The Laboratory SYLLABUS for ECE 2060 / 2067
Introduction to Digital Logic
Autumn Semester 2024

Catalog Description:

- Accompanies and complements the material covered in ECE 2060 by introducing digital circuit design and implementation of an FPGA based digital design of a 4-light state machine game.

- Instruction in the design of FPGA based elementary and intermediate digital circuits

- Introduction to VHDL hardware design language.

- Introduction to the Intel Quartus Prime v 18.1 FPGA Development Platform and DE2-115 Cyclone IV E FPGA development board.

Lab Supervisor:

Dr. Gregg Chapman
chapman.415@osu.edu
Caldwell Lab 249 (close to the lab)
Office hours: By appointment

Lab Teaching Assistants:

Abdullah Etcibasi etcibasi.1@osu.edu   (11144/9089, 9147, 11039)

Hamza Salam salem.97@osu.edu   (9146, 9148, 9149)

Lab Location: Caldwell Labs, Room 237

Office hours: Please contact your Teaching Assistant to make special arrangements.

Lab Monitors: To Be Determined.

Material:

- Lab instructions, manuals, forms, screencasts, and lab report instructions and format are ALL available at the course website -
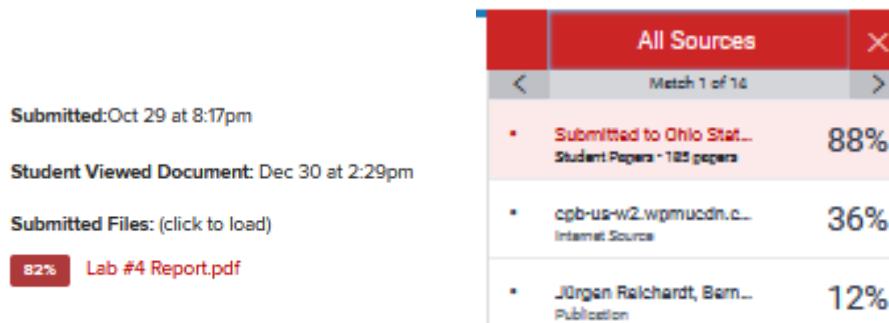
    https://u.osu.edu/ece2060labs

- All equipment for ECE 2060 is supplied in the laboratory.

- Each laboratory is accompanied by video presentations (at u.osu.edu/ece2060labs).

GRADING

- Your final lab grade is 20% of your overall course grade for ECE 2060

- Each lab is worth 20 points.

    – **Checkpoints** (completed during the lab) **10 points**

    – **Lab Reports 10 points**

- Reports are due the Friday, by midnight, of the week after the lab is performed.

- **IF YOU SUMBIT A LABORATORY REPORT THAT IS NOT A SINGLE .PDF DOCUMENT, IT WILL NOT BE GRADED AND YOU WILL RECEIVE A ZERO FOR THE SUBMISSION.**

- Your lowest *lab report* grade will be dropped. *NO lab checkpoints are dropped.*

- *If you do not attend a lab or make up the missed lab section, you are not eligible to submit a lab report., You will receive a grade of 'zero' for both the Checkpoints and the Lab Report. Your lab partners are still required to submit a report but only they will be graded for the lab.*

- There is no midterm or final examination for the lab portion of the course.

PLAGIARISM

- Plagiarism is the act of submitting written academic material, that you are representing as your own work, when it is actually copied, in part or in whole, from another person's written work. This can be another lab group, an individual, or copies of course material from the instructor or professor.

- You should be aware that there is a *Turnitin ™* software application that compares every submission in the laboratories to previously submitted documents, lab instructions, and documents that have been posted on the internet (e.g. CourseHero). This application reports the percentage of your document that matches documents as far back as 10 years. Because there is a good deal of commonality in laboratory reports, it is not unusual to have a 40-50% commonality with previous submissions. A plagiarized lab report rating from *Turnitin ™* appears below.

