MANIPAL UNIVERSITY JAIPUR

School of Computing and Information Technology

Department of Computer Science and Engineering
Course Hand-out

Switching Theory & Logic Design | CS 1302 | 4 Credits

Session: 2015-2016 | Faculty: Dr. Umashankar Rawat

Course Outcomes: At the end of the course, students will be able to

CS1302.1: Be able to understand and illustrate numeric information in different forms, e.g. different bases, signed integers, various codes such as ASCII, Gray, and BCD.

CS1302.2: Be able to describe simple Boolean expressions using the theorems and postulates of Boolean algebra and to minimize combinational functions.

CS1302.3: Be able to design and analyze small combinational circuits and to use standard combinational functions/building blocks to build larger more complex circuits and hence enhance employability skills.

CS1302.4: Be able to design, analyse and evaluate small sequential circuits and devices and to use standard sequential functions/building blocks to build larger more complex circuits and hence enhance employability skills.

CS1302.5: Be able to understand working and use of logic families like BJT, MOSFET etc.

A. SYLLABUS

Introduction to logic circuits: Variables and functions, Inversion, Truth tables, Logic gates and networks, Boolean algebra, Introduction to VHDL. Optimized implementation of logic functions: Synthesis using AND OR and NOT gates, 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. Number representation and arithmetic circuits: Positional number representation, Addition of unsigned numbers, Signed numbers, Fast adders, Design of arithmetic circuits using VHDL, BCD representation. Combinational-Circuit building blocks: Multiplexer, decoder, Encoder, Code converter, Arithmetic comparison circuits, VHDL for Combinational Circuits; Flip Flops, Registers, Counters. Overview of semiconductor diode: BJT, MOSFET,.

B. TEXT BOOKS

1. S. Salivahanan, S. Arivazhagan,"Digital Circuit and Design" Fourth Edition, 2012.
2. M. Morris Mano, Michael D. Ciletti, "Digital Design", *Prentice Hall of India Pvt. Ltd.*, 2008.
3. P. Leach, A. Malvino, G. Saha, *"Digital Principles and Applications"*, TMH, 6th Edition, 2006.
4. Brian Holdsworth, Clive Woods, "Digital Logic Design", *Elsevier India Pvt. Ltd.*, 2005.