

CS303 Logic and Digital System Design

Fall 2003-2004

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Time-table: Class: Wed 11:40–12:30; Fri 13:40–15:30. Office: Wed 15:40–16:30.

Catalog Data: CS 303 Logic and Digital System Design (3 cr.) Prerequisites: None. Number systems and conversion, boolean algebra, the assertion level concept; minterm and maxterm expansions, Karnaugh maps and Quine McCluskey minimization, combinatorial logic circuit design, NAND and NOR gate based design. State machines and sequential circuits, flip-flops, minimization of state tables, state assignment. Higher level digital system design using SSI-MSI blocks such as multiplexers/decoders, adders, memory and programmable gate arrays; bus oriented systems. Asynchronous sequential circuits, flow tables, timing hazards.

Textbook:

- M. M. Mano & C. R. Kime, *Logic and Computer Design Fundamentals, 2nd Ed.*, Prentice Hall 2000.

Useful books:

- J. F. Wakerly, *Digital Design Principles and Practices*, Prentice Hall, 1990.
- W. I. Fletcher, *An Engineering Approach to Digital Design*, Prentice Hall, 1980.

Other Relevant Material:

- Xilinx Web Site @ <http://www.prenhall.com/xilinx>
- Course Web Page @ <http://micro.sabanciuniv.edu/cs303>

Computer Usage: Xilinx Foundation Series Software Version 2.1i

Goals: To develop the engineering skills to design digital systems.

Prerequisites by Topic:

- Basic circuit theory (Does the word “voltage” make sense?)
- Number representations and basic computing algorithms.

Course Outline:

1. Logic and Digital Design Fundamentals (1 week)
2. Combinational Logic Circuits (3 weeks)
3. Sequential Logic Circuits (4 weeks)
4. Digital Memory (1 week)
5. Register Transfers and Datapaths (3 weeks)
6. Digital Computer Fundamentals (2 weeks)

Grading Policy: Cheating and late submissions are severely penalized.

Grading: MT#1 17%; MT#2 18%; Project 15%; Lab work 25%; HWs 5%; Final 20%.