Daffodil Polytechnic Institute, Institute Code: 50238

Lesson Plan – Academic Session: March-2023 to August-2023

Subject Teacher : Md. Rajib Ahamed (Instructor)
Subject Name : Sequential Logic System.
Subject Code : 66653
Technology : Computer Technology.
Semester : 5th
BTEB Text Book Name : Sequential Logic System (Publisher: Technical Prokashani)

Reference Book/Note Name:
1. Digital principles and application − Albert PaulMalvino.
2. Digital Computer Electronics− Albert PaulMalvino.
3. Digital Systems–Ronald J.Tocci.
4. Modern Digital Electronics - R. P. Jain.
Class Note paper.

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

Mark Distribution (for 200 Marks)			
Theory Marks		**Practical Marks**	
Midterm	30	PC	25
Class test	15	PF	25
Quiz test	15	-	-
Final	90	-	-
Total	**150**	**Total**	**50**

Class Timing Distribution	
Particulars	**Time**
Greeting with students	05 Minutes
Previous Class Review	10 Minutes
Present Class Topic Discussion and Lecture Delivery	65 Minutes
Present Class Topics Review	10 Minutes

Subject Aims:
• To be able to acquire the knowledge & skill on Flip Flop, counters, shift registers and their applications.
• To be able to acquire the knowledge & skill on semiconductor memories & ALU.
• To be able to acquire the knowledge & skill on A/D and D/A converters.
• To familiarize with PLD & simple computer (SAP-1& SAP-2).

Subject Outcome:
- Synchronous optical network;
- Integrated services digital network;
- Asynchronous transfer mode; Wireless internet;
- Multimedia communication over IP network;
- Computer telephony integration and unified messaging;
- Telecommunication management network and Information security.

Lecture	Chapter/ Exam / Industrial Visit	Learning Area	Learning Outcome	Class/Lab Supporting Equipment's
1.	Chapter 01 - Understand the features of sequential logic circuits	1.1 Define Sequential logic circuit. 1.2 Define the synchronous and asynchronous sequential logic circuit. Able to Perform algebraic operation	• Understand the concept of synchronous and asynchronous sequential logic	• Basic Class Materials and Projector • Link: https://www.youtube.com/watch?v=AaN72s5WfOM

2.	Chapter 01 - Understand the features of sequential logic circuits	1.3 Define Clock, Timing diagram, Latch & Flip-Flop. 1.4 State the concept of level clocking and edge triggering. 1.5 Describe the operation of sequential logic system with block diagram.	• To know about the Flip-Fop. • To understand about sequential logic system	• Basic Class Materials, Projector, Lecture Slide. • Link: https://www.youtube.com/watch?v=kt8d3CYWGH4
3.	Chapter 02 - Understand Flip Flops	2.1 Define Flip Flop &list the different types of Flip Flops. 2.2 Explain the operation of clocked SR Flip Flop.	• Able to understand about of clocked SR Flip Flop.	• Projector, Internet, • Link: https://www.youtube.com/watch?v=rF_wASnSZkk
4.	Chapter 02 - Understand Flip Flops	2.3 State the advantages of edge triggering in Flip Flop. 2.4 Explain the operation of clocked D, T, JK and Master-slave Flip Flops. 2.5 Describe the operation of Flip Flop as a frequency division circuit. 2.6 State the application field of Flip Flops.	• Understand the D, T, JK • To know about the application field of Flip Flops.	• Projector, Internet, • Link: https://www.youtube.com/watch?v=rF_wASnSZkk https://www.youtue.com/watch?v=tSti91b6qec
5.	**Class Test-1**	**Theory Base**	• **To know about the features of Flip-Flop.** • **RS,D,T,JK Flip-Flop**	• **Answer sheet**
6.	Chapter 03 - Understand Registers	3.1 Define register &list the different types of registers. 3.2 Explain the operation of serial in - serial / parallel out shift registers.	• To know about the serial / parallel out shift registers	• Projector, Internet, • Link: https://www.youtube.com/watch?v=-paFaxtTCkI
7.	Chapter 03 - Understand Registers	3.3 Explain the operation of parallel in- parallel / serial out shift registers. 3.4 Describe the operation of shift left & shift right register. 3.5 Describe the operation of buffer register and universal shift registers. 3.6 Mention the uses of registers.	• Understand about the serial / parallel out shift registers	• Projector, Internet, • Link: https://www.youtube.com/watch?v=tSti91b6qec
8.	Chapter 04 - Understand binary counter circuits	4.1 Define binary counter. 4.2 State the difference between asynchronous and synchronous counter. 4.3 Explain the operation of asynchronous, synchronous and decade counter.	• Understand about the operation of asynchronous, synchronous and decade counter.	• Projector, Internet, • Link: https://www.youtube.com/watch?v=iaIu5SYmWVM

