

University of California, Santa Cruz – Summer 2022
Jack Baskin School of Engineering
Department of Electrical and Computer Engineering

ECE 101 – Introduction to Electronic Circuits

Course Units: 5.00

Professor: Dr. Austin Chen
Office: E2-237B
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Class Schedule: Mon/Wed 4:45 pm – 8:15 pm, BE-152
Office Hours: Email or after class

I - COURSE DESCRIPTION

Introduction to the theory and analysis of electrical circuits; basic circuit elements including the operational amplifier, circuit theorems (KVL, KCL), dc circuits, forced and natural responses of simple circuits, and sinusoidal steady state analysis. A variety of linear circuit analysis techniques will be emphasized and treated. Consideration is given to power, energy, impedance, phasors, frequency response and their use in circuit design.

II - TEXTBOOK (Required)

Circuit Analysis and Design by Ulaby, Maharbiz, and Furse
Ebook: <http://cad.eecs.umich.edu> (free for download)

Additional Reference:

PSpice for Basic Microelectronics (1st edition 2008) by Joseph Tront

III - SOFTWARE

Matlab
PSpice (for virtual lab only)

VI - Prerequisite by Topic

Students should have already taken PHYS 5C and PHYS 5N; or PHYS 6C and PHYS 6N; and MATH 24 or previous or concurrent enrollment in AM 20. Concurrent enrollment in ECE 101L is required. Should you have any questions or concerns pertaining to your background, please contact your instructor.

V - GRADING POLICY

Homework (selectively collected)	10%
Midterm	35%
Final	45%
Attendance, class etiquette, and pop quiz	10%

Letter Grade (Tentative)

$X \geq 85$	A
$80 \leq X < 85$	A-
$75 \leq X < 80$	B+
$70 \leq X < 75$	B
$65 \leq X < 70$	B-
$60 \leq X < 65$	C+
$55 \leq X < 60$	C
$50 \leq X < 55$	C-
$45 \leq X < 50$	D
$X < 45$	F

VI - CLASS POLICIES AND PROCEDURES

Attendance:

The class will be taught synchronously and there will be no recording of the lecture. Students are expected to attend every lecture. Students are responsible for arriving before the class begins, and remaining for the duration of the course meeting. If a student misses a class, it is his/her responsibility to find out what was discussed in class, any homework assigned or exam scheduled.

Homework (Selectively Collected) and Make-up Exam:

No late homework is accepted. **Absolutely** no make-up exam will be given.

Homework:

Homework will be assigned on a regular basis (~9 HWs), approximately two sets per week. Homework must be turned in on 8.5"X11" paper written on one side with the necessary information such as Name, ID#, Course #, Homework # and date on top right hand corner of the first page.

Examination Dates:

Midterm Exam: 7/11/2022 (class time)

Final Exam: 7/25/2022 (class time)

The exam is closed book and closed notes.

Academic Integrity:

Ideas and learning form the core of the academic community. In all centers of education, learning is valued and honored. No learning institution can thrive if its members counterfeit their achievement and seek to establish an unfair advantage over their fellow students. The Academic Integrity is designed to foster a fair and impartial set of standards. All students are required to adhere to these standards. Any dishonest act such as copying, plagiarism, lying, unauthorized collaboration, alteration of records, bribery, and misrepresentation for the purpose of enhancing one's academic standing results in a failing grade for the entire course and will be reported to the College as well as the Dean of Students.

VII - COURSE AGENDA

Week	Date	Topic	Lab
1	22-June	Course Introduction, circuit elements, Kirchoff's laws, Ohm's law, series/parallel circuits, voltage and current division, nodal and mesh analysis	
2	27-June	Superposition, source transformation, Thevenin and Norton equivalent circuits, maximum power transfer theorem	Lab 1 (6/24): Orientation and fundamental circuit theory
2	29-June	Review of reactive elements (inductor and capacitor), operational amplifiers	
3	4-July	Independence Day (no class)	Lab 2: (7/1) Thevenin/Norton equivalent circuits and maximum power transfer
3	6-July	First-order RC and RL circuits, midterm review	
4	11-July	Midterm Exam	Lab 3 (7/8): Operational amplifiers
4	13-July	Second-order RLC circuits	
5	18-July	Impedance and admittance, sinusoidal steady-state analysis (AC/phasor)	Lab 4 (7/15): Second-order RLC circuits and AC/phasor
5	20-July	Introduction to frequency response (Bode plot) and filter, final review	
6	25-July	Final Exam	

Considering the course schedule and material, weekly recitation sessions will be conducted by your TAs to cover certain supplementary topics and reinforce the key concepts.

The Content of the Course Syllabus is Subject to Change with Appropriate Notice to the Students