Submitted: Oct 29 at 8:17pm

Student Viewed Document: Dec 30 at 2:29pm

Submitted Files: (click to load)

82% Lab #4 Report.pdf

All Sources	✕
Match 1 of 14	
Submitted to Ohio Stat... Student Papers · 185 papers	88%
cpb-us-w2.wpmucdn.c... Internet Source	36%
Jürgen Reichardt, Bern... Publication	12%

3. Button Debounce circuit with Stretch Timer schematic

Open the latest SimonGame project that has the button debounce circuit. Create the stretch timer and stretch counter in the ButtonDebounce block diagram file. In order to observe the effect of the pulse stretch timer, set the comparator value of the Stretch Timer to have a delay of one second. Do this by setting the constant value in the Stretch Compare megafunction to 48000. Update the symbol file and delete and replace the old Button Debounce symbol at the top-level. Connect the AUD_DACLRCK to the clock input of the new Button Debounce symbol. Connect the Simon Box to the DE2 board. Compile and program the project with the modified debounce circuit. Observe the one second delay when you press the buttons. Calculate the correct comparator value to set the pulse stretch delay down to 150 milliseconds. Recompile the schematic, update the symbol, and, again, replace the block on the top-level schematic.

- **IF YOUR SUBMBUSSION IS RATED AT 75-100% BY THE TURNITIN SOFTWARE, YOU WILL AUTOMATICALLY RECEIVE A GRADE OF ZERO FOR THE REPORT.** YOU MAY ALSO BE REPORTED TO THE COMMITTEE ON ACADEMIC MISCONDUCT (COAM).

- You are **NOT** permitted to copy **ANY** content from the Lab Instructions file (ReadMeFirst) without referencing the image or text with a footnote and stating that it was taken from the Lab Instructions. You must also provide a reference for the Lab Instructions at the end of the report. If you do not do this, the result is plagiarism.

LABS and SCHEDULE:

Labs will meet each week this semester beginning on TUESDAY *September 17th*. Please verify your lab day and meeting time using the Lab Course # in Carmen

Day	Meeting Time	Carmen Course #	GTA
Tuesday	8:00-11:00	11144/9089	Abdullah Etcibasi
Tuesday	11:15-2:15	9149	Hamza Salem
Wednesday	11:15-2:15	9146	Hamza Salem
Wednesday	5:45-8:45	9147	Abdullah Etcibasi
Thursday	8:00-11:00	11039	Abdullah Etcibasi
Friday	11:15-2:15	9148	Hamza Salem

Date	Lab	Title
September 17-20	Lab 1	Quartus Prime and the DE2 Board
September 24-27	Lab 2	ModelSim and VHDL
October 1-4	Lab 3	Encoders and Decoders
October 8-11	NO LABS	**Autumn Break Week**
October 15-18	Lab 4	Latches and Flip-Flops
October 22-25	Lab 5	Counters
Oct. 29-Nov. 1	Lab 6	The Audio Synthesizer
November 5-8	Lab 7	The Simon State Machine - Part 1
November 12-15	Lab 8	The Simon State Machine - Part 2

LABORATORY POLICIES:

- You **MUST** attend the lab section that you enrolled.

- You may work in Lab Groups of two or three students.

- **Checkpoints:**

  - **YOU MUST VERIFY THAT ALL OF _YOUR_ CHECKPOINTS ARE RECORDED IN THE NOTEBOOK PRIOR TO LEAVING THE LAB. _You must SIGN the Checkpoint Sheet as part of the last Clean-up Checkpoint. By this action, you are agreeing that the Checkpoint sheet is correct._**

  - **YOU CANNOT Receive CHECKPOINTS after leaving the lab session.**

  - **_NEVER, EVER_ RELY ON THE WORD OF A LAB MONITOR WHEN THEY TELL YOU THAT THEY WILL MARK YOUR CHECKPOINT! _They are extremely busy and WILL forget to do it._ They have been instructed NOT to tell students that they will do it later.**

- **Please come to lab prepared.** This means that you have reviewed all videos and documents on the ECE2060Labs website prior to your lab session.

- **No food or liquids are EVER allowed at the lab bench.**

- Due to the sequential nature of the ECE 2060 laboratories, a lab cannot be performed unless all previous labs have been performed. Students will always perform the eight labs in order.

