FALL 2024

ECE 110
INTRODUCTION TO ELECTRONICS

COURSE SYLLABUS

Official Description: 3 hours credit

Introduction to selected fundamental concepts and principles in electrical engineering. Emphasis on measurement, modeling, and analysis of circuits and electronics while introducing numerous applications. Includes sub-discipline topics of electrical and computer engineering, for example, electromagnetics, control, signal processing, microelectronics, communications, and scientific computing basics. Lab work incorporates sensors and motors into an autonomous moving vehicle, designed and constructed to perform tasks jointly determined by the instructors and students. *Class Schedule Information*: Students must register for one lab and one lecture section. *Course Director*: J. K. Schuh

Course Websites **https://canvas.illinois.edu/**

Technology

Required: Computer to view and print (or markup) PDFs, view video lectures, and operate components from the ECE110 Electronics Kit. Record and submit short video segments for some laboratory assignments. Ability to complete online PrairieLearn exercises and exams. Hand-written exercises will be required (except for explicit DRES accommodations). Exam proctoring via the Computer-Based Testing Facility *may* require the use of a Zoom-connected smartphone. **Recommended**: A video option during Zoom interactions for increased community building.

Required Course Materials

- **Lecture Handouts** available online at https://courses.engr.illinois.edu/ece110. Hardcopy available at IUB.
- **Laboratory Manuals** available online on Canvas
- **ECE 110 Electronics Kit** ordered from ECE Supply Center
- **ECE 110 Class Notes** Textbook available online on Canvas

Optional Course Materials

- **Recommended:** Arduino or RedBoard (for self-selected activities), wire stripper, soldering iron. Lecture handout hardcopy from IUB.

Lecture Schedule

Section	Days	Time		Instructor	Email
AL2	Mondays & Wednesdays	10:00-10:50 am	1002 ECEB	Prof. Chris Schmitz	cdschmit@illinois.edu
AL3	Beginning Wednesday January 22	2:00-2:50 pm	1002 ECEB	Prof. Jonathon Schuh	schuh4@illinois.edu
AL4		3:00-3:50 pm	1002 ECEB	Prof. Venugopal Gomathi	gomathiv@illinois.edu
	All times Central				

Laboratory Meeting Schedule

Inclusive Dates	Exclusive Dates	Classroom	Lab Director
Start: January 27 (Mon) ***End:*** May 2 (Fri)	Teams will meet face-to-face the first week of the class, but will not meet the last partial week of class. There are no classes or lab meetings for any course during fall break.	***1001 ECEB … Enter through 1005 ECEB***	Prof. Schuh
Notes: *Always read the laboratory assignment before your laboratory meeting*. All laboratory meetings are **mandatory**. See the absence policy. Some meetings will be team lead while some meetings will be TA lead. A schedule and more details will be provided.			

Students will be assigned to teams of 4 which are required to meet in addition to in the physical lab space. Teams will be assigned randomly and no requests for specific teammates will be accommodated.

Lecture Attendance Policy

Engagement is significantly enhanced through the live interaction and group activities will be pursued by some instructors during the lecture sessions. Regular attendance has been seen to raise grades and create better interactions during in-lecture exercises. **Lecture attendance is worth 1% of the final grade. You must attend 80% of the total lectures to receive this. Attending less than 80% of the lectures will earn a pro-rated percentage of the lecture credit (Attendance/(80% of Lectures)*1%).**

NOTE: Students MUST attend the lecture that they are registered for to receive lecture attendance credit.

Laboratory Attendance Policy

With the few explicit exceptions listed before, laboratory attendance is mandatory each week. If you have an unavoidable medical or personal emergency, contact your lab partners and your TA (not your lecture instructor) ***in advance*** or as soon as possible to make alternate arrangements. You and your lab team are responsible for meeting for activities outside of the regular laboratory meetings.

NOTE: Contacting your lab TA AFTER your lab has started is an unexcused absence.

Homework

HOMEWORK DEADLINE	Homework will be due **Thursdays** at **11:59 pm Central Time** unless stated otherwise

Homework problems are on-line through PrairieLearn and GradeScope. When you submit answers in PrairieLearn, they are graded immediately (computer-graded). GradeScope will require human grading. There is no partial credit for homework completed after the deadline. **Students will not be reminded about due dates**. **Students will have to add themselves to Gradescope with the entry code given on Canvas**. You should work regularly and in an organized manner. It is recommended that you begin a homework set immediately following the lecture covering that material.

