CDA 4253/CIS 6930 FPGA System Design

Instructor:	Dr. Hao Zheng
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Class Meeting Time/Location:	$12:30-1:45pm$ Tue. & Thr at BSN 2205.
Credit Hours:	3
Office Hour:	$2:30-4pm$, MW, or by appointment

Course Description

Catalog Description Covers analysis and design of digital systems using VHDL simulation. Provides experience with field programmable logic gates and gate arrays. Introduces the requirements for field programmable systems; testing of circuitry, and analysis of system design.

Additional Description This course introduces digital system designs based on field programmable logic arrays (FPGAs). Basic concepts of FPGA architectures are explained, and typical design flows using VHDL (a hardware description language) are introduced. Some unique features of FPGAs and their applications in digital system designs will also be discussed. This course provides extensive hands-on experience through various digital design lab assignments targeted on a type of FPGA boards.

Outcomes At the end of this course, students will gain understandings of fundamental concepts of FPGAs, digital system design and analysis using VHDL and FPGA design tools, and the capabilities of implementing non-trivial digital system designs on FPGAs under specified requirements.

Prerequisites CDA 3201/CDA 3201L Logic Design/Logic Design Lab

Textbook No required textbook. However, many topics are based on the following two references, which you are encouraged to acquire.

- For VHDL related topics, the following book will be used extensively throughout the semester. It is available on-line from the USF Library.

  FPGA Prototyping by VHDL Examples: Xilinx MicroBlaze MCS SoC, 2nd Edition, Pong Chu, Wiley-Interscience, 2017, ISBN 978-1119282747,

- For reference on Xilinx Zynq-7000 FPGAs, *The Zynq Book* and its companaion tutorials, are available for free at

  http://www.zynqbook.com.

Other relevant material will be posted online during the semester.

Attendance Required.

Last Day to Drop with 'W': March 23rd, 2019

Evaluation

Assignments/Exam	Grades	Date
Lab assignments	60%	TBA
Final Project	40%	TBA

Final grading scale

$< 60\%$	$60\% - 69.99\%$	$70\% - 79.99\%$	$80\% - 89.99\%$	$\geq 90\%$
F	**D**	**C**	**B**	**A**

- The instructor reserves the right to give +/- letter grades for the final grades.
- The above grading scale may be subject to minor change depending on the overall class performance statistics.
- No incomplete (I) grades will be given.

Assignments

- All assignments are individual unless specified otherwise.
- The solution submissions must be your own work. Copying others' work is prohibited.
- Late submissions will **NOT** be accepted unless approvals for extensions are obtained from the instructor beforehand.
- Requests for re-grading must be submitted via email or in writing **within one week after a graded assignment is returned**.
- Additional specific requirements may be imposed for individual assignments. Read carefully each assignment description when it is distributed.

Note for CIS 6930 enrollments There are additional requirements in some assignments and the final project for students who enroll in CIS 6930. These additional requirements are *optional* for students who enroll in CDA 4253.

Course Schedule

The tentative schedule can be found at http://www.cse.usf.edu/~haozheng/teach/cda4253/. It is subject to change during the semester.

Course Communication

There are places on the internet you need to access regularly throughout this semester. Canvas will be used for the course communications. The following Canvas modules will be used often throughout the semester.

- **Announcements** where all course related announcements are posted.
- **Assignments** where you download assignments descriptions and submit your solutions. *Submissions otherwise will be ignored.*
- **Grades** where grades for assignments, exam(s), and the final project are posted.
- **Discussions** where questions and answers that are of interest to the entire class are posted.

Other class material including lecture slides and course related documents will be available at

http://www.cse.usf.edu/~haozheng/teach/cda4253

In addition, your email inbox needs to be cleared because messages broadcast to the whole class will be sent out via announcements and/or emails. *You are responsible for not receiving emails due to the overflow of your email inbox.*

Academic Integrity/Academic Dishonesty

Students are expected to be honest and not cheat on their assignments/examinations/project. Collaborations by forming study groups and having discussions with fellow students are highly encouraged, but copying each other's work is forbidden. You must write *your own solutions* in *your own words*. If you are unable to find the solutions to problems without step-by-step help from your study partners, you do not understand the solutions.

Every student should read the University's policies on student conduct, academic integrity, etc. Please see the University's Undergraduate Catalog regarding these policies at http://regulationspolicies.usf.edu/regulations/pdfs/regulation-usf3.027.pdf. Students caught cheating in any form will receive an **FF** grade for the course.

Additional Policies

- Students are not allowed to sell or distribute notes provided for this class.
- Students in need of academic accommodations for a disability may consult with the office of Students with Disabilities Services to arrange appropriate accommodations. Students are required to give reasonable notice to the instructor prior to requesting an accommodation. If accommodations are needed, a letter from the Office of Student Disability Services (SVC 1133) is required.

- Students who anticipate the necessity of being absent from class due to the observation of a major religious observance must provide notice of the date(s) in writing by the second class meeting.
- The instructor reserves the right to interpret the class policies if confusions may occur.