### CECS 311 - Syllabus

### Principles of Computer Engineering II

### Spring 2025

### Instructor: Eric Hernandez

Office Hours: M/W 11:00 A.M.-12:00 P.M. in-person in ECS-524 or by appointment

E-mail Address: eric.hernandez@csulb.edu

Course Materials: <http://www.csulb.edu/~eric.hernandez@csulb.edu>

Lecture: Sec: 1, Class #: 2711, Mon., Wed., 8:00 A.M. to 8:50 A.M. ECS-411

Laboratory: Sec: 2, Class #: 2712, Mon., Wed., 9:00 A.M. to 10:15 A.M. ECS-411

Communication: Canvas and my Campus Email

**Assignment Submissions & Grading:** Canvas

### A. Description

This is a continuation of 211 into the amazing world of electronics. At the core of all computing and modern devices is the use of electricity to perform meaningful and useful work. This class will focus on the practical applications of electronics and circuits to computing systems.

### B. Organization

This is a lecture and lab based course in which topics are presented in the lecture and demonstrated in the lab through a series of projects that build upon each other. It is very important that each lab is completed as most labs will rely on the knowledge gained from the previous one. Successful completion of the course is reliant upon completion of the labs.

### C. Course Objectives

1. To Build upon the fundamentals of 211 and design more useful circuits.
2. To continue learning the operation of electrical devices, components.
3. To learn the applications of these components and how they work together in a circuit.
4. To build an understanding of how to analyze these circuits.
5. To apply knowledge of mathematics, science and engineering to electrical and electronic systems
6. To conduct experiments and interpret data.
7. To identify, formulate and solve engineering problems.
8. To be able to form and test hypotheses. This is vital for debugging and troubleshooting.
9. To effectively communicate results using the nomenclature and jargon of the industry.

### D. Course Topics

|  |  |  |
| --- | --- | --- |
| Fundamentals of Electricity | Semiconductor Materials | Diodes |
| Linear Power Supplies | Bipolar Junction Transistors | BJT Amplifiers |
| Field Effect Transistors | H-Bridges | Operational Amplifiers |
| Comparators | Passive Filters | Active Filters |
| Switching Power Supplies | Digital/Analog Interfacing | Measuring Instruments |
| Oscilloscopes | Soldering |  |

### E. Text and Required Materials

**Grob’s Basic Electronics**: (2024 Release) by Mitchel E. Schultz

ISBN: 9781265468002 or 978-1-266-72249-3

Modeling Software:

**LTSpice** – Free full version from Linear Technologies, Use the version available on my website.

Supplies:

Lab Test Equipment, Multimeter, Breadboard, wire and other discrete components (Resistors, Capacitors and Inductors as required). This will be covered during the first day and recommendations are available on my website.

### F. Copyright Notice

All materials for this class: syllabus, website, lecture/lab/tutorial videos, lab documents and all other documents pertaining to this class are Copyright © 2021 Eric Hernandez. These materials are protected by U.S. and International copyright laws. Reproduction and distribution of these materials without written permission of the creator is prohibited.

### G. Grading Plan

Coursework will be weighted as follows:

1. Midterm 1 25%
2. Final Exam 30%
3. Final Project 15%
4. Labs and Homework 30% Late work will lose 10% per **day**.

A – 100%-90%

B – 89%-80%

C – 79%-70%

D – 69%-60%

F – 59%-0%

Grades will be curved once at the end of the semester. “Curving” will never cause you to receive a grade lower than the scale above.

### G1. Midterm

There will be one midterm exam around week 7 to 8, the specific date of which to be determined during class and announced at least 1 week before. It will consist of all material up to that point of class. Preparatory materials including sample exams are already available on the website. For makeups, please refer to the makeup policy.

### G2. Final Exam

There will be one final exam during our scheduled final exam date and time, this is posted later in the semester by the school and is viewable on my.csulb.edu. The Final Exam is cumulative and will consist of approximately 2/3rd new material and 1/3rd pre-midterm material. Preparatory materials including sample exams are already available on the website.

**G3. Final Project**

The final project will require all knowledge gained from previous labs to complete. It will consist of a demonstrable physical prototype and a well written report that demonstrates a clear understanding of theory along with calculations and simulations. Details of this final project including requirements and grading rubric are on the class website.

### G4. Labs and Homework

Topics presented during the lecture are demonstrated in the lab through a series of projects that build upon each other. It is crucial that each lab is completed as the lab progression will rely on the knowledge gained from the previous one. Successful completion of the course is reliant upon completion of the labs.

### G5. Attendance

Attendance to lectures and labs is necessary for learning and vital to the successful completion of the labs. Periodically throughout the semester while we are working on a lab I will take attendance for my own records. These attendance records are not part of the calculated grade but are used by me for determining how I can better help a particular student if they are struggling to complete an assignment or having difficulty with the material presented in class.

### H. Exam/Assignment Makeup Policy

Make-up exams are provided for any excused absence. Excused absences include, but are not limited to:

- Illness, injury to the student, or medical conditions, including those related to pregnancy

- Death, injury, or serious illness of an immediate family member. An immediate family member is defined as a close relative, or a person residing in the immediate household of the student.

- Religious reasons (California Education Code section 89320)

- Jury duty, military service, or other government obligation

- University-sanctioned or -approved activities (examples include but are not limited to artistic performances, participation in scholarly conferences and presentations, intercollegiate athletic activities, student government, required class field trips, etc.)

