

California State University Northridge  
Department of Electrical and Computer Engineering  
Course: **Electronics II (ECE 440)**

Section: 01  
Spring, 2018

Instructor: Jack Ou, Ph.D.  
Office Location: JD 3337  
Telephone: (818) 677-7592  
Email: jack.ou@csun.edu  
Regular Office Hours: F: 4-5 p.m.  
*By appointment* Office Hours: T, TH 10:00-10:30 and W 4:30-5:00 p.m.  
Class Time: F 1:00 p.m. - 3:45 p.m.  
Classroom: JD 1102

**Course Description**

This course provides a foundation for students to understand and design negative feedback circuits, positive feedback circuits such as oscillators, and active filters.

**Prerequisite:** ECE 340

**Co-requisite:** ECE 440L ECE440L is a required co-requisite for ECE 440. You will be removed from the roster if you are not enrolled in the lab.

*Prerequisite by topics:* basic circuit analysis techniques (e.g. KVL/KCL, equivalent resistance calculation, nodal/mesh analysis, Thevenin/Norton equivalent circuit, capacitor/inductor, steady-state analysis, and **frequency response**). In addition, you are also responsible for concepts covered in ECE 340 (e.g. small-signal analysis, basic amplifier circuits (i.e. CE/CS, CB/CG, and CC/CD) design, frequency response, differential amplifier circuits, and current mirror.)

**Textbook:**

1. (Required) Sedra/Smith, "Microelectronic Circuits", Oxford University, 7th edition. (ISBN-13: 978-0-19-933913-6) Sixth edition available from Canvas.
2. (Required, available from Canvas) Behzad Razavi, "Fundamentals of Microelectronics", Wiley, second edition.
3. ECE 440 Course reader (required): available for purchase from SunStar Copy at 9514 Reseda Blvd., Northridge, CA 91324. Call Rene Dalumpines at (818) 718-6151 for store hours and price.

## Course Objectives

We want to help students cultivate reasoning skills they need to solve unfamiliar engineering problems. We will use a combination of lectures, in-class discussions, assignments and exams to achieve this goal. Upon completing this course, students should be able to analyze and design a combination of feedback circuits and amplifier circuits.

## Assessment

1. **Exams** (70%): midterm (35 %) and final (35%).
2. **Homework assignments** (20 %) There will be homework assignments throughout the semester. Homework submissions must be stapled and have a cover sheet, otherwise they will not be accepted. Due to the sheer volume of assignments that must exchange hands, I will not be able to *allow submission of late homework assignments*. Assignments are collected in the beginning of the class, placed in an envelope, and handed over to the grader. Only *one* homework assignment will be excluded from the computation of homework assignment grades.
3. **Class participation** (5%)
4. **Course portfolio** (5%) Homework assignments are returned to students prior to exams and will be collected after each exam in order to compile statistics for ABET accreditation.

**Grading scale:** The course grade is computed from the cumulative *course total* percentage after the final exam is graded as follows: 100 – 94 = A, 93 – 90 = A-, 89 – 87 = B+, 86 – 83 = B, 82 – 80 = B-, 79 – 77 = C+, 76 – 73 = C, 72 – 70 = C-, 69 – 67 = D+, 66 – 63 = D, 62 – 60 = D-, 59 or < = F.

**Cheating Policy** Each students grade will be based upon his/her own work. **Any student found cheating on any graded material, will not be considered to have met the basic requirements of this course and thus will receive the grade of F.** Cheating will also result in the appropriate disciplinary action being taken.

**Special accommodation** If you have a disability and need accommodations, please register with the Disability Resources and Educational Services (DRES) office or the National Center on Deafness (NCOD). The DRES office is located in Bayramian Hall, room 110 and can be reached at (818) 677-2684. NCOD is located on Bertrand Street in Jeanne Chisholm Hall and can be reached at (818) 677-2054. If you would like to discuss your need for accommodations with me, please contact me to set up an appointment.

## Notes

1. *Scanned lecture notes:* **Students are expected to take their own notes.** Scanned lecture notes are available approximately **one** week before each exam.
2. *Email communication:* I do not answer emails on weekends and outside of regular work hours. Due to sheer number of emails, it normally takes up to 24 hours for an email to be replied.

**Course schedule** (*subject to change-check course website regularly for updates*)

#	Date	Topic	Section	Lab
1	1/26	Syllabus, DC and small signal analysis	[1] 7,8	Multistage Amplifiers
2	2/2	Small signal analysis, differential circuits	[1] 9	
3	2/9	Intro to negative feedback, the feedforward system	[2] 12.1-12.3	Differential Amplifiers
4	2/16	Subtractor circuit, feedback network	[2] 12.4	
5	2/23	Feedback polarity, open-loop parameters, feedback factor	[2] 12.5-12.7	Feedback amplifier
6	3/2	Open loop parameters, loaded feedback factor, closed-loop parameters	[2] 12.6-12.7	
7	3/9	Fundamentals of oscillators, ring oscillator	[2] 12.8, 13.1-13.2	Oscillator
8	3/16	<b>Midterm</b> , Op-amp based oscillator	[2] 13.4-13.5	
9	3/23	<b>Spring break</b>		
10	3/30	<b>Cesar Chavez</b> (No class)		
11	4/6	BJT oscillator circuits, review of filters	[2] 13.3, 13.6, 15.1-15.3	Oscillator
12	4/13	Second order opamp filters, Butterworth	[2] 15.5.1	Active filter
13	4/20	Chebyshev	[2] 12	
14	4/27	Class A and class B amplifier	[1] 12.1-12.3	
15	5/4	Class AB amplifier	[1] 12.4-12.5 and 12.7	
16	5/11	TBD		
	5/18	Final exam, <b>12:45-2:45</b>		