

PURDUE UNIVERSITY NORTH CENTRAL
Electrical and Computer Engineering Technology Department

ECET 15700

Electronics Circuit Analysis

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Office Hours: Mondays 4 - 5 pm and Tuesday / Thursday 2 – 5 pm.
Other days and/or times gladly arranged by appointment.

Course Website: www.pnc.edu/te/ECET15700

Required texts: A. H. Robbins & W. C. Miller, *Electronics Devices (Special Edition – Covers Ch 26-33 only)*, Thomson-Delmar Publishers, 2007.

Other required items:

- (1) Various electronics parts as required. (List will be distributed.)
- (2) ECET 107 / 109 / 157 / 159 Parts Kits and Tools.
- (3) TI-89 engineering calculator.
- (4) Ampad green grid paper for homework.

Course Objectives: This is the first course of a two-course sequence covering analog electronics. It assumes that you have some experience with electronics. I.E., you have taken ECET 107. You will probably find the material quite different from either the electrical circuits or digital electronics courses.

This course will introduce the student to linear ICs and their use in circuit design. Linear circuits are those which amplify, regulate or convert continuous electric signals, as opposed to digital circuits which process discrete, bit-by-bit information signals.

We will examine such circuits as a logic probe, window detector, LED voltmeter, electronic thermostat, amplifier, adder, subtracter, integrator, voltage/current converter, differential amplifier, analog-to-digital converter (ADC), digital-to-analog converter (DAC), oscillator, waveform generator and others. We will cover noise immunity, input and output impedances, slew rate, feedback and other circuit design considerations. We will cover various types of op amp circuits.

This course - - as is the approach of all Purdue ECET programs - - will stress the "hands-on". We will spend a few weeks introducing the diode and bipolar-junction transistor (BJT). Then, we will move on to op amps. Our text takes a chip-oriented approach, using the LM741 Op Amp IC as our work-horse op amp. Other ICs will also be covered.

Throughout this course, we will use PSPICE or LTSPICE extensively to simulate and verify circuit operation.

Laboratory: All labs, except the first, must be written into a formal report. Lab logbooks are, therefore, NOT needed. Specifics of the written reports will be distributed later.

Examinations: There will be two or three in-class, hour-long exams and a comprehensive final exam. Dates of the tests are shown on the attached syllabus.

Homework: Homework will be assigned, due and collected almost every class. It will be graded and returned the next class session. If you need a copy of the Homework Guidelines which you were given last year, please see me. Solutions will be posted on line, at the class website:

<http://www.pnc.edu/te/ECET15700>

Therefore, no late papers will be accepted.

Professional Activity: Various national trends are impacting upon our campus and universities nationwide. Among these trends are: an effort to make students aware of the need for professional development to keep their careers on track; more ties between the university and local industries; increasing the view of the university as part of the community and decreasing the view of the university as an “ivory tower.”

To help our ECET students plug-in to these worthy trends, the ECET faculty at Purdue University North Central have decided to require each student to participate in some sort of professional activity during each semester. Activities which fulfill the professional activity requirement include:

- Joining the campus IEEE Student Chapter.
- Writing a 5 - 10 page term paper, topic to be agreed upon by student and instructor.
- Participating in an out-reach activity between PUNC and a local high school.

If you feel that you have an idea which will fulfill the professional activity requirement and would like to use your idea in place of the suggested activities, please feel free to discuss your idea with me.

Participation in a professional activity will constitute ten percent of your grade in this course. We envision that each semester, at least one freshman and one sophomore ECET course will include this professional activity requirement as part of the course grade.

Grades:	Test #1	15	A = 90 points or more
	Test #2	15	B = 80 to 89 points
	Test #3	15	C = 70 to 79 points
	Final Exam	15	C = 70 to 79 points
	Homework	15	D = 60 to 69 points
	Lab grade	15	F = less than 60 points
	Professional Activity	<u>10</u>	
		100 points total	

NOTE: If there are only two exams, instead of three, then both exams and the final will each count 20 points toward your grade.

Conferences: I will be in my office Mondays 4 – 5 pm and Tuesday / Thursday, 2 – 5 pm. Also, I am in lab on Monday afternoons and evenings. These are usually the best times to catch me for help. Other times will gladly be arranged by appointment. If you are unable to find me or there is no answer on the phone, leave a voice-mail message or e-mail me. If you are having trouble with the material at any time during the semester, please see me before it is too late! It cannot be stressed enough that the material in this course builds upon itself. Therefore, if you miss something early in the semester, you may find that an avalanche has started! So, please see me as soon as you feel that you are falling behind!

Attendance: According to Purdue University and Purdue ECET Department policy, you are expected to attend all lectures and lab sessions. Also, you are expected to have read the material to be covered before coming to class! In the laboratory, you are expected to have read the assigned lab pages and to have made preliminary notes -- complete with circuit sketches, if these are called for. **FAILURE TO BE PREPARED IN THE LABORATORY WILL MEAN A GRADE OF ZERO FOR THAT WEEK'S EXPERIMENT!**