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| | **DPG Institute of Technology and Management**<br><br>**Sector 34, Gurugram HR 122004** |
| | **Lesson Plan** |
| | **Course Name: Microprocessor** |
| | **Faculty Name: Dr. Sonu Rana** |

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| **No. of Lectures Hours/Week** | **3** | **Exam Hours** | **3** |
| **Total No of lectures** | **38** | **Exam Marks** | **75** |
| **Course Code** | **ESC-CSE-301G** | | |

Course Objectives:

- To make understand architecture and working of Intel 8085 microprocessor in depth.
- To make understand architecture and working of Intel 8086 microprocessor in depth.
- Familiarization with the assembly language programming.
- Familiarization with various peripheral operations

| Lecture No. | Topics to be Covered | Teaching Methodology/Pedagogy | Class Activity | Remarks |
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| **Section-A, Unit-1, CO- C301.1** | | | | |
| 1 | Subject Introduction | Simple talk with applications | Group discussion on uses | |
| 2 | Introduction to microprocessor | Easy examples | Q&A session | |
| 3 | Block diagram of 8085 microprocessor | Diagram explanation | Students draw diagram | |
| 4 | Architecture 8085 | Step-by-step diagram | Label each block | |

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| 5 | Instruction set 8085 | **Diagram on black board** | Classify instructions | |
| 6 | Interrupt structure | Labeled diagram | Students calculated Address | |
| 7 | Addressing Modes 8085 | Board work with examples | Solve simple problems | |
| 8 | Assembly language programming | Step-by-step method | Write small program | |
| 9 | Test | Quiz/discussion | Worksheet activity | |
| **Section-B, Unit-2, CO- C301.2** | | | | |
| 10 | Introduction 8086 | Compare with 8085 | Group discussion | |
| 11 | Architecture and Block diagram of 8086 | Diagram explanation | Students draw diagram | |
| 12 | Details of sub-blocks such as EU, BIU; | Explain with examples | Identify functions | |
| 13 | Memory segmentation and physical address computations, | Board explanation | Solve numerical example | |
| 14 | Program relocation, addressing modes | **Discussion** | Write small program | |
| 15 | Instruction formats | Block diagram | Label instruction fields | |
| 16 | 8086 pin diagram | Chart-based explanation | Label pins | |
| 17 | Description of various signals | Diagram explanation | Identify and describe | |
| 18 | Program of 8086 | Step-by-step coding | Solve examples | |

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| 19 | Test | Quiz session | Practice sheet | |
| **Section-C, Unit-3, CO- C301.3** | | | | |
| 20 | Instruction execution timing directives | Step explanation | Draw timing diagram | |
| 21 | Assembler instruction format | Timeline method | Identify fields | |
| 22 | Data transfer instructions | Table explanation | Write sample programs | |
| 23 | Arithmetic instructions | Board examples | Solve sums | |
| 24 | Branch instructions | Diagram explanation | Write branch programs | |
| 25 | Looping instructions | Real-life examples | Write loop programs | |
| 26 | NOP and HLT instructions, flag manipulation instructions | Simple chart | Discuss pros/cons | |
| 27 | logical instructions, shift and rotate instructions | Diagram & examples | Solve small problems | |
| 28 | Operators | **Discuss all operators on Black board** | | |
| 29 | Programming examples | Step-by-step coding | Debug sample program | |
| 30 | Test | Quiz/test | Worksheet | |
| **Section-D, Unit-4, CO- C301.4** | | | | |

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| 31 | 8255 Programmable peripheral interfaces | Diagram and case study | Draw block diagram | |
| 32 | Interfacing with keyboard | **Discuss Examples** | | |
| 33 | And seven segment display | **Diagram on Blak board** | | |
| 34 | 8254 (8253) programmable interval timer | Diagram explanation | Draw timer diagram | |
| 35 | 8259A programmable interrupt controller | Compare with 8086 interrupts | | |
| 36 | Direct Memory Access 8237 DMA controller. | Use-case explanation | Discuss applications | |
| 37 | Pin diagram of DMA and other registers | Black board diagram | | |
| 38 | Test | Class Test | Question practice | |

TEXT BOOKS:

1.Microprocessor Architecture, Programming & Applications with 8085: Ramesh S Gaonkar; Wiley Eastern Ltd.

2. Intel Microprocessors 8086- Pentium processor: Brey; PHI

REFERENCE BOOKS:

1. Microprocessors and interfacing: D V Hall; TMH

2. The 8088 & 8086 Microprocessors-Programming, interfacing, Hardware & Applications: Triebel & Singh; PHI

3. Microcomputer systems: the 8086/8088 Family: architecture, Programming &Design: Yu-Chang Liu & Glenn A Gibson; PHI.

4. Advanced Microprocessors and Interfacing: Badri Ram; TMH

**Course Outcomes:**

- Understand the operation and architecture of Intel 8085 microprocessor including Instruction Set Architecture, assembly language programming, timing and speed of operation.
- Learn the operation of circuits for user interaction through switches, keyboard and display devices.
- Understand the operation and architecture of Intel 8086 microprocessor including Instruction Set Architecture, assembly language programming, timing and speed of operation.
- Understand the motivation and need for peripheral operations circuits for digital data exchange, timer, serial communication, merits of direct memory access, interrupt controller, and other circuits.

**CO-PO/PSO Mapping:**

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C301.1** | 3 | 2 | 2 | | | | | | | 2 | | 2 | 3 | 2 | |
| **C301.2** | 3 | 2 | 2 | | | | | | | | | 2 | 3 | 2 | |
| **C301.** | 3 | 2 | 3 | | | | | | | 2 | | 2 | 3 | 2 | |
| **C301.4** | 3 | 2 | 3 | | | | | | | 2 | | 2 | 3 | 3 | 2 |

3 = Strong correlation
2 = Moderate correlation
1 = Low correlation
- = No correlation

Signature of Staff In charge Signature of HoD