

CSE 203 SWITCHING THEORY & LOGIC DESIGN

[3 1 0 4]

1. INTRODUCTION TO LOGIC CIRCUITS:

Variables and functions, Inversion, Truth tables, Logic gates and networks, Boolean algebra, Introduction to VHDL, Synthesis using AND OR and NOT gates.
(Chapter 2 (except 2.5.1, 2.5.2 & 2.5.3, 2.7, 2.8) and appendix A of Text Book 1)

(6 hrs)

2. OPTIMIZED IMPLEMENTATION OF LOGIC FUNCTIONS:

Karnaugh map, Strategy for minimization, Minimization of POS forms, Incompletely Specified Functions, Multiple output circuits NAND and NOR logic networks, multilevel NAND and NOR circuits, Analysis of multilevel circuits.

(Chapter 4 of Text Book 1(up to 4.8 except 4.7, 4.7.1, 4.7.2))

(8 hrs)

3. ARITHMETIC CIRCUITS:

Positional number representation, Addition of unsigned numbers, Signed numbers, Fast adders, Design of arithmetic circuits using VHDL, BCD representation.

(Chapter 5(5.1 to 5.5 (except 5.5.1), 5.7.3) of Text Book 1)

(10 hrs)

4. COMBINATIONAL CIRCUIT BUILDING BLOCKS:

Multiplexer, Decoder, Encoder, Code converter, Arithmetic comparison circuits, VHDL for Combinational Circuits.

(Chapter 6 of Text Book 1)

(8 hrs)

5. SYNCHRONOUS SEQUENTIAL CIRCUITS:

Flip Flops, Registers, Counters.

(Chapter 6 and 7 of Text Book 2 (up to 7.5), 7.13(except 7.13.1) and 8.1 of Text Book 1)

(14 hrs)

6. OVERVIEW OF DIGITAL INTEGRATED CIRCUITS:

Overview of semiconductor diode, BJT, MOSFET, TTL – standard, High speed, low-power, low-power schotky, CMOS logic-NAND, NOR.

(Only specified topics from chapter 14 of Text Book 3)

(2 hrs.)

Text Books:

1. Stephen Brown and Zvonko Vranesic, “Fundamentals of Digital Logic with VHDL Design” Tata McGraw Hill Publishing Co. Ltd., 2000.
2. M. Morris Mano, “Digital Design” , PHI Pvt. Ltd., 2nd Edition, 2000.
3. Donald P. Leach, Albert Paul Malvino, Goutam Saha, “Digital Principles and Applications” Tata McGrawHill Publishing Co. Ltd., 6th Edition, 2006.

References:

1. J. Bhasker, “A VHDL Primer”, PHI Pvt. Ltd., 3rd Edition, 2005.
2. William I Fletcher, “An Engineering Approach to Digital Design”, PHI Pvt. Ltd.
3. John M. Yarbrough, “Digital Logic Applications and Design”, 2009