Ramgarhia Polytechnic College, Phagwara

Computer Science Engineering Department

Head of Department: Er. Poonam Rana

Name of the Faulty: Er. Gaganpreet Singh

Discipline: CSE Department

Semester: 5TH

Subject: MICROPROCESSOR

Lesson Plan Duration: 16 Weeks

RATIONALE

In the real world of work, the technician is required to handle wide variety of instruments while testing, trouble shooting, calibration etc. The study of this subject will help students to gain the knowledge of working principles and operation of different instruments. During practical sessions, he will acquire the requisite skills.

LEARNING OUTCOMES

After undergoing the subject, student will be able to:

CO1. Write, edit a machine language program using mnemonics

CO2. Describe all the internal parts and pins of 8085 and 8086

CO3. Write, execute and debug assembly language programs for simple applications.

.

CO4. Interface various peripheral devices with microprocessor.

CO5. Use various data transfer techniques used in microcomputers.

PO ⇨ / CO ⇩	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1			●				
CO2	●						●
CO3			●				
CO4				●			●
CO5			●				●

Syllabus

Units	Details	Hours
1.	Evolution of Microprocessor (3 hrs) - Typical organization of a microcomputer and functions of its various blocks - Microprocessor, its evolution, function and impact on modern society	(03 hrs)
2.	Architecture of a Microprocessor (With reference to 8085 microprocessor) (8 hrs) - Concept of Bus, bus organization of 8085 - Functional block diagram of 8085 and function of each block - Pin details of 8085 and related signals - De-multiplexing of address/data bus of read/write control signals - Steps to execute a stored programme	(08 hrs)
3.	Memories and I/O interfacing (8 hrs) - Basic RAM Cell, N X M bit RAM, Expansion of word length and capacity, static and dynamic RAM, basic idea of ROM, PROM, EPROM and EEPROM - Memory organization, Concept of memory mapping, partitioning of total memory space, Address decoding, concept of I/O, mapped I/O and memory mapped I/O, interfacing of memory mapped I/O devices - Concept of stack and its function	(08 hrs)
4.	Programming (with respect to 8085 microprocessor) (14 hrs) - Brief idea of machine and assembly languages, Machines and Mnemonic codes - Instruction format and addressing modes, identification of instructions as to which addressing mode these belong - Concept of instruction set, Explanation of the instructions of the following groups of instruction set Data transfer groups, arithmetic group, logic group, stack, I/O and	(14 hrs)

	machine control group - Programming exercises in assembly language. (Examples can be taken from the list of experiments) - Serial data transfer using RIM and SIM instructions	
5.	Instruction Timing and Cycles - Instruction cycle, machine cycle and T-states - Fetch and execute cycle	(03 hrs)
6.	Interrupts (4 hrs) - Concept of interrupt - Maskable and non-maskable interrupts - Edge triggered and level triggered interrupts - Software interrupts - Restart interrupts and its use - Various hardware interrupts of 8085 - Servicing interrupts, extending interrupt system	(04 hrs)
7.	Peripheral devices - 8255 PPI and 8253 PIT - 8257 DMA controller - 8279 Programmable KB/Display Interface - 8251 Communication Interface Adapter - 8155/8156	(08 hrs)
8.	Architecture of 8086 Microprocessor - Internal Architecture of 8086. - Concept of memory segmentation and physical address generation. - Memory and date addressing mode - Minimum and Maximum mode of 8086	(08 hrs)
9.	Instruction sets of 8086 - Instruction Format. - Data transfer. - Arithmetic - Bit and logical manipulation - String - Program transfer and processor control instructions - Assembler and assembler directives	(08 hrs)

Reference Books:

1. Microprocessor Architecture, Programming and Applications with 8080/8085 by Ramesh S Goanker, Willey Eastern Ltd, New Delhi
2. Introduction to Microprocessor by Mathur, Tata McGraw Hill Education Pvt. Ltd. New Delhi
3. Advanced Microprocessor and Interfacing by Badri Ram, Tata McGraw Hill Education Pvt. Ltd. New Delhi
4. Microprocessor and Application by D.V. Hall; McGraw Hill Book Co. New Delhi
5. Microprocessor 8086/88 by B.B. Brey; Pearson Education, New Delhi
6. Microprocessor and Applications by B Ram; McGraw Hill Book Co. New Delhi

Delivery/Instructional Methodologies

Sr.No.	Description
1.	Chalk and Talk
2.	PowerPoint Presentation

Assessment Methodologies

Sr. No.	Description	Type
1.	Student Assignment	Direct
2.	Test	Direct
3.	Board Examination	Direct
4.	Student Feedback	Direct

