

# EE 4755—Digital Design using Hardware Description Languages

## Where/When/Web

Room 120 Tureaud Hall

☞ Check for room changes.

Mon Wed Fri 11:30–12:20 Fall 2020

<https://www.ece.lsu.edu/koppel/v/>

## Who

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Office Hours: Mon–Fri 15:40–16:40.

☞ Office hours are in-person when permitted, and via Zoom either way.

## Prerequisites

By Course: EE 3755.

By Topic: Logic design, computer organization, programming (C, C++, Java, etc.).

## ☞ CoViD-19

Changes in the format of the course may be made during the semester to adapt to the CoViD-19 pandemic. Advance notice will be given. See the next page for additional information.

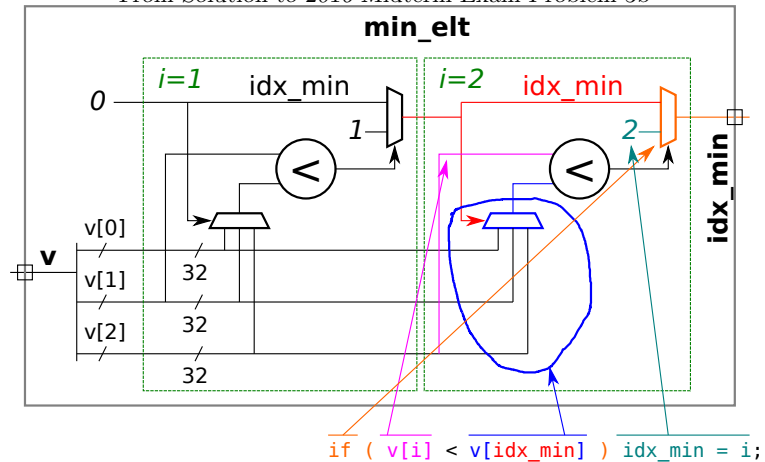
## Topics

- Electronic Design Automation Big Picture: from *simulation* to get it right, to *synthesis* to make it real, and the myriad other tools between to make it good.
- SystemVerilog: data types, object types, module instantiation, procedural code, event queue and simulation timing, testbench coding.
- Synthesis Tool Usage: Design targets, timing and area constraints, design tuning, scripting.
- Inference of hardware by synthesis programs for structural and behavioral code.
- Combinational Logic Descriptions: linear and recursive structures.
- Sequential Logic Descriptions: counter-like, pipelined, state-machine controlled, etc.
- Software: Cadence Incisive Enterprise Simulation (SystemVerilog simulation), Encounter RTL computer (SystemVerilog Synthesis), TCL (synthesis scripting).

**Texts** *IEEE Standard for SystemVerilog—Unified Hardware Design, Specification, and Verification Language, IEEE 1800-2017*. (For a free copy visit <https://ieeexplore.ieee.org/document/8299595/>.) For those who need to review digital logic and basic Verilog: Brown & Vranesic, “Fundamentals of Digital Logic with Verilog Design” (The text used in EE 2741 and 2742.)

**Grading** Homework assignments, including HDL coding assignments, 30%; Midterm Exam, 35%; Final Exam, 35%. Midterm exam grade may be replaced with final exam grade if that improves average. Plus/minus grading will be used. Late-homework penalty: 10% per day late deducted. Missed-midterm-exam policy: at instructor’s discretion either a makeup exam, use final exam grade for midterm grade (*i.e.*, 70% final exam weight), or use zero for midterm grade. Daily attendance: optional, however students are responsible for all material, instructions, and notices presented in class whether in person or held remotely.

From Solution to 2016 Midterm Exam Problem 3b



## **A.D.A.**

Louisiana State University is committed to providing reasonable accommodations for all persons with disabilities. This syllabus is available in alternate formats upon request. Any student with a documented disability needing academic adjustments is requested to speak with Disability Services and the instructor, as early in the semester as possible. All discussions will remain confidential. Please contact Disability Services in 115 Johnston Hall, 225-578-5919 or at <https://www.lsu.edu/disability>.

## **🚫 Computer Assignments**

Many assignments for this course will have to be completed on computers in the ECE Workstation Lab, which are in room 2241 Patrick F. Taylor Hall. These machines can be used directly (within room 2241) or remotely, see the class procedures page for instructions. It is preferred that students use these computers directly since that facilitates inter-student discussion and provides the best experience when using graphical tools.

When in the ECE Workstation Lab students are expected to comply with LSU social distancing guidelines. Be sure to use hand sanitizer both before arriving at and after finishing with a workstation. Take care that a cry of computer-stoked frustration does not launch a virus-laden plume toward some other person. Remember that CoViD-19 has spread widely because many of the infectious are infectious without being aware of any symptoms at all.

## **🚫 CoViD-19 Statement**

We remain under pandemic conditions and expect to be in this state for the entire semester. In order to consistently provide the highest quality LSU education, all students should follow current LSU guidelines. These include the following:

- 1 If you have any signs of illness, do not come to class.
- 2 In order to protect all campus community members, the University requires everyone to wear face-masks/cloths on campus. Failure to do so is a violation of the code of student conduct.
- 3 Wash hands with soap and water or clean with sanitizer frequently, and refrain from touching your face.
- 4 If you have to cough or sneeze, please be mindful of others nearby and cough or sneeze into your elbow or shield yourself the best you can.
- 5 If you have been exposed to others who have tested positive for CoViD-19, self-quarantine consistent with current CDC guidelines.

## **🚫 Daily Symptom Checker**

You are required to respond to a daily symptom check request sent via email or text message each morning. Completing the symptom checker will take approximately one to two minutes. Once you have provided information about your symptoms, you will be given feedback on whether or not you are certified to return to campus and attend your classes. Additionally, if you test positive for CoViD-19, you are required to report it in your daily symptom checker application.

## **🚫 Resources for Students**

Your health and safety are LSU's top priority. If you are feeling ill or overwhelmed with anxiety, please contact the LSU Student Health Center for medical advice and mental health support. General health care and mental health support are available for all enrolled students through telehealth appointments.