NOTE: Gradescope homework solutions must be handwritten. Typed solutions will receive 0 credit. **Assume that any number given in the homework has AT LEAST 3 sig figs. Always report numbers to AT LEAST 3 sig figs.**

Office Hours Schedule

Regular Dates	Classroom	Reading Day	Office Hours Contact
Start: Tuesday, Jan 28 ***End:*** Last Wed of term ***Exception:*** Breaks	1005 ECEB and ONLINE	Thursday, May 8 *A new schedule will be used from this date on.*	schuh4@illinois.edu
Notes: The official office hour schedule will be posted at our course website. *Questions or concerns?* You may go to any office hours that fit in your schedule. You *must* show your attempt in written form to receive office hour assistance on a specific problem!			

Lab Office Hours

Typically Saturday 12-2pm the lab is available for students to play with course-defined mini-projects or final-projects as well as any personal projects (deemed safe by the TAs). We hope to continue this tradition with in-the-lab offerings!

Quizzes (Confirmed!)

Q1 (PL)	Q2 (PL)	Q3 (PL)	Location for all:
Mon-Wed Feb 24-26	*Mon-Wed Mar 31-Apr 2*	*Mon-Wed Apr 28-30*	*CBTF (In-Person)*

This course uses the College of Engineering Computer-Based Testing Facility (CBTF) for its quizzes and exams: https://cbtf.engr.illinois.edu.

Students will need to login to https://cbtf.engr.illinois.edu/sched which will cause the CBTF to automatically find your roster affiliation to courses. You should then receive reminder emails when new exams become available to reserve. Please login at the start of the semester, even if you cannot make a reservation for any quiz yet.

The student instructions section of https://cbtf.engr.illinois.edu/ should be reviewed. It has guides for the CBTF policies, what to do if an exam is missed, how to get support, etc.

The policies of the CBTF are the policies of this course, and academic integrity infractions related to the CBTF are infractions in this course.

If you have accommodations identified by the Division of Rehabilitation-Education Services (DRES) for exams, please take your Letter of Accommodation (LOA) to the CBTF proctors in person before you make your first exam reservation. The proctors will advise you as to whether the CBTF provides your accommodations or whether you will need to make other arrangements with your instructor.

Any problem with testing in the CBTF **must** be reported to CBTF staff at the time the problem occurs. If you do not inform a proctor of a problem during the test then you **forfeit** all rights to redress.

Second-Chance Testing

We are offering second-chance testing following the quizzes in the fall of 2023. This opportunity to boost weak quiz scores will only be given to students who have already demonstrated commitment to the material through their *achieving a minimum of 75% on the corresponding section review*. More information will be provided through the course website.

Quiz retries are the week immediately after the quiz. See the course calendar for more information.

Review Sessions

HKN (Eta Kappa Nu Honor Society) typically offers reviews prior to the quizzes and final exam for ECE 110. These will be announced through the course announcements.

Final Examination - 3 hours

Final Exam (PL)	Location:
3 options: *TBD*	*CBTF*

(Dates TBD) The final exam is much like the quizzes. You may not receive any human assistance or use any other tool besides a calculator. The conflict is allowed ***only*** with a valid reason. It will last 180 minutes.

Examination Policy

Academic integrity must be maintained throughout the semester. The website https://cbtf.engr.illinois.edu/index.html documents the CBTF for students as well as special instructions for DRES accommodations. If you have an unavoidable medical or personal emergency, the course director may be able to allow for a conflict. To be eligible, you must notify your lecture instructor (not a TA) immediately, and you must document your absence as best you can.

Getting Help!

For general assistance with the undergraduate curriculum, visit the *ECE Department Advising Office* in the administrative suite room 2120 ECEB (for academic advice), the Center for Academic Resources in Engineering 4th floor of Grainger Library (CARE, for engineering-course-related help), or the campus's *Counseling Center* (for time management, study skills, test taking skills, and confidential personal counseling). For assistance in ECE110 specifically, please see your instructor or the course director.

- **Instructors, TAs, undergraduate Course Aides:** See office hours.
- **Supervised Study Sessions:** Peer-team study (watch for announcements).
- **Tutoring:** Watch for announcements from class or check with IEEE/HKN, Tau Beta Pi, Women in Engineering (WIE), Women in Electrical and Computer Engineering (WECE) as well as the Center for Academic Resources in Engineering (CARE) located in Grainger Library. Tutoring can also be arranged. Please contact the course director, Prof. C. Schmitz, cdschmit@illinois.edu.
- **ECE Advising Office:** For any questions that arise or just for someone to talk to, email ece-advisor@illinois.edu. Prof. Schmitz is also an Undergraduate Academic Advisor and can be found at cdschmit@illinois.edu.
- In an emergency, you can leave a message for Prof. Schuh at (217) 300-7091.

