University of Portland
Donald P. Shiley School of Engineering

EE352
Electronic Circuits II
(3 credit hours)

Course Syllabus
Spring, 2020

Lecture Hours: MWF, 1:35-2:30pm, Shiley Hall 101

Course Description: EE352 is a continuation of EE351. It includes advanced analog circuit theory, analysis, and simulation using PSPICE. Topics include 1) BJT and MOS transistor amplifiers, 2) frequency response, 3) feedback, and 4) opamp active filters. EE352 provides the theoretical foundation for the companion electronics laboratory course, EE371. (Prerequisite: EE351. Corequisite: EE371.)

Student Outcomes:

1) Learn design and analysis of advanced analog electronic circuits including BJT, MOSFET and opamp amplifier circuits. Learn Laplace s-plane analysis for full Frequency Response of circuits.
2) Learn electronic feedback theory and techniques.
3) Learn proper electronic laboratory build and measurement techniques through three required lab assignments in conjunction with the companion/corequisite EE371 lab course.
4) Learn the detailed design, analysis and laboratory build and test of a specific discrete Common Emitter Amplifer in conjunction with the companion/corequisite EE371 lab course.
5) Learn CAD simulation of electronic circuits using PSPICE and MATLAB.
6) Learn basic device physics of Si pn junciont diode and BJT.
7) Learn introductory nanoelectronics.

Instructor: Dr. Peter M. Osterberg, oster@up.edu, https://faculty.up.edu/oster,
Shiley Hall 225, 503-943-7416, Office hours posted on office door.

Text: Microelectronic Circuits, 7th edition, A. Sedra and K. Smith, Oxford University Press, 2015

Assessment Tools:
15% Homework
50% Exams (2)
35% Final Exam

Grading Scale:
90% - 100% = A^- – A
80% - 89% = B^- – B^+
70% - 79% = C^- – C^+
60% - 69% = D^- – D^+
Below 60% = F

Course Outline

Date	Topic	Text
1/13	Introduction and review	
1/15	BJT Diff Amp with Passive Load	Ch. 8
1/17	BJT Diff Amp with Passive Load	Ch. 8
1/20	*Holiday (no class)*	
1/22	PSPICE day	
1/24	BJT Diff Amps with Active Load	Ch. 8
1/27	MOS Diff Amps with Active Load	Ch. 8
1/29	MOS Diff Amps with Active Load	Ch. 8
1/31	s-Domain and Frequency Response	Ch. 6 and 9
2/3	Frequency Response of CE Amp	Ch. 6 and 9
2/5	Frequency Response of CE Amp	Ch. 6 and 9
2/7	Frequency Response of CS Amp	Ch. 5 and 9
2/10	Frequency Response of CS Amp	Ch. 5 and 9
2/12	Frequency Response of Multistage Amps	Ch. 6 and 9
2/14	Frequency Response of Multistage Amps	Ch. 6 and 9
2/17	Exam review	
2/19	**Exam 1**	
2/21	*SWE Job Fair*	Ch. 10
2/24	Des Proj (Lab #2) discussion; Negative Feedback	Ch. 10
2/26	Negative Feedback	Ch. 10
2/28	Negative Feedback	Ch. 10
3/2	*Spring Break (no class)*	
3/4	*Spring Break (no class)*	
3/6	*Spring Break (no class)*	
3/9	Negative Feedback	Ch. 10
3/11	Feedback Application: Servo Motor Control	
3/13	Feedback Application: Servo Motor Control	
3/16	Feedback Stability and Loop Gain	Ch. 10
3/18	Feedback Examples	Ch. 10
3/20	Feedback Examples	Ch. 10
3/23	BJT Opamps	
3/25	BJT Opamps	
3/27	BJT Opamps	
3/30	Exam review	
4/1	**Exam 2**	
4/3	Transformer, Charge Pump	
4/6	Intro to Analog Active Fitlers	Ch. 16
4/8	First and Second Order Systems	Ch. 16
4/10	*Holiday (no class)*	
4/13	*Holiday (no class)*	
4/15	BJT device physics	Ch 6
4/17	Si pn junction diode device physics	Ch 3
4/20	Si pn junction diode device physics	Ch 3
4/22	Special topic: Intro to Nanoelectronics; Final Exam review	
4/24	Final Exam review	
4/28	**Final Exam** (8am-10am)	

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Academic integrity is openness and honesty in all scholarly endeavors. The University of Portland is a scholarly community dedicated to the discovery, investigation, and dissemination of truth, and to the development of the whole person. Membership in this community is a privilege, requiring each person to practice academic integrity at its highest level, while expecting and promoting the same in others. Breaches of academic integrity will not be tolerated and will be addressed by the community with all due gravity.

University of Portland's Assessment Disclosure Statement:
Student work products for this course may be used by the University for educational quality assurance purposes.

