Daffodil Polytechnic Institute, Institute Code: 50238

Lesson Plan – Academic Session: August 2023 to January 2024

Subject Teacher : Md. Rajib Ahamed (Instructor).
Subject Name : Microprocessor & Interfacing.
Subject Code : 66662
Technology : Computer Technology.
Semester : 6th
Reference Book Name : (1). Microprocessor & Interfacing (**Publisher:** Hoque Publication).
(2). The 8086 and 80286 Microprocessor - Avatar Singh.
(3). Microprocessors and Interfacing: Programming and Hardware - Douglas V. Hall.

eLearning Course Link: *https://dpi.df.daffodil.family/slides/microprocessor-interfacing-for-6th-cmt-66662-224*

Marks	Grade Point	Letter Grade	Marks	Grade Point	Letter Grade
80>	4.00	A+	55-59	2.75	B-
75-79	3.75	A	50-54	2.50	C+
70-74	3.50	A-	45-49	2.25	C
65-69	3.25	B+	40-44	2.00	D
60-64	3.00	B	0-39	0.00	F

Subject Aims:

- To be able to acquire the knowledge on microprocessor, microcomputer.
- To be able to develop the knowledge and skill on the architecture and assembly Language programming of 16- bit microprocessor.
- To be able to acquire the knowledge and skill on memory, interrupt and I/O Interfacing.

Subject Outcome:

- Concept of microprocessor, Basic conception of microprocessor and microcomputer, Architecture and addressing mode of Intel 8086µp.
- Instruction timing of Intel 8086 µp; Memory, input /output and interrupt interfacing of Intel 8086 µp.
- Interfacing principle and peripheral devices; programming of Intel 8086/8088; Intel x86 family, multi-core processor idea.

Mark Distribution (for 150 Marks)			
Theory Marks		**Practical Marks**	
Midterm	20	PC	25
Class test	10	PF	25
Quiz test	10	-	
Final	60	-	
Total	**100**	**Total**	**50**

Class Time Distribution (90 Minutes)

Greetings	**2 Min**
Review Last Topic	**10 Min**
Topic Discussion	**66 Min**
Feedback	**10 Min**
Next Class Topic	**2 Min**

Total = 90 Min

Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipment
01	**Chapter-1:** Understand the concept of microprocessor and microcomputer.	1.1. Define the microprocessor and microcomputer. 1.2. Distinguish between microprocessor and microcomputer.	After the Class Students will be able to learn: • Understand microprocessor and microcomputer. • Known about distinguish between microprocessor and microcomputer.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=HSUOv6DHVwQ
02	**Chapter-1:** Understand the concept of microprocessor and microcomputer.	1.3. Distinguish between microprocessor and microcontroller. 1.4. Describe the block diagram of simple microcomputer.	After the Class, Students will be able to learn: • Understand distinguish between microprocessor and microcontroller. • Necessity of microprocessor in microcomputer.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=dcNk0urQsQM
03	**Chapter-1:** Understand the concept of microprocessor and microcomputer.	1.5. Evaluation of microprocessor (4, 8, 16, 32 & 64 bit microprocessor)	After the Class, Students will be able to learn: • Understand the features of 4, 8, 16, 32 & 64 bit microprocessor.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=Eqc2D9CP9ho
Class Test-01		**Chapter-1 (Understand the concept of microprocessor and microcomputer)**	**To know about concept of microprocessor and microcomputer.**	• **Marker.** • **Exam answer script paper.** • **Question paper.**
04	**Chapter-2:** Understand the architecture of 8086 microprocessor.	2.1. Mention the general features of 8086/8088 microprocessor. 2.2. Describe the pin and signal diagram of 8086/8088 microprocessor.	After the Class, Students will be able to learn: • Learn Details about the general feature's of 8086/8088 microprocessor. • Pin and signal diagram of 8086/8088 microprocessor.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=p3YGaqk_pIQ
05	**Chapter-2:** Understand the architecture of 8086 microprocessor.	2.3. Distinguish between maximum and minimum mode of 8086/8088 microprocessor.	After the Class, Students will be able to learn: • Understand the Distinguish between maximum and minimum mode of 8086/8088 microprocessor.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link:

