



ZJU-UIUC INSTITUTE

Zhejiang University-University of Illinois Urbana-Champaign Institute

浙江大学伊利诺伊大学厄巴纳香槟校区联合学院

ECE 110: Introduction to Electronics

Course Syllabus (Spring 2024)

Course Overview

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.

Required Course Materials

- **Lecture Notes:** weekly uploaded to Blackboard ECE 110
- **Laboratory Manuals:** available online at Blackboard ECE 110
- **Laboratory equipment.** ECE110 Electronics kit, SparkFun Electronics, RedBoard, and car chassis.

Lecture Schedule

| Days | Time | Location | Instructor | Email |
|------|-------------|----------|--|--|
| Mon | 9:00-9:50 | LTN-A418 | Yu Lin, Gehan Amaratunga, Umberto Ravaioli | yulin@intl.zju.edu.cn |
| Wed | 10:00-10:50 | | | gehan@intl.zju.edu.cn ravaioli@illinois.edu |

Laboratory Schedule

| Section | Days | Time | Location | Instructor | Email |
|---------|------|-------------|----------|--------------|-----------------------------|
| A1 | Tue | 13:00-15:50 | LB E-214 | Zhejun Tang | zhejuntang@intl.zju.edu.cn |
| A2 | Tue | 13:00-15:50 | LB E-201 | Shilei Zhang | shileizhang@intl.zju.edu.cn |
| A3 | Tue | 13:00-15:50 | LB E-209 | Si Li | sili@intl.zju.edu.cn |
| A4 | Fri | 9:00-11:50 | LB E-209 | Shilei Zhang | shileizhang@intl.zju.edu.cn |

Notes: Always read the laboratory assignment before your laboratory session. All of the lab sessions include a *pre-lab* that you must complete *before* you go to your lab

Office Hours Schedule

| Instructor | Time | Location | Email |
|--|-----------------------------|-----------|-----------------------|
| Yu Lin | Week 1-7, Mon, 11:00-12:00 | ZJUI C423 | yulin@intl.zju.edu.cn |
| Gehan Amaratunga | Week 8-14, Mon, 11:00-12:00 | ZJUI B404 | gehan@intl.zju.edu.cn |
| Notes: Questions or concerns? You may go to any office hours that fit in your schedule. | | | |

Examinations

Estimated dates (specific time TBD); location for all exams *Computer-Based Testing Facility (CBTF)*

| Midterm 1 | Midterm 2 | Midterm 3 | Final Exam |
|--|---|--|---|
| Mar. 7 th – Mar. 14 th | Apr. 11 th – Apr. 18 th | May 6 th – May 10 th | May 22 nd – Jun. 2 nd |

WARNING: The final weeks of the semester are going to be very busy with final project demo and report, and the Final Exam. Budget your time carefully and make advanced preparations to be on schedule.

Examination Policy

Midterm Exams are 50-minute sessions taken at the Computer-Based Testing Facility. If you have an unavoidable medical or personal emergency, you must notify the Instructor immediately, and you must document your absence as best you can. The final exam will last 3 hours and contain approximately 30 PrairieLearn style short answer and/or multiple-choice problems.

Homework

Homework problems are on-line and administered through PrairieLearn at the following URL (login with your intl.zju.edu.cn, find ECE 110 Spring 2024 ZJUI):

<https://prairielearn.engr.illinois.edu> When you submit answers, they are graded immediately. There is no partial credit for homework completed after the deadline.

DEADLINE: Homework will be due **Sundays at Midnight (11:59 pm)** unless stated otherwise. Students will **not** be reminded about due dates. A request for excuse (sickness) must include appropriate documentation, but is rarely granted. 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.

Laboratory Attendance Policy

Laboratory attendance is **mandatory each and every week**. If you have an

unavoidable medical or personal emergency, contact your lab instructor (*not* your lecture instructor) as soon as possible to arrange a make-up lab.

Lecture Attendance Policy

NOTE: A portion of your course grade will depend on the Instructor's assessment of your participation in lecture over the course of the semester.

I invite relevant questions and comments during lectures. Address your questions and comments to the entire class; avoid disruptive behavior such as repeatedly talking to neighbors, unless the Instructor invites you to form discussion groups. Kindly turn off cell phones and noisy devices during lectures and use laptops only for tasks related to ECE 110 (note taking, viewing homework, etc). Texting or web browsing is not allowed in class.

