

CONSPECTUS on Digital Logic

I. Boolean Algebra, Functions, and Minimization

1. Key concepts ncepts and Overview. Logic Gates. Set of Postulates. Principle of Duality. Boolean Functions. Boolean Algebra Theorems.
2. Canonical or Standard Form of Functions. Methods of Function Minimization (reducing the number of literals in an expression).Karnaugh-map or K-map.
3. Special Case: “Don’t Care” Terms.

II. Analyzing and Synthesizing Combinational Logic Circuits

1. Key concepts and Overview. Standard Logic and Schematic Layout (Review).
2. Designing Logic Circuits. Combinational Logic Analysis and Design. Compressing Truth Tables and K-maps.
3. Beyond Standard Logic Applications. Programmable Logic Devices (PLDs).

III. Introduction to Feedback Circuits and Sequential Logic Analysis

1. Key concepts and Overview
2. SR Flip-Flops
3. Asynchronous Sequential Logic Issues
4. Finite State machine
5. Additional Flip Flops
6. Sequential Circuit Analysis

IV. Sequential Circuit Design & Techniques

1. Key concepts and Overview.
2. Synchronous Finite State Machine Design (Classical Design)
3. State Assignment Encoding, Shift Register Counters, and Adding an Enable Input
4. Inspection Design Methods for Finite State Machines.
5. FSM Design Examples

References:

1. Izad Khormae, www.EngrCS.com, Digital Logic Design, Version 4.6 printed on February 2016 <https://www.engrcs.com/courses/engr250/engr250lecture.pdf>.
2. A.F. Kana, Digital Logic Design, <http://american.cs.ucdavis.edu/academic/ecs154a.sum14/postscript/cosc205.pdf>
3. Pu-Jen Cheng, https://www.csie.ntu.edu.tw/~pjcheng/course/asm2008/asm_ch2_dl.pdf
4. Mansaf Alam, Bashir Alam, Digital Logic Design, DOI: 10.13140/RG.2.1.3359.7523 Edition: 1st Isbn: 978-81-203-5108-0 Publisher: PHI