H	M	L										H		
CLO2	H	M	M											M		
CLO3	M	M	L	M										M		
CLO4	M	M	L											L		
CLO5																
CLO6																

H: High, M: Medium, L: Low