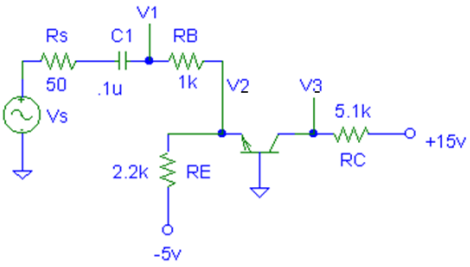
EELE 317 Electronics

Dept. of Electrical and Computer Engineering - Montana State University
Fall 2016 Course Syllabus (v.1)



Class meetings: MWF 9:00-9:50 Reid 402 *lecture section 001*
T 12:00-2:00 Cobl 620 *lab section 002*
T 2:10-4:00 Cobl 620 *lab section 003*
T 4:10-6:00 Cobl 620 *lab section 004*
R 2:10-4:00 Cobl 620 *lab section 005*

Course Description:

ELECTRONICS: A branch of electrical engineering; the science and technology based on and concerned with the controlled flow of electrons (or holes). This is an introductory course in electronics. It introduces diodes, field effect transistors, bipolar junction transistors, and bipolar and FET analog and digital circuits.

Prerequisite: EELE 203 (Circuits II)

Instructor:
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D2L Tab: Electronics CL - EELE_317_001t005_201670_CL
We will be using the Brightspace (Desire2Learn) learning management system for this course. The address is: https://ecat.montana.edu/d2l/home/414813 . You will log into this system using your MSU ID and password (the same as your MyInfo login). All course materials can be found on this site in addition to your current grades

and the most up-to-date course schedule. If you have technical difficulties with the system (i.e., can't login, the system is down, etc…), contact the MSU IT Center help desk at 994-3255 (D2LL).

Text: *Microelectronic Circuits*, 7th Edition, by Sedra and Smith (Oxford, 2015).

Course Components
This is a 4-credit course comprising both lecture and laboratory meetings. You must register for the lecture section plus one of the laboratory sections.

Lecture: The lecture component of this course will meet three times per week for 50 minutes. In lecture we will discuss new concepts, go over homework, take quizzes about the reading assignments, and take in-class exams. There will be homework assignments due most days that must be completed (paper and pencil) and turned in at the beginning of lecture for grading.

Laboratory: The laboratory portion of this course will provide hands-on experience with building, debugging and testing electronic circuits. We will use PSpice to simulate basic electronic devices and circuits. You will also build and characterize several circuits of your own design. You'll need a laboratory notebook, and you'll prepare four Lab Reports during the course of the semester. There is more detail about the lab portion of the course below.

Course Grading:

The course grade is computed as follows:

Homework and quizzes	15%
First Midterm Exam	20%
Second Midterm Exam	20%
Final Exam	20%
(The final exam is scheduled for Tuesday, Dec. 13 from 4:00 – 5:50pm)	
Laboratory Grade	25%

The laboratory grade will be composed of several parts as follows:

Attendance	≤ 2 unexcused absences for passing grade
Notebooks	25%
Pre-labs	15%
Formal reports	60%

Passing the laboratory portion of the course requires a score of at least 50% for the laboratory grade. You must pass the laboratory portion of the class to pass EELE317.

You will keep a laboratory notebook documenting all of your experiments and calculations in the lab. This notebook should be bound, with numbered pages. Notebooks will be handed in for grading on the following dates:

September 14 or 16 (one day after your second lab period, by **5:00pm outside my office**)
December 9 (by **5:00pm outside my office**)

The notebook grade will be awarded based on completeness of recorded data, including diagrams of circuits, complete description of signal sources and measurement techniques, tabular data and graphical data, along with enough narrative to describe the experiments. Neatness counts.

Pre-labs are to be completed *in your notebooks,* preceding the day's experimental data. You must have the lab instructor initialize the pre-lab at the beginning of the lab period. Pre-labs without the instructor's initials will receive zero credit. Pre-labs will be graded at the same time that notebooks are graded.

You will be required to hand in four formal lab reports. These will be due according to the following schedule:

First report on or before	September 26
Second report on or before	October 17
Third report on or before	November 21
Fourth report on or before	December 5

The format for formal lab reports will be provided in a separate document.

Late work policy
Late work will not be accepted.

Collaboration policy
In general, working with other students in this course is encouraged. However, all assignments turned in for grading must: (1) be wholly and completely the work of the author (2) reflect each individual student's understanding of the course material. For example, you will work with a partner on the laboratory exercises. You are encouraged to work together to figure out any challenging aspects of the exercise, and help each other debug your circuits. Each student should then individually prepare her/his own lab write-up. You and your partner might both have the same experimental data in your reports; however, your analysis and interpretation of these results should NOT be identical! In other words, you may work with others to improve your understanding of course concepts, but by the time you turn in an assignment for grading, you should be able to do the entire assignment by yourself.

Cheating (or any other form of academic misconduct) on any graded component of this course will not be tolerated, and will be penalized in accordance with MSU policy. In general, this course will follow the policies described in the Conduct Guidelines and Grievance Procedures for Students (http://www2.montana.edu/policy/student_conduct/student_conduct_code.htm).

Personal electronics policy
To avoid distracting your classmates and your instructors, please turn off (or at least put into silent mode) any cell phones or other personal electronic devices. If you absolutely must take a call, send/receive a text or otherwise use a personal electronic device, please excuse yourself from the classroom or laboratory.

What you should expect from this class

After completing this class, you should be familiar with the following electronics topics:

- operational amplifier device properties

- operational amplifier circuits
- *pn* junction diode forward and reverse I-V characteristics
- zener diodes and applications
- spice modeling of *pn* junction diodes
- field effect transistor (FET)
- FET dc biasing
- FET modeled as a two-port device
- FET ac analysis
- spice modeling of FET circuits
- integrated circuit MOSFET circuit design concepts
- bipolar junction transistor (bjt)
- bjt dc biasing
- bjt modeled as a two-port device
- bjt ac analysis
- common emitter, common base and common collector configurations
- spice modeling of bjt circuits
- output stage amplifiers
- CMOS and TTL logic building blocks
- CMOS and TTL properties

In addition, you will have experience doing the following:

- correctly using electronic test equipment including multimeter, oscilloscope and curve tracer, and interpreting your measurements
- keeping a professional lab notebook
- composing a report describing experimental work you conducted
- working from a specification to synthesize a circuit design
- simulate, build, debug, revise and report on circuits of your own design