Design of Digital Systems
CSEE 4270

Fall Semester, 2017
Location: Driftmier Engineering Building Room 209
Time: Monday 01:25-02:15 p.m. (Lectures); Friday 01:25-4:25 p.m. (Lectures and Labs)

Instructor

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Course website: https://www.elc.uga.edu

Overview

Learn the building blocks of digital systems and design methods to construct combinatorial and sequential circuits through the use of hardware description language (HDL) and field-programmable gate array (FPGA).

Prerequisites

CSEE 2220 Logic Design AND ENGR 2170 Electrical Circuits

Syllabus

1. Combinational logic design
2. Sequential logic design – controllers
3. Datapath components
4. Register-transfer level (RTL) design
5. Physical Implementation of logic design
6. Hardware description language (HDL) – Verilog
7. HDL for combinational logic design
8. HDL for sequential logic design
9. HDL for datapath components
10. HDF for RTL design
11. FPGA implementation using Spartan 3E starter kits

Textbooks

(Required) Verilog for Digital Design,
Frank Vahid and Roman Lysecky
ISBN-10: 0470052627

Grade Evaluation

The overall course grade will be a weighted average of homework and exams, as follows:

Lab projects (8 in total):	**60%**
Final Project:	**30%**
Attendance:	**10%**

Each lab project will have a **pre-lab component, demo, and lab report**. The grading of each will add up to the total grade of that lab project. Final project is similar in grading. Attendance is critical in this class; sign up sheet will be used at the beginning of each lecture and lab session. Final grade of this class will be evaluated as below.

90-100 A
85-90 A-
80-85 B+
75-80 B
70-75 B-
65-70 C+
60-65 C
55-60 C-
below 60 D

Class Attendance (Required)

Attending class regularly is essential and will be checked every time. The responsibility of promptly making up work missed on account of absences rests entirely with the student. Be forewarned that each class is built on material covered in the previous class, so you may find yourself lost as a result of an absence. In addition, if you are late for class, you will more than likely find yourself unable to catch up, so be in class on time. If you KNOW ahead of time that you will have to miss a class, PLEASE let me know in advance. If you miss a class for unforeseen circumstances, please contact me as soon as possible so we're all on the same page. **A student who incurs <u>4 or more unexcused absences</u> may be withdrawn from the class at the discretion of the instructor.**

Engineering Professionalism Policy

Engineers make great contributions to society. Engineering is a very satisfying profession that provides many rewards but is demanding and requires hard work. The engineering profession is governed by a code of ethics. Engineering faculty at UGA expect students to act in a professional manner at all times and develop the work ethics required for a successful engineering career. Engineering students at UGA are responsible for maintaining the highest standards of professionalism and professional practice. **Use of cell phones or other digital devices during lectures will not be tolerated.** If a student is asked to leave due to unprofessional behavior they will be counted absent.

Out of the Classroom Meetings with Instructor

Meetings with the course instructor can be arranged as needed. In order to develop professional skills, **students are required to contact the instructor by email and set a date and time for the meeting**. If you make an appointment and must cancel, it is expected that you contact the instructor in a reasonable amount of time. It is the student's responsibility to seek assistance if they are experiencing trouble understanding the materials presented in this course.

Questions and Help

The lecture notes, handouts and homework sets will be posted online at the course website: https://www.elc.uga.edu. Students are encouraged to email the instructor with brief questions at any time; he will respond as promptly as he can. The instructor's office locates at Riverbend South Room 166 (220 Riverbend Road), you may come for questions and help as many as you wish by appointments.

UGA Student Honor Code

The University of Georgia seeks to promote and ensure academic honesty and personal integrity among students and other members of the University Community. All students agree to abide by the Student Honor Code by signing the UGA Admission Application. This codes provides, "I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others." All academic work must meet the standards contained in this Code and in A Culture of Honesty. Students are responsible for informing themselves of those standards before performing any academic work. Links for more detailed information can be found at: http://www.uga.edu/honesty/.

Course Learning Objectives (ABET A – K)

	Not Met	Met
A. An ability to apply knowledge of mathematics, science and engineering		x
B. An ability to design and conduct experiments as well as to analyze and interpret data		x
C. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability		x
D. An ability to function on multi-disciplinary teams		x
E. An ability to identify, formulate and solve engineering problems		x
F. An understanding of professional and ethical responsibility	x	
G. An ability to communicate effectively		x
H. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context		x
I. A recognition of the need for, and an ability to engage in life-long learning		x
J. A knowledge of contemporary issues		x
K. An ability to use techniques, skills and modern engineering tools necessary for engineering practice		x