University of Portland's Accessibilty Statement:
The University of Portland endeavors to make its courses and services fully accessible to all students. Students are encouraged to discuss with their instructors what might be most helpful in enabling them to meet the learning goals of the course. Students who experience a disability are also encouraged to use the services of the Office for Accessible Education Services (AES), located in the Shepard Academic Resource Center (503-943-8985). If you have an AES Accommodation Plan, you should make an appointment to meet with your faculty member to discuss how to implement your plan in this class. Requests for alternate location for exams and/or extended exam time should, where possible, be made two weeks in advance of an exam, and must be made at least one week in advance of an exam. Also, you should meet with your faculty member to discuss emergency medical information or how best to ensure your safe evacuation from the building in case of fire or other emergency.

University of Portland's Mental Health Statement:
As a college student, you may sometimes experience problems with your mental health that interfere with academic experiences and negatively impact daily life. If you or someone you know experiences mental health challenges at UP, please contact the University of Portland Health and Counseling Center in Orrico Hall (down the hill from Franz Hall and Mehling Hall) at https://www.up.edu/healthcenter/ or at 503-943-7134. Their services are free and confidential, and if necessary they can provide same day appointments. In addition, after-hours phone counseling is available if you call 503-943-7134 and press 3 outside of business hours. Also know that the University of Portland Public Safety Department (503-943-4444) has personnel trained to respond sensitively to mental health emergencies at all hours. Remember that getting help is a smart and courageous thing to do – for yourself, for those you care about, and for those who care about you.

University of Portland's Non-Violence Statement:
The University of Portland is committed to fostering a community free from all forms of violence in which all members feel safe and respected. Violence of any kind, and in particular acts of power-based personal violence, are inconsistent with our mission. Together, we take a stand against violence. Join us in learning more about campus and community resources, UP's prevention strategy, and reporting options on the Green Dot website, https://www.up.edu/greendot or the Title IX website https://www.up.edu/titleix .

University of Portland's Ethics of Information Statement:
The University of Portland is a community dedicated to the investigation and discovery of processes for thinking ethically and encouraging the development of ethical reasoning in the formation of the whole person. Using information ethically, as an element in open and honest scholarly endeavors, involves moral reasoning to determine the right way to access, create, distribute, and employ information including: considerations of intellectual property rights, fair use, information bias, censorship, and privacy. More information can be found in the Clark Library's guide to the Ethical Use of Information at libguides.up.edu/ethicaluse.

University of Portland's Learning Commons:
Trained peer tutors and writing assistants in the Learning Commons, located in Buckley Center 163, work with you to facilitate your active learning and mastery of skills and knowledge. For questions about the Learning Commons, please send all correspondence to Jeffrey White, Administrator, at white@up.edu. The Learning Commons is a program of the Shepard Academic Resource Center (SARC).

Math Resource Center: Appointment-based tutoring is available through our online scheduler at www.bit.ly/up_mrc. Walk-in tutoring Sundays through Thursdays evenings. For MTH 141, request appointments at math141@up.edu. The course-specific schedule can be found at www.up.edu/learningcommons, or the reception desk in BC 163.

Writing Assistance: Brainstorming ideas for your paper, create an outline, work on citations, or review a draft with a Writing Assistant. Visit www.up.edu/learningcommons to access our Writing Center schedule.

The Language Studio: Contact the language assistance hotlines to schedule a time to meet throughout the semester at chinesetutor@up.edu, frenchtutor@up.edu, germantutor@up.edu, or spanishtutor@up.edu.

Natural Sciences Center: Send your tutoring requests to biotutor@up.edu, chemtutor@up.edu, or physicstutor@up.edu.

Speech & Presentation Lab: Improve your presentations by requesting an appointment at speech@up.edu.

Group Work Lab: Make an appointment for your group project at groupwork@up.edu.
Nursing Tutoring: Tutoring is available for pathophysiology, BIO205, anatomy and physiology, and other nursing courses on a walk-in or appointment basis. Up-to-date schedule information is at www.up.edu/learningcommons/nursing.

Economics and Business Tutoring: For support in economics, OTM, finance, accounting, and business law courses, send requests for appointments to your discipline's tutor email hotline: econtutor@up.edu, otmtutor@up.edu, financetutor@up.edu, accountingtutor@up.edu, or bizlaw@up.edu.
Shiley Sophomore Fellows: Provides tutoring in several sophomore engineering classes. To make an appointment, send a request to stepUP@up.edu.

Learning Assistance Counselor: Learning assistance counseling is also available in BC 163. The counselor teaches learning strategies and skills that enable students to become more successful in their studies and future professions. The counselor provides strategies to assist students with reading and comprehension, note-taking and study, time management, test-taking, and learning and remembering. Appointments can be made in the on-line scheduler available to all students in Moodle or during posted drop-in hours.

University of Portland's Lab Access Statement:
Shop access is only allowed with appropriate training from shop technicians and with instructor permission. If students require card access to a laboratory, they must receive training from a technician. No food or beverages (including water bottles) are allowed in the computer classrooms, shop, or labs.