Live Sessions

Throughout the semester, we will have "Live Sessions" on Zoom. They will be after the homework has been submitted and will be a review of that weeks homework. Students are encouraged to attend as many sessions as they would like. Attendance is not required; these are just open opportunities for you to use to help review the homework material.

Disability Accommodations

To determine if you qualify for disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contract DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TTY), or email a message to disability@uiuc.edu. If you are concerned you have a disability-related condition that is impacting your academic progress, there are academic screening appointments available that can help diagnosis a previously undiagnosed disability. You may access these by visiting the DRES website and selecting "Request an Academic Screening" at the bottom of the page.

The Office of Minority Student Affairs

For Spring 2025, the Office of Minority Student Affairs' (OMSA) Tutoring and Academic Services will return to delivering services in person with some online availability. The OMSA offers free tutoring and academic services. Matched tutoring, online self-paced workshops and academic skills consultations are among the services featured in the OMSA's Academic Services Center (ASC) located at 1103 W. Oregon, Suite E, Urbana, Il. OMSA's services are designed to help students achieve in college. The level of rigor at the University of Illinois is different than in high school or community college. No matter how you performed before attending Illinois, there is always room to hone your study skills.

- To learn more about their tutoring services and to sign up for a tutor, visithttps://www.omsa.illinois.edu/programs/tutoring/tutoring/.
- To learn more about their academic skills consultations and to request a consultation, visithttps://tutortrac.omsa.illinois.edu/TracWeb40/Default.html.
- To learn more about the self-paced workshops and to take advantage of their self-paced workshops, visit https://www.omsa.illinois.edu/programs/tutoring/workshops/.

You are encouraged to make the most of your tutoring and workshop session(s) by:

- Requesting a tutor at the beginning of the term.
- Come to each of your tutoring or workshop sessions prepared. Preparation includes having your textbooks, notes, and specific questions concerning the material. The more you prepare, the more you will get out of the session.
- Tutors do not serve as a substitute for our instructional faculty. They will not "lecture" or "re-teach." They will provide strategies to help you improve your approach to mastering your course content. Tutoring is not a substitute for missed classes. If you miss class, make sure you get notes from a classmate and meet with your professor during office hours.

Sexual Misconduct Reporting Obligation

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX Office. In turn, an individual with the Title IX Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: wecare.illinois.edu/resources/students/#confidential.

Other information about resources and reporting is available here: wecare.illinois.edu.

Academic Integrity

The University of Illinois at Urbana-Champaign Student Code should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: http://studentcode.illinois.edu/.

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: https://studentcode.illinois.edu/article1/part4/1-401/. Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

Use of Generative AI Technology

Generative AI, such as ChatGPT, Bard, and Microsoft Copilot/Bing Chat, can answer questions and generate text, images, and other media. The appropriate use of generative AI varies from course to course. **In ECE 110, Generative AI CANNOT be used on ANY submitted assignments. To enforce this, homework and individual lab reports MUST be handwritten**. Weekly team reports may be typed.

You may use generative AI in ECE 110 for the following:

- Revising *your own* text for spelling and grammar
- Creating study aids (e.g., flashcards) for quizzes or exams
- Testing and practicing your knowledge of course topics
- Conducting basic research on the course and related topics

NOTE: The use of Generative AI on any submitted assignment is considered an academic integrity violation. If Generative AI is used on a team assignment, the ENTIRE team will receive an academic integrity violation. If your name is on a paper that used Generative AI, we will assume that you approved its use by adding your name to the assignment.

Religious Observances

Illinois law requires the University to reasonably accommodate its students' religious beliefs, observances, and practices in regard to admissions, class attendance, and the scheduling of examinations and work requirements. You should examine this syllabus at the beginning of the semester for potential conflicts between course deadlines and any of your religious observances. If a conflict exists, you should notify your instructor of the conflict and follow the procedure at https://odos.illinois.edu/community-of-care/resources/students/religious-observances/ to request appropriate accommodations. **This should be done in the first two weeks of classes.**

Family Educational Rights and Privacy Act (FERPA)

Any student who has suppressed their directory information pursuant to Family Educational Rights and Privacy Act (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See https://registrar.illinois.edu/academic-records/ferpa/ for more information on FERPA.

