ECE 474a/574a: Computer-Aided Logic Design – Fall 2018

Time: Tuesday, Thursday, 11am – 12.15pm; Credits: 3
Location: Gittings 201
Prerequisites: ECE 275, ECE 274a

Instructor
Tosiron Adegbija (www.ece.arizona.edu/~tosiron), tosiron@email.arizona.edu
Office: ECE 356C; Office hours: Tuesdays, 3.30pm – 5pm, or by appointment

Course Websites
We will use Piazza for class resources, lecture notes, assignments, and discussion. The system is highly catered to getting you help fast and efficiently from classmates and myself. Unless you have questions specifically related to your grade, personal matters, or similar, you should post your questions to Piazza. Sign up link is on D2L. All enrolled students must sign up on Piazza. Grades, assignment submission, and class videos (posted after every class) will be on D2L: https://d2l.arizona.edu

Communication with the Instructor
For questions related to grades and personal matters, please email me. In your emails to me, please include the course number in brackets in your subject (i.e., [ECE 574A] or [ECE 474A]) so that I can sort my email.

Course Overview
This course is an introduction to Computer-Aided Logic Design. This is a highly-active research area, enabling the design of more complex digital systems. In this course we will focus on three areas: specification, optimization, and the use of software tools. The course will examine how to specify functionality at different abstractions, use industry-standard tools to synthesize and simulate hardware designs, and investigate some of the underlying optimization techniques utilized.

Topics include, but are not limited to:

- Hardware description languages (HDL)
- High-level synthesis (HLS): scheduling algorithms, resource sharing and binding, etc.
- Design and implementation of sequential circuits
- Register-transfer level (RTL) design
- Optimization and tradeoffs of combinational and sequential circuits
- Exact and heuristic minimization of two-level circuits, binary decision diagrams (BDD), etc.

Textbooks
There is no required textbook. The class is designed so that you don’t have to purchase any textbooks. However, the lecture notes are based on the following textbooks:

- Frank Vahid and Roman Lysecky, *Verilog for Digital Design*, John Wiley & Sons
- Frank Vahid, *Digital Design*, John Wiley & Sons
**Grading**

Grading for the class will be performed on an individual basis. You will not be competing with other students for your grade. Your grade is only dependent on the effort you put into the class. Letter grades will be assigned using a 10% scale:

- 90 – 100%: A
- 80 – 89%: B
- 70 – 79%: C
- 60 – 69%: D

The grading will be based on a weighted sum as follows:

- 25% - Midterm 1 *(tentatively on Thursday, October 18)*
- 25% - Midterm 2 (not cumulative) *(tentatively on Tuesday, December 4)*
- 30% - Programming assignments (3 in total; each lasting about one month)
- 10% - Homework assignments (approximately 4 in total; one every month)
- 10% - In-class participation, exercises, and impromptu quizzes *(you may miss up to 2 quizzes with no penalty)*

Assignments will feature additional components for ECE 574 students. All grades will be posted on D2L.

**Policies**

- *No academic dishonesty will be tolerated. Unless explicitly stated by the instructor, all course work should be done on your own. Please consult the UA Code of Academic Integrity.*
- Students are expected to read any assigned material *before* lecture.
- No late work will be accepted, unless in extraordinary circumstances, e.g., medical emergency, University/College approved absences, etc.
- Regrade requests must be submitted to me in writing within *three days* from return of exam/assignments, with a clear and concise reason for the request. Exams and assignments requested to be regraded will be regraded in their entirety.
- Missed exams can only be made up in case of documented illness or personal emergency. Please submit a written documentation (including supporting documentation) to me ASAP. When possible, make-up arrangements must be made prior to the scheduled activity.
- Attendance is not mandatory and I will not be taking roll. However, I highly recommend that you attend class regularly. Positive learning outcomes and good grades are highly correlated with consistent class attendance and in-person interactions with instructors during class and office hours.
- You are not allowed to use electronics (cell phones, laptops, etc.) during class except for class-related activities.

**Disability/Counseling Resources**

Students requesting classroom accommodation must register with the [Disability Resource Center](https://drc.arizona.edu) for assistance with obtaining the necessary accommodations, and request the DRC to send me official notification of your accommodation needs ASAP. Please plan to meet with me to discuss accommodations and how to maximize your productivity in this class.

Additionally, resources are available on campus to students having personal problems or lacking clear career and academic goals. Students who need assistance should contact [Counseling and Psych Services](https://counseling.arizona.edu) for the necessary assistance.

**Inclusive Excellence**

Inclusive Excellence is a fundamental part of the University of Arizona’s strategic plan and culture. As part of this initiative, the institution embraces and practices diversity and inclusiveness. These values are expected, respected and welcomed in this course.

*This syllabus is subject to change at the discretion of the instructor, with proper notice to the students.*