9.	Chapter 04 - Understand binary counter circuits	4.4 State the modulus of a counter & describe the principle of divide - by- n counter. 4.5 Describe the operation of a binary up / down counter. 4.6 State the principle of ring, Johnson & Cascaded counter. 4.7 State the application of different types of counters.	• Understand the concept about the binary up / down counter.	• Projector, Internet, • Link: https://www.youtube.com/watch?v=iaIu5SYmWVM Counter IC
10.	**Class Test-2**	**Theory Base**	• **Understand serial / parallel registers** • **Asynchronous / synchronous and decade counter.**	• **Answer sheet**
11.	Chapter 05 - Understand semiconductor memories	5.1 List the type of memories. 5.2 Describe the principle of serial and parallel access memory. 5.3 Explain the internal organization of semiconductor memory. 5.4 Describe the technique of memory addressing.	• Understand the technique of memory addressing.	• Projector, Internet, • Link: https://www.youtube.com/watch?v=1G7TCcgVuiQ
12.	Chapter 05 - Understand semiconductor memories	5.5 Explain the read and write operation of semiconductor memory. 5.6 Explain the principle of static and dynamic RAM. 5.7 Describe the principle operation of ROM, PROM, EPROM and EEPROM. 5.8 Mention the maximum clock speed, bus width and bandwidth of SDRAM, RDRAM, DDR SDRAM, DDR2 SDRAM, DDR3 SDRAM & DDR4 SDRAM.	• Understand the semiconductor memory. • To know about the DDR2 SDRAM, DDR3 SDRAM & DDR4 SDRAM.	• Projector, Internet, • Link: https://www.youtube.com/watch?v=1G7TCcgVuiQ
13.	**Quiz Test-1**	**Theory Base**	• **Understand the concept of DDR2 SDRAM, DDR3 SDRAM & DDR4 SDRAM**	• **N/A**
14.	Chapter 06 - Understand arithmetic logic circuit:	6.1 Mention the basic principle of ALU. 6.2 List the application of ALU. 6.3 Mention the principle of digital comparators.	• Understand about the ALU.	• Projector, Internet, Computer, • Link: https://www.youtube.com/watch?v=1I5ZMmrOfnA

15.	Chapter 06 - Understand arithmetic logic circuit:	6.4 List the application of digital comparators. 6.5 Mention the principle of binary rate multiplier with block diagram.	• To know about the multiplier with block diagram.	• Projector, Internet, Computer, • Link: https://www.youtube.com/watch?v=1I5ZMmrOfnA
16.	**Quiz Test-2**	**Theory Base**	• **Understand the arithmetic logic circuit.**	• **N/A**
17.	Chapter 07 - Understand D/A converter	7.1 Mention the principle of level conversion &D/A conversion. 7.2 Mention the types of D/A converter. 7.3 Explain the operation of a binary weighted D/A and R-2R ladder D/A converter.	• Understand the architecture and R-2R ladder D/A converter.	• Projector, Internet, Computer, • Link: https://www.youtube.com/watch?v=Y2OPnrgb0pY
18.	Chapter 07 - Understand D/A converter	7.4 State the terms – resolution, percentage of resolution, accuracy, offset error and settling time as specification of D/A converter. 7.5 State the application field of D/A converter, video and integrated data.	• Understand the of D/A converter	• Projector, Internet, Computer, • Link: https://www.youtube.com/watch?v=Y2OPnrgb0pY
19.	**Quiz Test-3**	**Theory Base**	• **Understand D/A converter.**	• **N/A**
20.	Chapter 08 - Understand A/D converter.	8.1 State the general principle of A/D conversion and list the types of A/D converter. 8.2 State the working principle of 3-bit parallel A/D converter. 8.3 Describe the operation of Digital Ramp A/D converter	• To know the system of A/D converter	• Projector, Internet, Computer, • Link: https://www.youtube.com/watch?v=_gZjBx9cdro
21.	Chapter 08 - Understand A/D converter.	8.4 Explain the operation of successive approximation, dual slope and Flash A/D converter. 8.5 State the terms – resolution, accuracy, and conversion time as specification of A/D converter.	• Understand the A/D converter.	• Projector, Internet, • Link: https://www.youtube.com/watch?v=gZjBx9cdro
22.	**Quiz Test-4**	**Theory Base**	• **Understand the A/D converter.**	• **N/A**

