CIS 6930-006 System-on-Chip Design

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Class Meeting Time/Location:	Tue. & Thr., $3:30 - 4:45pm$, ENG 3.
Credit Hours:	3
Office Hour:	$10 - 11:30am$, Tue & Thr., or by appointment.
Course Webpage:	Canvas
	http://www.cse.usf.edu/~zheng/teaching/soc

Course Description

This course introduces basic concepts, issues, and processes of electronic system designs that integrate both hardware and software by following a systematic hardware/software co-design and co-verification principle. It covers system modeling at different levels of abstraction, hardware/software partition and co-verification, high-level synthesis, hardware architectures, etc.

Prerequisites

It is highly desirable that you have successfully finished the main hardware and software related courses to have sufficient background for this course. Additionally, familiarity with C/C++ programming is required.

Textbooks

There is no required textbook for this class. However, the following books will be referenced to frequently throughout this course, and all of them can be accessed for free on campus network. It is recommended that you download a copy for each of them.

SystemC-1 *System Design with SystemC*, T. Groetker, S. Liao, G. Martin, S. Swan, Kluwer Academic Publishers, Boston, May 2002, ISBN 1-40207072-1, on-line accessible through USF Library.

SystemC-2 *SystemC: From the Ground Up*, D. Black, J. Donovan, B. Bunton, A. Keist ISBN: 978-0-387-69957-8 (Print) 978-0-387-69958-5 (Online), Springer, on-line accessible through USF Library.

CoDesign *A Practical Introduction to Hardware/Software Co-design*, P. Schaumont, Springer, 2009, ISBN: 978-1-4614-3736-9 (Print) 978-1-4614-3737-6 (Online), available on-line if you are on a campus network.

Embedded *Embedded System Design: Modeling, Synthesis, Verification*, D. Gajski, S. Abdi, A. Gerstlauer, G. Schirner, Springer 2009, ISBN: 978-1-4419-0503-1 (Print) 978-1-4419-0504-8 (Online), available on-line if you are on a campus network.

Zynq *The Zynq Book* and its companion tutorial, L. Crockett, R. Elliot, M. Enderwitz, R. Stewart, downloadable at http://www.zynqbook.com

Additional reading will be posted online as the course progresses.

Tentative Topics

- System design issues and methodologies
- System level modeling with SystemC
- Computational models of software and hardware
- Hardware/Software partitioning
- Hardware/Software interfacing
- Transforming software to cycle-based hardware implementation
- On-chip communication architectures
- FPGA prototyping (*if time allows*)

Grading

Evaluation

There will be $6 - 8$ homework/lab assignments and one final project. The grade distribution is shown below.

Assignments	Grades
Homework/Lab	60%
Final Project	40%

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 changes at the end of the semester.

Policy for Late/Missing Assignments

Late/missing submission of assignments will result in zero point for grade. The make-up for late/missing submissions is granted only when a **verifiable proof** such as a police report or a doctor's note showing some emergency is presented to the instructor.

Last day to drop with 'W': 10/29/2016

Course Communication

Canvas on my.usf.edu needs to be used for downloading assignments, submitting your solutions, checking your grades, and discussions.

Other course material including lecture slides, reading or other related course material should be found at http://www.cse.usf.edu/~zheng/teaching/soc

Also make sure that your email inbox is 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. Collaboration and discussion with fellow students are highly encouraged, but copying each other's work is forbidden. Every student should read the University's policies on student conduct, academic dishonesty, etc. Please see the University's Undergraduate Catalog regarding these policies at

- http://www.grad.usf.edu/catalog.php for graduate students.
- http://ugs.usf.edu/catalog/ for undergraduate students.

Students caught cheating in any form will receive an **FF** grade for the course.

General Policies

- Class Attendance is required although not actively monitored. Students are responsible for obtaining all information communicated in classes. The information covered may not be necessarily duplicated on the course webpages.

- Academic dishonesty will not be tolerated and the student, in question, will be dealt with in accordance with the University policies.

- Cell phones should be turned off at all times including exams and lectures.
  off during exams.

- Students are not allowed to sell or distribute notes provided for this class.

- Students with disabilities are encouraged to consult the Instructor as soon as possible. If accomodations are needed, a letter from the Office of Student Disability Services (SVC 1133) will be required. Please inform the Instructor if there is a need for alternate format for documents or notetaker.

- 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.