Daffodil Institute of IT

DEPARTMENT OF COMPUTER TECHNOLOGY

Semester Plan

Course Title: Surveillance Security System

Course Code: 66652

Semester: 5th

Course Instructor: Afifa Hoque

Jr.Instructor

Department of Computer Technology

Daffodil Institute of IT

Email : afifa@diit.info

Objective:

- To preserve the integrity of data
- To protect the confidentiality of data
- To promote the availability of data for authorized users.

SL No.	Subject code	Name of Subject	T	P	C	Marks				
						Theory		Practical		TOTAL
						Cont. Assess	Final Exam	Cont. Assess	Final Exam	
1	66653	Sequential Logic System	3	3	4					

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)

SHORT DESCRIPTION

Sequential system concept; Flip-flops; Registers & counters; Semiconductor Memories; A/D & D/A converters; PLD and SAP-1& SAP-2.

DETAIL DESCRIPTION

Theory:

1. Understand the features of sequential logic circuits

1.1 Define Sequential logic circuit.

1.2 Define the synchronous and asynchronous sequential logic circuit.

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.

2. 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.

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.

3. 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.

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.

4. 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.

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.

5. 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.

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.

6. 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.

6.4 List the application of digital comparators.

6.5 Mention the principle of binary rate multiplier with block diagram.

7. Understand D/A converter

7.1 Mention the principle of level conversion/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.

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.

8. 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

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 pecification of A/D converter.

8.6 Describe the operation of sample & hold circuits and its application.

9. 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).

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.

11.Understand the organization of a SAP-2

11.1 State the function of each stage of SAP-2 with block diagram.

11.2 State the function of control signals of SAP-2

11.3 Describe the bus organization of SAP-2.

11.4 State the concept of Instruction Set of SAP-2.

11.5 Mention the differences between SAP-1 & SAP-2.

PRACTICAL:

1. Prepare the clocked RS flip-flops and check its truth table and operation.

2. Prepare the clocked D & T flip-flops and check its truth table and operation.

3. Prepare the clocked JK & Master-slave flip-flops and check its truth table and operation.

4. Prepare the serial / Parallel in - serial / parallel out shift registers and check its working operation.

5. Prepare the left shift &right shift register and check its working operation.

6. Prepare the Decade counter and check its operation with truth table.

7. Prepare the Ring counter and check its operation with truth table.

8. Prepare the Up/Down counter and check its operation with truth table.

9. Prepare a 4 bit ALU and check the operation of ALU

10. Show the read / write operation of a 4 bit memory chip.

11. Show the D/A conversion procedure of D/A converter.

12. Show the A/D conversion procedure of A/D converter.

13. Prepare a digital clock & observed the output.

REFERENCE BOOKS

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