- Students who do not attend a live laboratory session are not eligible to submit a lab report.

- Late lab reports will not be graded.

- **You are permitted to make up one missed lab per semester.**

  - **Exception:** MIDTERMS AND OTHER TESTING CONFLICTS ARE NOT PERMITTED BY THE UNIVERSITY AND MUST BE RESOLVED BY YOUR PROFESSOR SHOULD THEY SCHEDULE TESTING DURING YOUR ENROLLED LABORATORY TIME. YOU WILL NOT BE PERMITTED TO MAKE UP A LAB TO ATTEND A MIDTERM. YOUR PROFESSOR IS REQUIRED TO OFFER YOU AN ALTERNATE TIME IF THEY SCHDULE A MIDTERM DURING YOUR LABORATORY MEETING TIME.

- Make-up labs cannot be performed any later than **_Friday November 22nd_ .**

- **_Your GTA will schedule the make-up lab. It is best to make up the lab before your next regular lab session, or you will fall progressively behind in the lab sequence._**

NOTE 1: Any interpretation of the syllabus, in part or in its entirety, that conflicts with the original intention of the instructor is not valid and will not be taken into consideration.

NOTE 2: Any petition to change the policy will not be considered during the course of the semester. If a situation is explicitly discussed in this syllabus, a response to emails requesting an exception will refer you to the syllabus.

NOTE 3: In the event that another document contradicts the syllabus, the syllabus will take precedent.

NOTE 4: By enrolling in ECE 2060 or 2067 you are agreeing to take the laboratory portion of the course as defined in this document without challenging any of the stated policies.

- **Disabilities Statement**

   Any student who feels s/he may need an accommodation based on the impact of a disability should contact the instructor privately to discuss specific needs. Please contact the OSU Office for Disability

   Services for assistance in verifying the need for accommodations and developing accommodation strategies.

- **Academic Misconduct Statement**

   Any student found to have engaged in academic misconduct, as set forth in the Code of Student Conduct Section 3335-23-04, Prohibited Conduct, will be subject to disciplinary action by the university.
   Academic misconduct is any activity that tends to compromise the academic integrity of the university, or subvert the educational process. Using or uploading ECE 2060 course material on non-OSU websites is considered academic misconduct and will be prosecuted as such.

- **Student Conduct**

   Students are expected to abide by the provisions in the Code of Student Conduct. The University's Code of Student Conduct and Sexual Harassment Policy are available on the OSU Web page.

   Using or uploading ECE 2060 course material on non-OSU websites is considered academic misconduct and will be reported to the Counsel on Academic Misconduct.

Health and safety requirements
All students, faculty and staff are required to comply with and stay up to date on all university safety and health guidance (https://safeandhealthy.osu.edu), which includes wearing a face mask in any indoor space and maintaining a safe physical distance at all times. Non-compliance will be warned first, and disciplinary actions will be taken for repeated offenses.

Carmen access
You will need to use BuckeyePass multi-factor authentication to access your courses in Carmen. To ensure

that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the Duo Mobile application to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.
- If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will work out a solution with you.

Course Technology Resources

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. Standard support hours are available at ocio.osu.edu/help/hours, and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** ocio.osu.edu/help
- **Phone:** 614-688-4357(HELP)
- **Email:** servicedesk@osu.edu
- **TDD:** 614-688-8743

Baseline technical skills for online courses

- Basic computer and web-browsing skills
- Navigating Carmen: for questions about specific functionality, see the Canvas Student Guide.

Required Technology skills specific to this course

- CarmenZoom virtual meetings

Required equipment

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone
- Other: a mobile device (smartphone or tablet) or landline to use for BuckeyePass authentication

Required software

- Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found at go.osu.edu/office365help.

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Accessibility Accommodations for Students with Disabilities

Requesting accommodations

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical

conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** slds@osu.edu; 614-292-3307; 098 Baker Hall, 113 W. 12th Avenue.

Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- CarmenCanvas accessibility
- Streaming audio and video
- CarmenZoom accessibility
- Collaborative course tools

Ohio State Academic Integrity Policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the university's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages (COAM Home)
- *Ten Suggestions for Preserving Academic Integrity (Ten Suggestions)*
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

Statement on Title IX

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender,

including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options at titleix.osu.edu or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu. Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin, and disability. For more information on OIE, visit equity.osu.edu or email equity@osu.edu.

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learn, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you find yourself feeling isolated, anxious or overwhelmed, please know that there are resources to help: ccs.osu.edu. You can reach an on-call counselor when CCS is closed at (614) 292-5766 and 24 hour emergency help is also available through the 24/7 National Prevention Hotline at 1-(800)-273-TALK or at suicidepreventionlifeline.org. The Ohio State Wellness app is also a great resource available at go.osu.edu/wellnessapp.

Student Emergency Financial Support

The **Student Advocacy Center** staff members are continuing to serve students during normal business hours and are accepting online appointments.

The **Student Emergency Fund** is available to students who may otherwise be at risk of dropping out of college due to an unexpected financial emergency. If you, or a student you know, are experiencing an unplanned expense, the Student Emergency Fund may be an option. Their office is accepting applications and may be able to award up to $1,000 to eligible students. **Learn more and apply**.

The Together As Buckeyes emergency grants program, funded primarily by the federal Coronavirus Aid, Relief and Economic Security (CARES) Act, is available to all students — undergraduate, graduate, and professional — through the Student Financial Aid office. To apply for a grant, students need to complete a one-page Emergency Request form and provide any supporting documentation. The Office of Student Financial Aid will process applications after determining eligibility based on each student's circumstances and guidance from the U.S. Department of Education.

Franklin County Department of Job and Family Services has amended its Prevention, Retention and Contingency Program to provide targeted relief for families impacted by the COVID-19 pandemic. The Franklin County COVID-19 Response PRC Program provides eligible families with $500 in one-time cash assistance to help address emergent needs and expenses brought about by the public health emergency. Families can apply online today.

The **Student Wellness Center** offers financial coaching through the Scarlet and Gray Financial nationally recognized peer financial coaching program. Through the program, students will learn about financial goal setting, banking basics, budgeting, credit education, debt repayment education and saving and retirement education. Learn more.

Food Assistance

It is a common idea that pervades American culture: when you are in college, it is simply a rite of passage to sustain yourself on cheap, unhealthy food. We disagree. We highly recommend OSU's **Buckeye Food Alliance** Lincoln Tower 150 food pantry (https://www.buckeyefoodalliance.org) and the MidOhio Foodbank (https://www.midohiofoodbank.org). The **Buckeye Food Alliance** will remain open to support students in need. Starting Monday, March 23 the pantry will be open Monday/Thursday 10 a.m. – 2 p.m.; Tuesday/Wednesday 4 – 8 p.m. and Friday 11 a.m. – 3 p.m. If these times do not work for your schedule, you can schedule a special appointment by contacting Nick Fowler at fowler.318@osu.edu.

v August 20, 2020

ECE Diversity and Antiracism Statement

Success in engineering requires multiple perspectives, a wide range of expertise, and diverse backgrounds to solve societal problems and advance science. To be a student, faculty, or staff member in the Department of Electrical and Computer Engineering means being innately tied to a rich tapestry of diverse cultures, ethnicities, and backgrounds through people from all over the world. ECE faculty and staff aspire to hear the voices of those disenfranchised by racism. As educators and mentors within ECE, we will promote a culture of care. We are working to become better allies to create a safer society for everyone, and to invite all of our students, staff, and faculty to be courageous, take a stand against racism, and condemn any form of racial injustice. Not only do we help cultivate diversity in ECE, we celebrate it.

The Office of Institutional Equity (OIE) at Ohio State responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin, and disability. For more information on OIE, visit equity.osu.edu or email equity@osu.edu.

Counseling and Consultation Services

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling **614-292-5766**. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at **614-292-5766** and 24-hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at **1-800-273-TALK** or at suicidepreventionlifeline.org.

The ECE website also offers a listing of student wellness and support services available at Ohio State.