23.	Chapter 09 - Understand the programmable logic devices.	9.1 Defines PLD and the advantages of PLD. 9.2 Describe the principle of PLD. 9.3 Discuss simplified logic diagram of PLA, PAL and GAL. 9.4 State the basic feature of FPGA. 9.5 Describe the programming process SPDL 9.6 Describe the complex programmable logic device (CPDL).	• To know the architecture of PLD	• Projector, Internet, • Link: https://www.youtube.com/watch?v=8MwIgsCSTdc
24.	Chapter 10 - Understand the organization of a SAP-1	10.1 State the meaning of SAP. 10.2 State the function of each stage of SAP-1 with block diagram. 10.3 State the function of control signals i.e. Enable, Load, Clock and Clear of each register. 10.4 State the instruction for accessing and storing data in RAM of SAP-1. 10.5 Describe the bus organization of SAP- 1.	• To know about the SAP-1	• Theory Base Projector, Internet, • Link: https://www.youtube.com/watch?v=lYCEQqSM08I
25.	**Class Test-3**	**Theory Base**	• **Know the architecture of PLD and SAP-1.**	• **Answer sheet**
26.	Chapter 11 - Understand the Micro and Macro Instruction of SAP-1	11.1 Describe the function of controller sequencer. 11.2 State the control word/micro instruction of controller sequencer. 11.3 State the meaning of macro instructions and their corresponding binary op-code used in SAP-1 11.4 State the concept of machine cycle, fetch cycle, execution cycle and instruction cycle 11.5 Describe the fetching steps of micro instruction in different T states.	• To know about the SAP-1.	• Projector, Internet, • Link: https://www.youtube.com/watch?v=lYCEQqSM08I

27.	Chapter 12 - Understand the organization of a SAP-2	12.1 State the function of each stage of SAP-2 with block diagram. 12.2 State the function of control signals of SAP-2 12.3 Describe the bus organization of SAP-2. 12.4 State the concept of Instruction Set of SAP-2. 12.5 Mention the differences between SAP-1 & SAP-2.	• Understand to SAP-2.	• Projector, Internet, • Link: https://www.youtube.com/watch?v=J4uWOWRfNbg
28.	**Class Test-4**	**Theory Base**	• **Understand the SAP-1 and SAP-2**	• **Answer sheet**
29.	**REVIEW CLASS REGARDING STUDENTS PROBLEM**			
30.	**REVIEW CLASS REGARDING STUDENTS PROBLEM**			
GOOD LUCK!				
Practical Class				
1	**Practical Class-1**	Study the Operation D, T, JK and Master-slave Flip Flops	To know the operation of D, T, JK and Master-slave Flip Flops	• Computer, • Projector, • IC , Connector, • Bread board
2	**Practical Class-2**	Study about Flip-Flop.	Study the operation SIPO	• Computer, Projector, • Internet, Or IC, • Bread Board • Connecting wire
3	**Practical Class-3**	Study about Flip-Flop.	Study the operation of SISO	• Computer, Projector, • Internet, Or IC, • Bread Board • Connecting wire
4	**Practical Class-4**	Study about Flip-Flop.	Study the operation of A/D Converter	• Computer, Projector, • Internet, Or IC, • Bread Board • Connecting wire