

**The Laboratory SYLLABUS for ECE 2060**  
**Introduction to Digital Logic**  
**Spring Semester 2021**

**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 use of electrical instruments such as oscilloscopes, function generators and digital multi-meters.
- 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](mailto:chapman.415@osu.edu)  
Caldwell Lab 249 (close to the lab)  
Office hours: By appointment

**Lab Teaching Assistants:**

Ananya Mahant                      [mahanti.1@osu.edu](mailto:mahanti.1@osu.edu)  
Ryan Patton                            [patton.301@osu.edu](mailto:patton.301@osu.edu)

**Lab Location:** Caldwell Labs, Room 237

**Office hours:** You must contact the Teaching Assistant to make special arrangements to meet due to the COVID-19 Pandemic.

**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>

- **NOTE: All students and staff must watch the Laboratory PPE Training Video prior to coming to their first live lab.**
- All equipment for ECE 2060 is supplied in the laboratory.
- Each laboratory is accompanied by video presentations (at [u.osu.edu/ece2060labs](https://u.osu.edu/ece2060labs)).

### Grading:

- Your final lab grade is 20% of your overall course grade
- 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.
- There is no midterm or final examination for the lab portion of the course.

### IMPORTANT DATES:

- The Lab material begins on **January 11<sup>th</sup>** with two **VIRTUAL** assignments:
  - Assignment 1 – Download Quartus Prime II v 18.1
    - Complete **BEFORE January 18<sup>th</sup>**
    - No Lab Report
  - Laboratory 1- Complete **BEFORE February 1<sup>st</sup>**.
    - Lab report is due for **EVERYONE BEFORE February 6<sup>th</sup>**.
- **LIVE Labs** begin on **Monday, February 1<sup>st</sup>**.
  - **SEE SCHEDULE FOR YOUR DAY AND TIME**

### The Labs:

Assignment 1: Download Quartus Prime II Version 18.1

Lab 1: Quartus Prime and ModelSim

Lab 2: The DE2-115 Hardware, Hierarchical Design, Intro to VHDL

Lab 3: Latches and Flip-Flops

Lab 4: Counters

Lab 5: The Audio Synthesizer

Lab 6: The Simon State Machine

## LAB SCHEDULE:

You must be enrolled in one of the following section number in addition to Lecture. All sections have been limited to 40 students.

ECE 2060 Laboratories										
LAB Course # in Carmen	GTA	Lab Group	Time	Assignment 1 *	Lab 1 *	Lab 2	Lab 3	Lab 4	Lab 5	Lab 6
33974	Ananya Mahanti	Group A, Monday	8:00-11:00	Before 18-Jan	Before 1-Feb	1-Feb	15-Feb	1-Mar	15-Mar	29-Mar
33975	Ananya Mahanti	Group B, Monday	8:00-11:00	Before 18-Jan	Before 1-Feb	8-Feb	22-Feb	8-Mar	22-Mar	5-Apr
33976	Ananya Mahanti	Group A, Tuesday	8:00-11:00	Before 18-Jan	Before 1-Feb	2-Feb	16-Feb	9-Mar	23-Mar	6-Apr
33977	Ananya Mahanti	Group B, Tuesday	8:00-11:00	Before 18-Jan	Before 1-Feb	9-Feb	2-Mar	16-Mar	30-Mar	13-Apr
33980	Ananya Mahanti	Group A, Wednesday	11:15-2:15	Before 18-Jan	Before 1-Feb	3-Feb	17-Feb	10-Mar	24-Mar	14-Apr
33982	Ananya Mahanti	Group B, Wednesday	11:15-2:15	Before 18-Jan	Before 1-Feb	10-Feb	3-Mar	17-Mar	7-Apr	21-Apr
9669	Ryan Patton	Group A, Wednesday	2:30-5:30	Before 18-Jan	Before 1-Feb	3-Feb	17-Feb	10-Mar	24-Mar	14-Apr
33983	Ryan Patton	Group A, Wednesday	5:45-8:45	Before 18-Jan	Before 1-Feb	3-Feb	17-Feb	10-Mar	24-Mar	14-Apr
33984	Ryan Patton	Group B, Wednesday	5:45-8:45	Before 18-Jan	Before 1-Feb	10-Feb	3-Mar	17-Mar	7-Apr	21-Apr
33986	Ryan Patton	Group B, Friday	8:00-11:00	Before 18-Jan	Before 1-Feb	12-Feb	26-Feb	12-Mar	26-Mar	9-Apr
33987, 35223	Ryan Patton	Group A, Friday	5:45-8:45	Before 18-Jan	Before 1-Feb	5-Feb	19-Feb	5-Mar	19-Mar	2-Apr
33988	Ryan Patton	Group B, Friday	5:45-8:45	Before 18-Jan	Before 1-Feb	12-Feb	26-Feb	12-Mar	26-Mar	9-Apr