				https://www.youtube.com/watch?v=Cil7uBaKSTU
06	**Chapter-2:** Understand the architecture of 8086 microprocessor.	2.4. Describe the architecture of 8086 microprocessor.	After the Class, Students will be able to learn • Understand distinguish between maximum and minimum mode of 8086/8088 microprocessor. • Describe the architecture of 8086 microprocessor.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=iiR8wTY2EoY
07	**Chapter-2:** Understand the architecture of 8086 microprocessor.	2.5. Describe the register structure of 8086 microprocessor. 2.6. Mention the difference between 8086 and 8088 microprocessor.	After the Class, Students will be able to learn • Know about register structure of 8086 microprocessor. • Difference between 8086 and 8088 microprocessors.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=-1DNUv8rRgw
Quiz Test-01		**Chapter-2 (Understand the architecture of 8086 microprocessor)**	**To know about architecture and pin diagram of 8086 microprocessor.**	• **Marker.** • **Exam answer script paper.** • **Question paper.**
Assignment-01		**Assignment on chapter 01–02**	❖ **To build up their confidence level & increase creativity on chapter- 01- 02**	**Must be submitted within the next two lectures.**
08	**Chapter-3:** Understand the memory interface of the 8086 microprocessor.	3.1. Sketch the 8086 system memory interface.	After the Class, Students will be able to learn: • Understand sketch the 8086 system memory interface.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=7lLuPQVc85Y
09	**Chapter-3:** Understand the memory interface of the 8086 microprocessor.	3.2. State the meaning of even & odd address boundaries.	After the Class, Students will be able to learn: • Understand the meaning of even & odd address boundaries.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=T_MdZzBANrw

10	**Chapter-3:** Understand the memory interface of the 8086 microprocessor.	3.3. Describe the hardware organization of the memory address space of 8086.	After the Class, Students will be able to learn: • Understand hardware organization of the memory address space of 8086.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=vJhi6hs9gRM
11	**Chapter-3:** Understand the memory interface of the 8086 microprocessor.	3.4. Describe the memory read and write bus cycle of 8086 microprocessor. Explain the technique to de-multiplex the system bus.	After the Class, Students will be able to learn: Understand the memory read and write bus cycle of 8086 microprocessor.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=6w9FjtZj0Ks
Class Test-02		**Chapter-3 (Understand the memory interface of the 8086 microprocessor)**	**To know about concept of memory interfacing of the 8086 microprocessor.**	• **Marker.** • **Exam answer script paper.** • **Question paper.**
Assignment-02		**Assignment on chapter 03**	❖ **To build up their confidence level & increase creativity on chapter- 03**	**Must be submitted within the next two lectures.**
12	**Chapter-4:** Understand the 8086 addressing mode and programming concept.	4.1. Describe the addressing mode of 8086 microprocessor.	After the Class, Students will be able to learn: • Learning about the addressing mode of 8086 microprocessor.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=4ZXu8n7bV4I
13	**Chapter-4:** Understand the 8086 addressing mode and programming concept.	4.2. Describe the software model of the 8086 microprocessor.	After the Class, Students will be able to learn: • Learning about the the software model of the 8086 microprocessor.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=_uIxVLssd6Y
14	**Chapter-4:** Understand the 8086 addressing mode and programming concept.	4.3. Describe the 8086 instruction set.	After the Class, Students will be able to learn: • Learning about the 8086 instruction set.	Computer, Projector, Internet, Whiteboard & Marker.

				YouTube link: https://www.youtube.com/watch?v=0bCP3PdbrCs
15	**Chapter-4:** Understand the 8086 addressing mode and programming concept.	4.4. Explain the instruction format of 8086 microprocessor.	After the Class, Students will be able to learn: • Understand instruction format of 8086 microprocessor.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=QBVJBYcl80E
Quiz Test-02		**Chapter-4 (Understand the 8086 addressing mode and programming concept)**	**To know about concept of 8086 addressing mode and assembly programming language.**	• **Marker.** • **Exam answer script paper.** • **Question paper.**
Assignment-03		**Assignment on chapter 04**	❖ **To build up their confidence level & increase creativity on chapter- 04**	**Must be submitted within the next two lectures.**
16	**Chapter-5:** Understand the input / output interface and peripheral devices of the 8086 microprocessor.	5.1. Describe the 8086 system I/O interface. 5.2. Describe the I/O address space of the 8086 system.	After the Class, Students will be able to learn: • Understand the 8086 system I/O interface.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=KYtuSeiskKo
17	**Chapter-5:** Understand the input / output interface and peripheral devices of the 8086 microprocessor.	5.3. Describe the I/O read and I/O write bus cycle of 8086 microprocessor. 5.4. Define programmable peripheral Interface.	After the Class, Students will be able to learn: • Understand the I/O read and I/O write bus cycle of 8086 microprocessor. • Programmable peripheral Interface.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=pphUIgjvqJ8
18	**Chapter-5:** Understand the input / output interface and peripheral devices of the 8086 microprocessor.	5.5. Mention the commonly used support chips and purpose of those. 5.6. Describe the operation of PPI with block diagram.	After the Class, Students will be able to learn: • Understand the commonly used support chips and purpose of those. • Understand the operation of PPI with block diagram.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link:

				https://www.youtube.com/watch?v=pphUIgjvqJ8
19	**Chapter-5:** Understand the input / output interface and peripheral devices of the 8086 microprocessor.	5.7. Configure the control word of the control register of PPI for simple I/O operations.	After the Class, Students will be able to learn: • Understand the control word of the control register of PPI for simple I/O operations.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=hQsxyBtd3x0
Class Test-03		**Chapter-5 (Understand the input / output interface and peripheral devices of the 8086 microprocessor)**	**To know about concept of the input / output interface and peripheral devices of the 8086 microprocessor.**	• **Marker.** • **Exam answer script paper.** • **Question paper.**
Assignment-04		**Assignment on chapter 05**	❖ **To build up their confidence level & increase creativity on chapter- 05**	**Must be submitted within the next two lectures.**
Mid Term Exam		**Chapters: 1-5**		
20	**Chapter-6:** Understand the interrupt interface of the 8086 microprocessor.	6.1. Mention the types of interrupts. 6.2. Describe the common features of different types of interrupts.	After the Class, Students will be able to learn: • Learning about common features of different types of interrupts.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=zGIQwoQxIpc
21	**Lab Class-1**.	1. Perform the task to develop and execute an assembly language program for solving arithmetic problems using 8086/88□p trainer or MASM type tools or software simulator.	After the Class, Students will be able to learn: • Learning about the Assembley Program.	Computer, Projector, 8086 Emulator Software and Internet YouTube link: https://www.youtube.com/watch?v=Tv_XzIa0eOg
22	**Chapter-6:** Understand the interrupt interface of the 8086 microprocessor.	6.3. Sketch the map of interrupt vector table.	After the Class, Students will be able to learn: • Learning about sketch the map of interrupt vector table.	Computer, Projector, Internet, Whiteboard & Marker.

				YouTube link: https://www.youtube.com/watch?v=NtYq-ZeV78U
23	**Chapter-6:** Understand the interrupt interface of the 8086 microprocessor.	6.4. Describe the external hardware interrupt interface of the 8086 microprocessor.	After the Class, Students will be able to learn: • Learning about the external hardware interrupt interface of the 8086 microprocessor.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=qigLrccx3Rk
Quiz Test-03		**Chapter-6 (Understand the interrupt interface of the 8086 microprocessor)**	**To know about concept of the interrupt interface of the 8086 microprocessor.**	• **Marker.** • **Exam answer script paper.** • **Question paper.**
24	**Chapter-7:** Understand the assembly language programming of 8086 family.	7.1. Define the assembler pseudo instructions. 7.2. Describe the use of assembler directives (i. e. SEGMENT, ENDS, ASSUME, DUP, etc.) 7.3. Describe the use of program development tools (i.e. editor, assembler, linker, locator debugger and emulator.)	After the Class, Students will be able to learn: • Learning about the the assembler pseudo instructions. • Understand the assembler directives (i. e. SEGMENT, ENDS, ASSUME, DUP, etc.) • Understand the program development tools.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=Lvz-6KUNEAw
25	**Lab Class-2**	2. Perform the task to develop and execute an assembly language program for solving logical problems using 8086/88□p trainer or MASM type tools or software simulator.	After the Class, Students will be able to learn: • Learning about the Assembley Program.	Computer, Projector, 8086 Emulator Software and Internet. YouTube link: https://www.youtube.com/watch?v=md04klfy2r4
26	**Chapter-7:** Understand the assembly language programming of 8086 family.	7.4. Explain the sequential, IF-THEN-ELSE, WHILE-DO and REPEAT-UNTILL structure in 8086 assembly language with pseudo code and flow chart.	After the Class, Students will be able to learn: • Understand the sequential, IF-THEN-ELSE, WHILE-DO and REPEAT-UNTILL structure in 8086 assembly language with pseudo code and flow chart. • Understand the assembly language programs.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link:

		7.5. Write assembly language programs.		https://www.youtube.com/watch?v=s4x72c3Mry8&list=PLXcgL_xgEnBGYsiAUtnAmvlInVVQEdxP4&index=2
Class Test-04		**Chapter-7 (Understand the assembly language programming of 8086 family)**	**To know about concept of the assembly language programming of 8086 family.**	• **Marker.** • **Exam answer script paper.** • **Question paper.**
Assignment-05		**Assignment on chapter 06-07**	❖ **To build up their confidence level & increase creativity on chapter- 06-07**	**Must be submitted within the next two lectures.**
27	**Lab Class-3**	3. Perform the task to develop and execute an assembly language program to compute 1's or 2's complement of binary number using 8086/88□p trainer or MASM type tools or software simulator. 4. Perform the task to transmit data from a microprocessor to an I/O using Intel 8086/8088 based microprocessor trainer or MASM type tools or simulator software	After the Class, Students will be able to learn: • Learning about the Assembley Program.	Computer, Projector, 8086 Emulator Software and Internet. YouTube link: https://www.youtube.com/watch?v=Tv_XzIa0eOg
28	**Chapter-8:** Understand the features of advanced microprocessors.	8.1. List the names of other x86 family processors including Pentium series and state the brief specification. 8.2. Describe the real and protected mode memory addressing technique.	After the Class, Students will be able to learn: • Learning about the real and protected mode memory addressing technique. • Learning about the x86 family processors including Pentium series and state the brief specification.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=tpRdxgsSwFY
29	**Chapter-8:** Understand the features of advanced microprocessors.	8.3. State the function of BIST in Pentium processor. 8.4. State multiprocessing and parallel processing.	After the Class, Students will be able to learn: • Understand the function of BIST in Pentium processor. • Understand the state multiprocessing and parallel processing.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link:

				https://www.youtube.com/watch?v=1x_vaB9Sw9c
30	**Lab Class-4**	5. Perform the task to receive data from an I/O to the microprocessor using Intel 8086/8088 based microprocessor trainer or MASM type tools or simulator software. 6. Perform the task to develop and execute an assembly language program/ Subroutine to produce time delays of different durations using 8086/88□p trainer or MASM type tools or software simulator.	After the Class, Students will be able to learn: • Learning about the Assembley Program.	Computer, Projector, 8086 Emulator Software and Internet. YouTube link: https://www.youtube.com/watch?v=VvyUAaRTsww
31	**Chapter-8:** Understand the features of advanced microprocessors.	8.5. Define multi-core processors (i.e. Dual core, Quad core, core ix). 8.6. Write down the advantages of multi-core processors.	After the Class, Students will be able to learn: • Learning about the Define multi-core processors (i.e. Dual core, Quad core, core ix). • Understand the advantages of multi-core processors.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=Pr5yosuGZDc
32	**Chapter-9:** Understand the real world interfacing.	9.1. Describe the interfacing of LED Display with program to the microprocessor. 9.2. Describe the interfacing of seven segment LED display with program to the microprocessor.	After the Class, Students will be able to learn: • Understand the interfacing of LED display with program to the microprocessor. • Learning about the interfacing of seven segment LED display with program to the microprocessor.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=9VASx0RLo7I
33	**Lab Class-5**	7. Perform the task to develop and execute assembly language programs that implement the branching and looping structures using 8086/88□p trainer or MASM type tools or software simulator.	After the Class, Students will be able to learn: • Learning about the Assembley Program.	Computer, Projector, 8086 Emulator Software and Internet. YouTube link: https://www.youtube.com/watch?v=lr1NgKcV-zk

		8. Build a simple computer prototype using 8086/8088 processor with memory, I/O interface and simple I/O devices		
34	**Chapter-9:** Understand the real world interfacing.	9.3. Describe the interfacing of Multiple Digit Display with program to the microprocessor. 9.4. Describe the method of interfacing of stepper motor to the microprocessor.	After the Class, Students will be able to learn: • Understand the interfacing of Multiple Digit Display with program to the microprocessor. • Learning about the method of interfacing of stepper motor to the microprocessor.	Computer, Projector, Internet, Whiteboard & Marker. YouTube link: https://www.youtube.com/watch?v=ZZTuXW0YV_Q
Quiz Test-04		**Chapter-8 and 9 (Understand the features of advanced microprocessors and the real-world interfacing)**	**To know about concept of the features of advanced microprocessors and the real-world interfacing.**	• **Marker.** • **Exam answer script paper. Question paper.**
Assignment-06		**Assignment on chapter 08-09**	❖ **To build up their confidence level & increase creativity on chapter- 08-09**	**Must be submitted within the next two lectures.**
35			**Syllabus Review Class**	
36			**Lab Syllabus Review Class**	Computer, Projector, 8086 Emulator Software and Internet
37			**Group Presentation based on subject.**	
38			**Review class and Model Test.**	
39			**Lab Performance Exam**	Computer, Projector, 8086 Emulator Software and Internet

*****BEST OF LUCK*****