Gaps in the syllabus - to meet industry/profession requirements

S.NO.	DESCRIPTION	PROPOSED ACTIONS	PO MAPPING
	N/A	N/A	N/A

Topics beyond syllabus/advanced topics

Units	Details	Hours
N/A	N/A	N/A

Web Source References

Sr. No.	URL
1.	https://nptel.ac.in/

Lesson Plan

Week	Theory		Practical	
	Lecture Day		Practical Day	
1st	1st	Evolution of Microprocessor Typical organization of a microcomputer and functions of its various blocks	**1**.	Familiarization of different keys of 8085 microprocessor kit and its memory map.
	2nd	Microprocessor, its evolution, function and impact on modern society		
	3rd	Architecture of a Microprocessor Concept of Bus, bus organization of 8085		
	4th	Functional block diagram of 8085 and function of each block		
2nd	5th	Pin details of 8085 and related signals	**2**.	Steps to enter, modify data/program and to execute a programme on 8085 kit.
	6th	De-multiplexing of address/data bus of read/write control signals		
	7th	Steps to execute a stored programme		
	8th	Memories and I/O interfacing - Basic RAM Cell, N X M bit RAM, Expansion of word length and capacity,		

		static and dynamic RAM, basic idea of ROM, PROM, EPROM and EEPROM		
3rd	9th	- Basic RAM Cell, N X M bit RAM, Expansion of word length and capacity, static and dynamic RAM, basic idea of ROM, PROM, EPROM and EEPROM	**3.**	Execution of ALP on 8085 kit for addition/subtraction of two 8 bit numbers.
	10th	Memory organization, Concept of memory mapping, partitioning of total memory space,		
	11th	Address decoding, concept of I/O, mapped I/O and memory mapped I/O,		
	12th	interfacing of memory mapped I/O devices		
4th	13th	Concept of stack and its function	**4.**	Execution of ALP on 8085 kit for Multiplication/Division of two 8 bit numbers.
	14th	Brief idea of machine and assembly languages, Machines and Mnemonic codes		
	15th	Instruction format and addressing modes,		
	16th	identification of instructions as to which addressing mode these belong		
	17th	Concept of instruction set	**5.**	Execution of ALP on
		Explanation of the instructions of the		

5th	18th	followinggroups of instruction set		8085 kit for arranging 10 numbers in ascending/descending order.
	19th	Data transfer groups, arithmetic group, logic group, stack, I/O and machine control group		
	20th	Data transfer groups, arithmetic group, logic group, stack, I/O and machine control group		
6th	21st	Programming exercises in assembly language.	**6.**	Execution of ALP on 8085 kit for 0 to 9 BCD counters (up/down counteraccording to choice stored in memory).
	22nd	Serial data transfer using RIM and SIM instructions		
	23rd	**REVISION**		
	24th	**REVISION**		
7th	25th	**1st HOUSE TEST (TENTATIVE)**	**7.**	Interfacing exercise on 8255 like LED display control.
	26th	**PTM**		
	27th	Instruction cycle, machine cycle and T-states		
	28th	Instruction cycle, machine cycle and T-states		

8th	29th	Fetch and execute cycle	**8.**	Demonstration of different keys of 8086-microprocessor kit and its memory map.
	30th	Interrupts Concept of interrupt		
	31st	Maskable and non-maskable interrupts		
	32nd	Edge triggered and level triggered interrupts		
9th	33rd	Software interrupts	**9.**	Execution of steps to enter, check /modify data or program and to execute aprogram on 8086 microprocessor kit.
	34th	Restart interrupts and its use		
	35th	Various hardware interrupts of 8085 - Servicing interrupts		
	36th	extending interrupt system		
10th	37th	REVISION	**10.**	Execution of ALP on 8086 kit for addition/subtraction of two 16 bit numbers(signed and unsigned).
	38th	REVISION		
	39th	2nd HOUSE TEST (TENTATIVE)		
	40th	**PTM**		

11th	41st	Peripheral devices -8255 PPI	**11.**	Execution of ALP on 8086 kit for Multiplication/Division of two igned/unsignednumbers.
	42nd	8253 PIT		
	43rd	8257 DMA controller		
	44th	8279 Programmable KB/Display Interface		
12th	45th	8251 Communication Interface Adapter	**12.**	**Revision**
	46th	8155		
	47th	8156		
	48th	Internal Architecture of 8086.		
13th	49th	Concept of memory segmentation.	**13.**	**Revision**
	50th	Concept of physical address generation.		
	51st	Memory addressing mode		
	52nd	Date addressing mode		
	53rd	Minimum and Maximum mode of 8086		

14th	54th	Introduction To Instruction sets of 8086	**14.**	**Revision**
	55th	REVISION		
	56th	Instruction Format.		
15th	57th	Arithmetic Instructions.	**15.**	**Revision**
	58th	Bit and logical manipulation		
	59th	String		
	60th	Program transfer and processor control instructions		
16th	61st	Assembler and assembler directives	**16.**	**Revision**
	62nd	**REVISION**		
	63rd	**REVISION**		
	64th	**3rd House Test (TENTATIVE)**		

NBA has defined the following seven POs for an Engineering diploma graduate:

i) **Basic and Discipline specific knowledge**: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

ii) **Problem analysis:** Identify and analyze well-defined engineering problems using codified standard methods.

iii**)** **Design/ development of solutions**: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.

iv) **Engineering Tools, Experimentation and Testing**: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.

v) **Engineering practices for society, sustainability and environment**: Apply appropriate technology in context of society, sustainability, environment and ethical practices.

vi) **Project Management**: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.

vii) **Life-long learning**: Ability to analyze individual needs and engage in updating in the context of technological changes.

Program Specific Outcomes (PSOs)

PSOs are a statement that describes what students are expected to know and be able to do in a specialized area of discipline upon graduation from a program. Program may specify 2-4 program specific outcomes, if required.

These are the statements, which are specific to the particular 11 program. They are beyond POs. Program Curriculum and other activities during the program must help in the achievement of PSOs along with POs.