CSCE 611: DIGITAL ELECTRONICS SYSTEMS DESIGN

1. CSCE 611: DIGITAL ELECTRONICS SYSTEMS DESIGN

2. Credit: 3-hrs; Contact: 3 lectures of 50 minutes each or 2 lectures of 75 minutes each per week

3. Instructor: Jason Bakos

4. Textbook:

5. Specific Course Information
    a. Catalog Description: Design techniques for logic systems; emphasis on higher-level CAD tools such as hardware description languages and functional modeling
    b. Prerequisite: CSCE 212 and by Topic: Digital logic, Computer architecture, Programming in a high level language
    c. Required for Computer Engineering; CSCE 5xx elective for computer science and computer information systems

6. Specific Goals for the Course
    a. LEARNING OUTCOMES: After completing this course students should be able to:
        1. *HDL design*: Design large-scale digital systems using VHDL
        2. *Simulation and verification*: VerificationPerform behavioral verification using test benches and simulation
        3. *Microarchitecture design*: Design a pipelined microprocessor that implements the MIPS instruction set
        4. *Interconnect design*: Design a system bus architecture with CPU, memory, and I/O interfaces
        5. *Logic synthesis*: Synthesize, place-and-route, and implement a computer system on a programmable hardware platform
    b. Relation of course outcomes to Student Outcomes: CE: see page 2; For CS & CIS CSCE 611 is 5xx-level and therefore cannot be counted on to contribute to outcomes.

7. Topics Covered:
    - VHDL digital design flow
    - Design methodologies and techniques
    - Microarchitecture design
    - Test bench design
    - Memory models
    - Bus and interface design

Computer Engineering

Relation of Course Outcomes to EAC Student Outcomes*

Course Outcomes (CE)	Student Outcomes											
	(a) apply knowledge of mathematics, science, and engineering	(b) design and conduct experiments, … interpret data	(c) design a system, component, or process to meet desired needs …	(d) function on multidisciplinary teams	(e) identify, formulate, and solve engineering problems	(f) an understanding of professional and ethical responsibility	(g) communicate effectively	(h) the broad education to understand the impact of engineering solutions …	(i) a recognition of the need for, and an ability to engage in life-long learning	(j) a knowledge of contemporary issues	(k) use the techniques, skills, and modern engineering tools ….	(CE) demonstrate knowledge of discrete mathematics [CE]
Criteria	a	b	c	d	e	f	g	h	i	j	k	CE
1.												
2.												
3.												
4.												
5.												

* 3 = major contributor, 2 = moderate contributor, 1 = minor contributor; blank if not related

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Class/Laboratory Schedule:
Lecture: 3 periods of 50 minutes or 2 periods of 75 minutes per week

Course Coordinator: Jason Bakos

Modification and Approval History:
Initial description April 1999
Revised, June 2001
Revised June 2005 by Caroline Eastman to modify format
Revised June 2005 by Jim Davis to modify textbook and content
Revised June 2011 by Jason Bakos to modify textbook and content