Anticipated Absences require advanced notification (minimally one week in advance) as well as verification. These absences may include the following reasons:

- Religious reasons,

- Jury duty, military service, or other government obligation

- University-sanctioned or -approved activities

Non-anticipated absences are usually a type of emergency and cannot be anticipated. These absences may include the following reasons:

- Illness, injury to the student, or medical conditions, including those related to pregnancy

- Death, injury, or serious illness of an immediate family member. An immediate family member is defined as a close relative, or a person residing in the immediate household of the student.

A make-up exam will be given for any excused absence with documentation. For example in the case of a medical emergency, documentation may take the form of a doctor’s note or if the emergency was an vehicular accident then an accident report would serve as documentation.

*To learn more about the University policy on Attendance, visit:*

<https://www.csulb.edu/academic-senate/policy-statement-17-17-attendance-policy-supersedes-01-01>

### I. Cheating/Plagiarism/Academic Integrity Policy

There is **zero tolerance** for cheating, plagiarism, or any other act of violation of Academic Integrity policy. Work that you submit is assumed to be original unless your source material is documented appropriately, using proper citation. Using the ideas or words of another person, even a peer, or a web site, as if it were your own, is plagiarism. Any individual or group caught cheating on homework, lab assignments, or any exam/quiz will be subjected to full extent of academic actions allowed under University regulations.

***At a minimum,*** any student caught *violating the Academic Integrity Policy* will receive no credit for the work concerned, and will receive a reduction of one letter grade from their final course grade.

*To learn more about the University policy on Cheating and Plagiarism, visit:*

http://catalog.csulb.edu/content.php?catoid=5&navoid=369#cheating-and-plagiarism

### J. Tentative Schedule (Dates may vary due to holidays and project requirements)

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| --- | --- |
| Week 1 | Review of Fundamentals - Ohms Law, Power, KVL, KCL, Series, Parallel |
| Week 2 | Semiconductors/P-N Junctions, Ch 27 - Diodes and Diode Applications |
| Week 3 | Ch 27 - Diodes and Diode Applications, Rectifiers |
| Week 4 | Linear Power Supplies |
| Week 5 | Chapter 28 - BJTs - Bipolar Junction Transistors, Switching Circuits |
| Week 6 | Chapter 29 – BJT Amplifiers, Midterm 1 Review |
| Week 7 | Midterm 1, BJT Amplifiers Continued |
| Week 8 | Chapter 30 - FETs - Field-Effect Transistors and FET Circuits |
| Week 9 | Chapter 33 - Operational Amplifiers, Comparators |
| Week 10 |  |
| Week 11 | Filters – Passive |
| Week 12 | Switching Power Supplies |
| Week 13 | Filters – Active |
| Week 14 | Digital/Analog Converters, Weighted Summer, Midterm 2 Review |
| Week 15 | Midterm 2 |
| Finals Week | CECS 311 - Final Exam (refer to CSULB schedule for day and time) |

### K. Class Prerequisites

CECS 211, CECS 201 all with a grade of "C" or better.

### L. COE Tutoring Services Available for Major Classes

The College of Engineering Tutoring Center offers free tutoring for many lower and upper division engineering courses in MAE, CECS, CECEM, CHE and EE. Tutors are available Monday through Friday during the fall and spring semesters between the hours of 9:00am-6:00pm in EN2-300.

Visit the following website for detailed tutoring schedules:

[http://web.csulb.edu/colleges/coe/views/essc/academic\_success/engineering\_tutor.shtml#asp\_ETP](http://web.csulb.edu/colleges/coe/views/essc/academic_success/engineering_tutor.shtml)

### M. Accommodations:

Students with disabilities who require reasonable academic accommodations are strongly encouraged to register with the Bob Murphy Access Center (BMAC) each semester. Students must submit supporting disability documentation to BMAC and provide faculty of any BMAC verification of accommodations as early in the semester as possible. BMAC is located in the Shakarian Student Success Center, Room 110 and can also be reached by phone at (562) 985-5401 or via email at bmac@csulb.edu.

### N. Sexual Assault, Rape, Dating/Domestic Violence, & Stalking

Title IX prohibits gender discrimination, including sexual harassment and sexual misconduct. If you have experienced sexual harassment, sexual assault, rape, dating/domestic violence, or stalking, the campus confidential Victim’s Advocate is available to help. Jaqueline Urtez (e: advocate@csulb.edu, p: (562) 985-2668) can provide free and confidential support, accommodations, and referrals for victims without having to report the assault to campus authorities. While students are welcome to discuss assaults with faculty, both faculty and teaching assistants are mandatory reporters who are required to report all incidents of sexual harassment/misconduct to the Title IX office for follow-up and possible investigation. Students who do wish to report the assault for possible investigation may contact the confidential victim’s advocate, who can help them through the reporting process, or they can report the assault directly to the Title IX Office by completing an online reporting form at https://www.csulb.edu/equity-diversity/title-ix or contacting the Office of Equity & Diversity at OED@csulb.edu.

### O. Food and Housing Assistance

Any student who is facing academic or personal challenges due to difficulty in affording groceries/food and/or lacking a safe and stable living environment is urged to contact the CSULB Student Emergency Intervention & Wellness Program. The website outlining the resources available is www.csulb.edu/basicneeds. Students can also e-mail supportingstudents@csulb.edu or call 562/985.2038. If comfortable, students may reach out to the professor as they may be able to identify additional resources.