

CO 2	✓			✓
CO 3	✓		✓	✓
CO 4		✓	✓	✓

## 12. BASICS OF MICROPROCESSORS

Discipline	Computer Science				
Course Code	UK1MDCCSC102				
Course Title	BASICS OF MICROPROCESSORS				
Type of Course	MDC				
Semester	I				
Academic Level	1 .				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week
	3	2 hours	-	2 hours	4 hours
Pre-requisites	Knowledge on number systems - Binary and Hexadecimal				
Course Summary	This Course covers the architecture and operations of 8085 and 8086 microprocessors, focusing on their instruction cycles, system buses, and binary/hexadecimal data handling. It details the pin functions and instruction sets, emphasising assembly language programming skills. Students will also learn about assembler commands and TASM programming for the 8086.				

### Detailed Syllabus:

Module	Unit	Content	Hrs (L+P)
<b>I</b>	<b>Introduction to 8085</b>		
	1	Introduction to microprocessors	12

	2	8085 Architecture		
	3	Buses and demultiplexing of buses, Instruction set		
	4	Addressing modes (8085)		
<b>II</b>	<b>Pins, signals and Instruction Cycle</b>		<b>12</b>	
	5	Pin Diagram and Signals		
	6	Fetch, Decode and Execute cycles		
	7	Instruction Cycle - Timing diagram		
<b>III</b>	<b>Introduction to 8086</b>		<b>12</b>	
	8	8086 Architecture		
	9	Flag register and its functions (8086)		
	10	Instruction set of 8086		
	11	Addressing modes		
	<b>8086 -Fetch, Decode and Execute cycles</b>			
	12	Instruction Cycle		
	13	Buses and Demultiplexing of Buses		
	14	8086 Memory banks (Even bank, Odd Bank)		
	<b>Assembly Language Programming</b>			
<b>IV</b>	15	Program Development Tools	<b>12</b>	
	16	Assembler Directives		
	17	Introduction to TASM programs-8086		
	<b>Flexi Module: Not included for End-Semester Exams</b>			
<b>V</b>	18	Comparison between 8085 and 8086 microprocessors,	<b>12</b>	
	19	Discuss the applications of the 8086 microprocessors.		

## **TEXT BOOKS**

1. Ramesh S Gaonkar, Microprocessor Architecture, Programming, and Applications with the 8086 .
2. Ramesh S. Gaonkar, Microprocessor Architecture, Programming and Applications with the 8085, 1st edition.
3. Nagoor Kani A, 8085 Microprocessor and Applications, 4th edition.
4. N. Mathivanan, Microprocessors, PC Hardware and Interfacing, PHI Edition, Publisher: PHI.

## **REFERENCES**

1. B. Ram, Fundamentals of Microprocessors and Microcontrollers, 1st edition, Dhanpat Rai Publications, 2018.
2. A Nagoor Kani, 8086 Microprocessor and its applications, 2nd edition, McGraw Hill, 2017
3. John D Carpinelli, Computer system organisation and architecture, Pearson Education, 2002

## **Web Resources**

1. [https://www.youtube.com/playlist?list=PLgwJf8NK-2e5vHwmowy\\_kGtjq9Ih0FzwN](https://www.youtube.com/playlist?list=PLgwJf8NK-2e5vHwmowy_kGtjq9Ih0FzwN)
2. <https://www.javatpoint.com/instruction-set-of-8085>
3. <https://www.geeksforgeeks.org/architecture-of-8086/>
4. [https://en.wikipedia.org/wiki/Intel\\_8086](https://en.wikipedia.org/wiki/Intel_8086)

## **LAB EXERCISES (ANY 10 EXPERIMENTS)**

### **PART A (8085 EXPERIMENTS)**

1. Basic Arithmetic Operations (Addition, Subtraction, Multiplication, Division)
2. Program to find factorial a number
3. Program to find out the largest among N numbers

### **PART B (TASM PROGRAMS-8086)**

1. Basic Arithmetic Operations (Addition, Subtraction, Multiplication, Division)
2. Program to find the sum of numbers in an array
3. Program to search a number in an array
4. Program to find out the Smallest among N numbers

### **Course Outcomes**

No.	Upon completion of the course the graduate will be able to	Cognitive Level	PSO addressed
CO-1	Demonstrate the basic architecture and Instruction set of 8085 microprocessor.	Ap	PSO-1, 3
CO-2	Use 8085 Instruction set, Learn Fetch, Decode, Execute operations and timing diagrams.	Ap	PSO-1, 3
CO-3	Illustrate 8086 architecture, instruction set and the timing diagram for 8086 microprocessors.	Ap	PSO-1, 3
CO-4	Develop Assembly Language Programs	Ap	PSO-1, 2, 3

**R-Remember, U-Understand, Ap-Apply, An-Analyse, E-Evaluate, C-Create**

*Note: 1 or 2 COs/module*

**Name of the Course: BASICS OF MICROPROCESSORS**

**Credits: 2:0:1 (Lecture: Tutorial: Practical)**

CO No.	CO	PO/PSO	Cognitive Level	Knowledge Category	Lecture (L)/Tutorial (T)	Practical (P)
CO-1	Demonstrate the basic architecture and Instruction set of 8085 microprocessor	PSO - 1, 3 PO-1, 2, 6, 7	Ap	F, C	L	P
CO-2	Use 8085 Instruction set, Learn Fetch, Decode, Execute operations and timing diagrams	PSO - 1, 2, 3 PO – 1, 2, 6, 7	Ap	F, C, P	L	P

CO-3	Illustrate 8086 architecture, instruction set and the timing diagram for 8086 microprocessors.	PSO - 1,2, 3 PO – 1, 2, 6, 7	Ap	F, C, P	L	P
CO-4	Develop Assembly Language Programs	PSO - 2, 3 PO – 1, 2, 6, 7	Ap	F, C, P	L	P

**F-Factual, C- Conceptual, P-Procedural, M-Metacognitive**

#### Mapping of COs with PSOs and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO 1	1	1	-	-	-	1	1	-	2	1	2	-
CO 2	1	1	-	-	-	1	1	-	2	1	2	-
CO 3	1	1	-	-	-	1	1	-	2	1	2	-
CO 4	2	2	-	-	-	1	2	-	2	1	2	-

**Correlation Levels:**

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

**Assessment Rubrics:**

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments
- Final Exam

**Mapping of COs to Assessment Rubrics:**

	Internal Exam	Assignment	Lab Assessment	End Semester Examinations
CO 1		✓		✓
CO 2	✓			✓
CO 3	✓	✓		✓
CO 4		✓	✓	✓