Memorial University of Newfoundland
Engineering 5865   Digital Systems
COURSE OUTLINE
Winter 2011
http://www.engr.mun.ca/~licheng/5865

Instructor:	Cheng Li, licheng@mun.ca, EN - 4012, 737- 8972
Office Hours:	Monday 14:00 – 16:00, or by individual appointment
Lectures:	Tuesday, and Thursday 14:30 - 15:45 in EN - 1001
Labs:	Thursday 9:00 - 12:00 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:	C. Roth, *Digital Systems Design Using VHDL (2nd Edition),* CL-Engineering Publisher, March 2007 (ISBN-10: 0534384625, ISBN-13: 978-0534384623)

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:

Problem sets (4):	0 %	(Due: Jan. 25, Feb. 8, Mar. 15, Mar. 31)
Labs and mini-project:	30 %	
Midterm:	20 %	(March 1st, Tuesday, tentative)
Final exam:	50 %	

Teaching Assistants:

Cheng Wang   Office: EN-2041   E-mail: cwang@mun.ca

Computer-Aided Design Tools:

Synopsys, Mentor Graphics, and Cadence CAD Tools for Digital System VLSI Design

References:

1. P. Chu, *RTL Hardware Design Using VHDL: Coding for Efficiency, Portability, Scalability*, John Wiley & Sons, Inc., New Jersey, 2006 ISBN: 0-471-72092-5.
2. J. R. Armstrong, *VHDL Design Representation and Synthesis (Second Edition)*, Prentice Hall, 2000
3. Z. Navabi, *VHDL: Analysis and Modeling of Digital Systems*, McGraw Hill (Second Edition), 1998
4. Z. Navabi, *Verilog Digital System Design*, McGraw Hill, 1999
5. S. Palnitkar, *VHDL Design Representation and Synthesis (Second Edition),* Prentice Hall, 2000
6. J. Bhasker, *VHDL Primer (Third Edition),* Prentice Hall, 1999
7. P. J. Ashenden, *The Designer's Guide to VHDL*, Morgan Kaufmann Publisher, Inc, 1996
8. C. Roth, *Digital System Design Using VHDL*, PWS Publishing Co., 1998
9. S. Brown and Z. Vranesic, *Fundamentals of Digital Logic with VHDL Design*, McGraw Hill, 2000
10. J. Wakerly, *Digital Design: Principles and Practices (Six Edition)*, Prentice Hall, 2000
11. Yalamanchili, *VHDL Starter's Guide: From Simulation to Synthesis*, Prentice Hall, 1999
12. Neil H.E. Weste, Kamran Eshraghian, *Principles of CMOS VLSI Design*, Addison Wesley; 2nd edition; Oct 1994, ISBN: 0201533766
13. Michael J. S. Smith, *Application-Specific Integrated Circuits,* Addison-Wesley; June 1997