Grading Policy

Course grades will be based on ***both*** lecture and lab performance with these weights:

- Three quizzes (10% each x 3 = 30%)
- Final exam (25%)
- Homework (14%)
- Lecture Attendance (1%)
- Laboratory (30%)

The final exam carries added significance as your lowest quiz score will be automatically replaced by your final exam score in the final grade calculation only when the result would improve your grade.

A+	> 97	**B+**	87-90	**C+**	77-80	**D+**	67-70	**F**	< 60
A	93-97	**B**	83-87	**C**	73-77	**D**	63-67		
A-	90-93	**B-**	80-83	**C-**	70-73	**D-**	60-63		

These cutoffs *might* be lowered, but they will not be raised. Furthermore, they are strict. For example, a grade of 89.99 is a B+ and not an A-. Both the lecture **and** the lab must be taken seriously and minimum proficiency of 50% must be shown in the Laboratory grade and a minimum proficiency of 50% must also be shown in the remaining portion of the grade (quizzes, final exam, homework).

Important Lecture/Lab Policy	**A failing grade will be given to any student who does not score at least 50% in both the lab and in quiz + final exam + homework+attendance, separately.**

Occasionally, we hope to produce an ***estimated course letter grade*** for each student, based on the hour exams, homework problems to date, and an assumed high lab grade. **This estimate predicts your final letter grade *optimistically* if you continue the same level of effort throughout the remainder of the semester.** If you receive a low letter grade after the first quiz, you should take action to diagnose the reasons for your performance; instructors are there to help. Students who ignore weak academic performance on exams usually earn poor grades in ECE 110; Students who address deficiencies in academic performance early usually do better in the remainder of ECE 110 and in later semesters.

COURSE SCHEDULE

Visit our website for week-by-week instructions. https://canvas.illinois.edu
A detailed calendar is also given below.

ECE 110 Course Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
January 19	20 MLK No Class	21	22 Lecture 1	23	24	25
26	27 Week 2 Labs Start Lecture 2	28	29 Lecture 3	30	31	February 1
2	3 Week 3 Lecture 4	4	5 Lecture 5	6 HW 1 due HW 2 due GS and PL 11:59 pm	7 Live Session	8
9	10 Week 4 Lecture 6	11	12 Lecture 7	13 HW 3 due GS and PL 11:59 pm Quiz 1 Signup Open	14 Live Session	15
16	17 Week 5 Lecture 8	18	19 Lecture 9	20 HW 4 due GS and PL 11:59 pm Quiz 1 Retry Signup Open	21 Live Session	22
23	24 Week 6 Quiz 1 Lecture 10	25 Quiz 1	26 Quiz 1 Lecture 11	27 HW 5 due GS and PL 11:59 pm	28 Live Session	March 1
2 Section 1 Review due 11:59 pm	3 Week 7 Quiz 1 Retry Lecture 12	4 Quiz 1 Retry	5 Quiz 1 Retry Lecture 13	6 HW 6 due GS and PL 11:59 pm	7 Live Session	8
9	10 Week 8 Lecture 14	11	12 Lecture 15	13 HW 7 due GS and PL 11:59 pm Quiz 2 Signup Open	14 Live Session	15 Spring Break
16 Spring Break	17 Spring Break	18 Spring Break	19 Spring Break	20 Spring Break	21 Spring Break	22 Spring Break
23 Spring Break	24 Week 9 Lecture 16	25	26 Lecture 17	27 HW 8 due GS and PL 11:59 pm Quiz 2 Retry Signup Open	28 Live Session	29

30	31 Week 10 Quiz 2 Lecture 18	April 1 Quiz 2	2 Quiz 2 Lecture 19	3 HW 9 due GS and PL 11:59 pm	4 Live Session	5
6 Section 2 Review due 11:59 pm	7 Week 11 Quiz 2 Retry Lecture 20 Start Final Project	8 Quiz 2 Retry Start Final Project	9 Quiz 2 Retry Lecture 21 Start Final Project	10 HW 10 due GS and PL 11:59 pm Start Final Project	11 Live Session Start Final Project	12
13	14 Week 12 Lecture 22	15	16 Lecture 23	17 HW 11 due GS and PL 11:59 pm Quiz 3 Signup Open	18 Live Session	19
20	21 Week 13 Lecture 24	22	23 Lecture 25	24 HW 12 due 11:59pm Quiz 3 Retry Signup Open	25 Live Session	26
27	28 Week 14 Quiz 3 Lecture 26 Final Project Q&A	29 Quiz 3 Final Project Q&A	30 Quiz 3 Lecture 27 Final Project Q&A	May 1 HW 13 due GS and PL 11:59 pm Final Project Q&A	2 Live Session Final Project Q&A	3
4 Section 3 Review due 11:59 pm	5 Week 15 Quiz 3 Retry Review 1	6 Quiz 3 Retry	7 Quiz 3 Retry Review 2 **HW 14 due GS and PL 11:59 pm** Final Report due 11:59 pm	8 Reading Day NO CLASS	9 Finals Begin	10
11	12 Finals Week	13 Finals Week	14 Finals Week	15 Finals Week	16 Finals Week	17

