

Memorial University of Newfoundland
Engineering 5865 Digital Systems
COURSE OUTLINE

Winter 2006

<http://www.engr.mun.ca/~licheng/5865>

- Instructor:** Cheng Li, licheng@engr.mun.ca, EN - 4012, 737- 8972
- Office Hours:** Tuesday 14:00 - 16:30, or by individual appointment
- Lectures:** Tuesday, and Thursday 10:30 - 11:45 in EN - 1003
- Labs:** Thursday 14:00 - 17:00 in EN - 3065
- Objective:** This course aims to cover concepts, tools, and issues pertaining to specification, modeling, analysis, simulation, testing and synthesis of digital systems, including PLD, FPGA, and ASIC devices.
- Prerequisites:** Knowledge about Digital Logic Circuits, OOP, and Microprocessors.
- Course Text:** J. R. Armstrong, *VHDL Design Representation and Synthesis (Second Edition)*, Prentice Hall, 2000
- Contents:** The topics will include, but not be limited to:
1. Concepts of Digital Logic and Principles of Digital Circuits Design
 2. Advanced Minimization Techniques
 3. Design of Logic Circuits with Programmable Logic Devices (PLDs, FPGAs)
 4. Introduction to ASICs and ASIC Design Methodology
 5. Analysis, Modeling and Partitioning for Logic Synthesis and VHDL Coding
 6. Constraining Designs, Synthesizing, Simulation and Optimization
 7. Design for Testability, Built-In Self-Test, and Fault Tolerance
 8. Digital System Reliability
 9. Noise and Transmission Line Effects
- Evaluation:**
- | | |
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| Labs and miniproject: | 30 % |
| Midterm: | 25 % (March 14 th , Tuesday, tentative) |
| Final exam: | 45 % |

*: Project mark is given to the group, not individuals in the group.

Teaching Assistants:

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| Tianqi Wang | Office: EN-4029 | E-mail: twang@engr.mun.ca |
| Ling Wu | Office: EN-4029 | E-mail: lwu@engr.mun.ca |
| Shi Chen | Office: EN-4029 | E-mail: |

Computer-Aided Design Tools:

Synopsys and Cadence CAD Tools for Digital System VLSI Design

References:

1. Z. Navabi, *VHDL: Analysis and Modeling of Digital Systems*, McGraw Hill (Second Edition), 1998
2. Z. Navabi, *Verilog Digital System Design*, McGraw Hill, 1999
3. S. Palnitkar, *VHDL Design Representation and Synthesis (Second Edition)*, Prentice Hall, 2000
4. J. Bhasker, *VHDL Primer (Third Edition)*, Prentice Hall, 1999
5. P. J. Ashenden, *The Designer's Guide to VHDL*, Morgan Kaufmann Publisher, Inc, 1996
6. C. Roth, *Digital System Design Using VHDL*, PWS Publishing Co., 1998
7. S. Brown and Z. Vranesic, *Fundamentals of Digital Logic with VHDL Design*, McGraw Hill, 2000
8. J. Wakerly, *Digital Design: Principles and Practices (Six Edition)*, Prentice Hall, 2000
9. Yalamanchili, *VHDL Starter's Guide: From Simulation to Synthesis*, Prentice Hall, 1999
10. Neil H.E. Weste, Kamran Eshraghian, *Principles of CMOS VLSI Design*, Addison Wesley; 2nd edition; Oct 1994, ISBN: 0201533766
11. Michael J. S. Smith, *Application-Specific Integrated Circuits*, Addison-Wesley; June 1997