Discussion questions will be asked in each and every lecture. The goal is to gauge understanding of the material and encourage discourse in English. Engineering is not a solitary endeavor and your contribution to discussions during lectures is expected.

Grading Policy

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

- **Lecture material (70%):** Hour exams (10% each $\times 3 = 30\%$), Final exam (25%), Homework (10%), Lecture participation (5%). The final exam carries added significance as your lowest hour exam score will be replaced by your final exam score if the result would improve your grade.
- **Laboratory (30%):** Includes such factors as experiments, the design challenge, and effort.

| | | | | |
|----------|----------|----------|----------|--------|
| 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 both.

Important Lecture / Lab Policy: A failing grade will be given to any student who does not score at least 50% in both the lecture and the lab separately.

Other Policies: Plagiarism will not be tolerated in any form. Submit your own work and document the sources of any materials used in producing your reports (including figures, programming code, schematics, data, and even text from your own previous projects) so that grading can be done according to your contribution without ambiguity. Students are encouraged to discuss the course material, homework problems, and laboratory exercises but, ultimately, all work you submit **must be your own**.

***Tentative* COURSE SCHEDULE**

| Week # | Lecture # | Lecture Content | Homework | Lab |
|--------------|--------------------------|--------------------------------------|--------------|--------------------|
| 1 | 1 Jan. 15 th | Definitions | HW#1 due | Lab#1 |
| | 2 Jan. 17 th | IV measurements | Sun 11:59 PM | |
| 2 | 3 Jan. 22 nd | Circuit Schematics | HW#2 due | Lab#2 |
| | 4 Jan. 24 th | Power and Energy | Sun 11:59 PM | |
| Spring Break | | | | |
| 3 | 5 Feb. 26 th | Lab Devices | HW#3 due | Lab#3 |
| | 6 Feb. 28 th | Kirchhoff's Laws | Sun 11:59 PM | |
| 4 | 7 Mar. 4 th | Circuit Tools | HW#4 due | Lab#4 |
| | 8 Mar. 6 th | Application of Circuit | Sun 11:59 PM | |
| 5 | 9 Mar. 11 th | Time-Average Power | HW#5 due | Lab#5 |
| | 10 Mar. 13 rd | Signed Power | Sun 11:59 PM | |
| 6 | 11 Mar. 18 th | IV Characteristics | HW#6 due | Lab#6 |
| | 12 Mar. 20 th | Thevenin Equivalents | Sun 11:59 PM | |
| 7 | 13 Mar. 25 th | Norton; Superposition | HW#7 due | Lab#7 |
| | 14 Mar. 27 th | Node Method | Sun 11:59 PM | |
| 8 | 15 Apr. 1 st | Characterizing Sensors | HW#8 due | Lab#8 |
| | 16 Apr. 3 rd | Intro to Diodes | Sun 11:59 PM | |
| 9 | 17 Apr. 8 th | Diode Circuits | HW#9 due | Lab#9 |
| | 18 Apr. 10 th | Diode Applications | Sun 11:59 PM | |
| 10 | 19 Apr. 15 th | Transistor: BJT | HW#10 due | Lab#10 |
| | 20 Apr. 17 th | BJT IV | Sun 11:59 PM | |
| 11 | 21 Apr. 22 nd | BJT Voltage Amplifier | HW#11 due | Lab#11 |
| | 22 Apr. 24 th | More on Transistors | Sun 11:59 PM | |
| 12 | 23 Apr. 29 th | Field Effect Transistors | HW#12 due | Lab#12 |
| | May 1 st | Holiday (no class) | Sun 11:59 PM | |
| 13 | 24 May 6 th | CMOS Logic | HW#13 due | Lab#13 |
| | 25 May 8 th | Analog-to-Digital | Sun 11:59 PM | |
| 14 | 26 May 13 rd | Preserving Info. in A/D | HW#14 due | Final Project Demo |
| | 27 May 15 th | Solar Energy | Sun 11:59 PM | |
| 15 | 28 May 20 th | Personalized Content / Course Review | | |

Schedule of lab session during Labor day holiday depends on Campus arrangement.