Thanks!

We welcome ***your*** suggestions to make ***your*** course better.

On the following pages you will find information about protecting yourself from life-threatening situations (Run-Hide-Fight) and from threats against your well-being (a disengaged teammate).

Run > Hide > Fight

Emergencies can happen anywhere and at any time. It is important that we take a minute to prepare for a situation in which our safety or even our lives could depend on our ability to react quickly. When we're faced with almost any kind of emergency – like severe weather or if someone is trying to hurt you – we have three options: Run, hide or fight.

Run

Leaving the area quickly is the best option if it is safe to do so.

- Take time now to learn the different ways to leave your building.
- Leave personal items behind.
- Assist those who need help, but consider whether doing so puts yourself at risk.
- Alert authorities of the emergency when it is safe to do so.

Hide

When you can't or don't want to run, take shelter indoors.

- Take time now to learn different ways to seek shelter in your building.
- If severe weather is imminent, go to the nearest indoor storm refuge area.
- If someone is trying to hurt you and you can't evacuate, get to a place where you can't be seen, lock or barricade your area if possible, silence your phone, don't make any noise and don't come out until you receive an Illini-Alert indicating it is safe to do so.

Fight

As a last resort, you may need to fight to increase your chances of survival.

- Think about what kind of common items are in your area which you can use to defend yourself.
- Team up with others to fight if the situation allows.
- Mentally prepare yourself – you may be in a fight for your life.

Please be aware of people with disabilities who may need additional assistance in emergency situations.

Other resources

- **police.illinois.edu/safe** for more information on how to prepare for emergencies, including how to run, hide or fight and building floor plans that can show you safe areas.
- **emergency.illinois.edu** to sign up for Illini-Alert text messages.
- **Follow the University of Illinois Police Department** on Twitter and Facebook to get regular updates about campus safety.

Professional Development

Professional development of students is important to this course. The following storyline will be discussed in class.

SANTA CLARA UNIVERSITY

MARKKULA CENTER FOR APPLIED ETHICS

Picking Up the Slack

Chloe Wilson

****DISCLAIMER: All characters and scenarios in this post are fictional.****

Greg and Natalie have been in business classes together since freshman year. While they're not close friends, they have always enjoyed each other's company in class and have been in the same social circle as they've moved from lower division courses to where they are now: senior capstone. Greg and a few of his friends invite Natalie to join their group at the start of the term, and they begin to work on their project.

Fairly quickly, though, Greg realizes that Natalie isn't pulling her weight. Any aspect of the project that's assigned to her has to be redone by other members of the group, she doesn't pay attention in meetings, and she consistently shows up late or hung over. Greg and his other groupmates think that Natalie needs to step it up and take this project seriously, but they ultimately agree it would be more trouble than it's worth to confront her about it. They decide to just push through and let her do her own thing. Natalie continues to participate marginally in discussions, planning, and writing, but makes it clear through her actions that their final presentation is not her biggest priority.

After Greg's group gives its final presentation, the members are asked to write an evaluation on their teammates that the professor will use to determine individual grades. When it comes to most of his teammates, Greg easily gives them all A's and B's for their participation and contributions to the project. However, when Greg comes to Natalie's evaluation, he is faced with a dilemma. It's their last big project before graduation, and if he were to evaluate her in a harsh way, it could negatively affect her cumulative GPA. He doesn't want to throw her under the bus; however, her apathy and poor work ethic put a huge burden on everyone else's shoulders, and Greg had to personally sacrifice a lot of time and effort to make up for her mistakes or tasks that she left undone.

Is it worth giving her an honest evaluation, just so the professor will give her the grade she deserves? Or is giving her a bad evaluation petty and unnecessary, considering that they are all about to graduate and their group received an A, regardless of her performance?