

GOVERNMENT POLYTECHNIC, NAGPUR
(An Autonomous Institute of Government of Maharashtra)
(CURRICULUM DEVELOPMENT CELL)

CURRICULUM

PROGRAMME : **DIPLOMA IN INFORMATION TECHNOLOGY**
COURSE CODE : **EC6408**
NAME OF COURSE : **MICROPROCESSOR**
NAME OF LEVEL : **BASIC TECHNOLOGY COURSES**
TOTAL CREDITS : 06 **THEORY : 04** **PRACTICAL :02**
EXAMINATION SCHEME :

MARKS	THEORY			PRACTICAL			TOTAL
	TERM EXAM	PROGRESSIVE TEST	TOTAL	PRACT - EXAM	TERM WORK	ORAL EXAM	
MAX	75	25	100	--	25	25	150
MIN	30	--	40	--	10	10	60

PREREQUISITE COURSE / COURSES TO BE COMPLETED : **EC6201**
TIME ALLOTTED FOR TERM EXAM : **3 HOURS**
TIME ALLOTTED FOR PROGRESSIVE TEST : **1 HOURS**

• **RATIONALE :-**

Microprocessor is exciting and challenging, and the field is growing. To meet the challenges of this growing technology, students should be well conversant with microprocessor and its programming language. Along with microprocessor, supporting chips are used to provide actual applications of the microprocessor

• **SKILLS :-**

- 1) Know the memory organization, the different microprocessor architecture, memory map and I / O map concept
- 2) Recognize the function of various pins of the 8085 microprocessor, timing diagram of the 8085 microprocessor, different types of instructions, addressing modes of the 8085 microprocessor.
- 3) Know the interfacing chips and interrupt system.

• **OBJECTIVES :-**

After completing this course, students will be able to

- 1) Know the memory organization, the different microprocessor architecture, memory map and I / O map concept
- 2) Recognize the function of various pins of the 8085 microprocessor, timing diagram of the 8085 microprocessor, different types of instructions, addressing modes of the 8085 microprocessor.
- 3) Write the small programs in 8085 assembly language.
- 4) Aware of microprocessor supporting chips (Peripherals).

• **PROVISION OF LEARNING EXPERIENCES**

A) THEORY :-

1. INTRODUCTION TO MICROPROCESSOR : (H-02, M-02)

What is microprocessor, Computer organization, Random access memory, Read only memory, Programmable read only memory, Erasable programmable read only memory, Evolution of microprocessor.

2. 8085 MICROPROCESSOR: (H-08, M-10)

8085 Pin out diagram, Address bus, multiplexed Address / Data bus, Control and status signals. Power supply and clock frequency. Interrupts, Serial Data, DMA, A Detailed look at 8085 Architecture. Flags, memory, Accumulator, Different registers. Bus contention, Separation of control signals.

3. INSTRUCTIONS OF 8085 MICROPROCESSOR: (H-09, M-10)

Instruction classification based on no. of bytes, Instruction classification based on operation: data transfer instruction, arithmetic instructions, logical instruction, branching instructions, Rotate instruction. Instruction format Different addressing modes of 8085 microprocessor.

4. TIMING ANALYSIS OF MICROPROCESSOR 8085 : (H-10, M-08)

Basic concept, Instruction cycle, M/C cycle, T- States, Opcode fetch m/c, Read m/c, Write m/c, M/C cycles of MVI r, DATA, LXI rp , ADDR instruction

5. 8085 MICROPROCESSOR PROGRAMMING: (H-10, M-12)

Problem statement, problem analysis, flow chart, programming and documentation. Debugging a program. Small programs such as addition and subtraction of two numbers. Simple input and output programs. Data transfer from memory to memory.

- 6. STACK & SUBROUTINE :** (H-07, M-05)
Concept of stack memory, Push and Pop instruction, Subroutine, Nested subroutine, conditional and unconditional Call , Return, conditional return, Simple program for delay subroutine.
- 7. 8085 INTERRUPT SYSTEM :** (H-03, M-06)
The 8085 Interrupt, 8085 Vectored Interrupts, restart as Software Instructions, Compare between Hardware & Software interrupt.
- 8. PERIPHERALS :** (H-09, M-12)
Study of the following peripheral chips including block diagram and different modes of operation only(In brief)- 8155, 8255, 8251, 8253, 8257, 8259, 8279 (No PIN diagram, interfacing and its programming).
- 9. MICROPROCESSOR 8086:** (H-06, M-10)
Introduction to 16 bit Microprocessor -8086,their architecture,instruction set, Features of the 8086, Simple programs like sum the numbers from 1 to 100, find negative number from series of numbers, find maximum number in a given series of data, multiplication using MUL, division using DIV.Introduction to 32-bit Intel microprocessor – 386, 486 and 586(No block diagram and programming).

B) LABORATORY /FIELD EXPERIENCES

• List of Laboratory/Field experiences

- 1) Addition of two numbers.
- 2) Subtraction of two numbers.
- 3) Multiplication of two numbers.
- 4) Find the largest number among the set of numbers.
- 5) Find the smallest numbers among the set of numbers.
- 6) Find the number of ones from given number.
- 7) Program on logical instruction..
- 8) & 9) Flow chart for time delay along with program and delay calculation. (delay routing) for two delays say 20 ms and 80 ms.
- 10) Write a small program to clear the memory locations.
- 11) Load the register pairs with data and PUSH the content of the register on the stack.

- 12) Calculation of the delay for the given program with given clock period frequency.
- 13) Use of 8255 as PPI.
- 14) Use of 8253 to generate square wave.
- 15) Use of 8085 interrupt facility.
- 16) Multiplication of 16 bit numbers.
- 17) Division of 16 bit numbers

C) INDUSTRIAL / FIELD TRAINING

NIL

D) INDUSTRIAL VISITS

NIL

E) STUDENT'S PROJECTS

Microprocessor based traffic control system.

Microprocessor based stepper motor control

- **INSTRUCTIONAL STRATEGIES TO BE ADOPTED**

- Lecture method
- Improved Lecture Method
- Question - Answer Technique.

- **LEARNING RESOURCES TO BE USED.**

- **PRINT** ----- Text Books / Reference Books
- **NON PRINT** ----- Transparencies / Slides/ etc.

- **REFERENCES :**

1. Microprocessor architecture, programming, and applications ---- R. S. Gaonkar.
2. Microprocessor & Micro controller --- B. P. Singh
3. Fundamentals of microprocessors and microcomputer --- B. RAM
4. 8085 Microprocessor & its applications --- Bhupendra Singh Chabra.