### Please NOTE THE FOLLOWING COVID-19 PANDEMIC POLICIES:

- You must sign in on the **LAB ROSTER** each time that you attend a live lab. If your name is not on the **LAB ROSTER**, you will not be permitted to perform the lab during that session. You must leave the lab area and return on the correct date and time indicated in the preceding table. Your Day, Time, and Lab Group (A or B) is based on the **CARMEN COURSE NUMBER THAT YOU SIGNED UP FOR ON YOUR SCHEDULE. YOU MUST KNOW THIS NUMBER.**
- You must complete at least three laboratories and corresponding lab reports in order to receive any of your lab grades.
- Because students are performing fewer than the usual number of required labs, no labs can be dropped.
- 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 six labs in order.
- Students who do not attend a live laboratory session are not eligible to submit a lab report.
- Lab reports are due on Friday by midnight of the week following the week that you performed the lab.
- For **Lab 1** (virtual lab), the Lab Report is due by Midnight on Friday, **February 5<sup>th</sup>**. This applies to **ALL SECTIONS.**
- If you are quarantined for COVID-19 after attending a live lab, the report is still due at the normal due date since it can be submitted online.
- Late lab reports will not be graded.
- If you are placed in quarantine before attending a live lab, you may make up the lab once you are out of quarantine. To do so, you must provide documentation from the University verifying the quarantine order.

- You may only make up one lab during the semester. It is the only way to complete all 6 labs. You must make up the missed lab within 7 days of being released from quarantine, or missing a lab for any other reason (see below).
- If you must miss more than one lab for COVID-19 quarantine and cannot make up the labs, you will receive an Incomplete grade for the course, and be given the opportunity to make up the labs during the next semester.
- If you must miss a lab for reasons other than COVID-19 quarantine, you must receive permission from Dr. Chapman directly to be allowed to make up the lab. Other illnesses and live interviews are the only two excuses that Dr. Chapman will permit. Either excuse requires written documentation. You must make up the lab within 7 days of your regularly scheduled lab section.
- Live labs and make-up labs cannot be performed any later than April 21<sup>st</sup>. Students quarantined past that date, or otherwise unable to conduct a make-up lab before April 21<sup>st</sup>, will receive an Incomplete in the course and have to make up the lab in a later semester.

**SPECIAL COVID-19 Pandemic Policies (For your protection):**

- 1) Each course will have one virtual assignment, one virtual lab, and 5 live (in person) laboratories located in Caldwell 237.
- 2) Students will attend live labs every other (alternating) week.
- 3) No more than 40 students will be in the lab during one session.
- 4) During live labs, all students and staff must maintain social distancing of 6 feet at all times.
- 5) Each student will have their own lab bench.
- 6) There are no lab partners this semester.
- 7) Each student and staff member must wear a face mask.
- 8) Students and staff members must wear disposable gloves at all times in the laboratory. This is because we can only clean equipment once a day.
- 9) Laboratory bench surfaces and equipment are disinfected once each day, after the final lab session with a 99% isopropyl alcohol mist. This is performed by the lab staff.
- 10) All students must watch the PPE Training Video available on the lab website before attending their first lab.

**Checkpoints:**

- YOU CANNOT Receive CHECKPOINTS after leaving the lab.

- **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.***

**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.**

### **Other Lab Policies**

- Please come to lab prepared. This means that you have reviewed all videos and documents on the ECE2060Labs website.
- No food or liquids are **EVER** allowed at the lab bench. Due to the COVID-19 Pandemic, the student lounge is closed.
- There will be one trash can for the disposal of gloves when you exit the lab.
- **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.

***NEW: 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.***

**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

## 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](https://ocio.osu.edu/help/hours), and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** [ocio.osu.edu/help](https://ocio.osu.edu/help)
- **Phone:** 614-688-4357(HELP)
- **Email:** [servicedesk@osu.edu](mailto: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](http://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](mailto:slds@osu.edu); 614-292-3307; 098 Baker Hall, 113 W. 12<sup>th</sup> 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](http://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](http://titleix.osu.edu) or by contacting the Ohio State Title IX Coordinator at [titleix@osu.edu](mailto: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](http://equity.osu.edu) or email [equity@osu.edu](mailto:equity@osu.edu).

## Your Mental Health

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 find yourself feeling isolated, anxious or overwhelmed, please know that there are resources to help: [ccs.osu.edu](http://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](http://suicidepreventionlifeline.org). The Ohio State Wellness app is also a great resource available at [go.osu.edu/wellnessapp](http://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](mailto: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](http://equity.osu.edu) or email [equity@osu.edu](mailto: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](http://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](http://suicidepreventionlifeline.org).

*The ECE website also offers a listing of [student wellness and support services](#) available at Ohio State.*

