

## Physics 313: Electronics Fall 2019

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**My Webpage:** <http://userpages.wittenberg.edu/pvoytas/index.html>  
**Class Web site:** [http://userpages.wittenberg.edu/pvoytas/courses/p313\\_f19/index.html](http://userpages.wittenberg.edu/pvoytas/courses/p313_f19/index.html), where homework and reading assignments and other material for the course will be available.

### **Text: Electronics with Discrete Components**

[Enrique J. Galvez](#)

ISBN: 978-0-470-88968-8

Additional Resources:

My text/notes (see web site)

online text: <http://en.wikibooks.org/wiki/Electronics>

**Course description:** An introduction to electronics (mostly analog). The emphasis will be on a hands-on, practical understanding of circuit elements, and so the labs are the central part of the course. Readings and homework will supplement and support the lab exercises. This is a half-semester course meeting for 3 hours twice a week.

### **Office hours:**

**MWF:** 2:15-3:20

**M:** 3:30-4:35

**R:** 4:30-5:30

<b>Grading policy:</b>	laboratory work.....	35%
	assignments.....	20%
	midterm.....	20%
	final.....	<u>25%</u>
	<b>TOTAL</b>	<b>100%</b>

Letter grades will be assigned according to the percentage of possible points you have accumulated at the end of the semester. You are guaranteed that the divisions between grades will be no higher than the following:  $90\% \leq A^-$ ,  $A \leq 100\%$ ,  $80\% \leq B^-$ ,  $B \leq 90\%$ ,  $70\% \leq C^-$ ,  $C \leq 80\%$ ,  $60\% \leq D^-$ ,  $D \leq 70\%$ ,  $F < 60\%$ . In borderline cases, attendance, class participation, and trend in exam scores will be used to decide whether to award the higher grade.

### **Accommodations:**

"Wittenberg University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, learning, chronic health, physical, hearing, vision and neurological, or temporary medical conditions, etc.) Please, let me know immediately so that we can privately discuss options. To establish reasonable accommodations, you must register with Accessibility Services by contacting Jamie Rippey, the Director of Accessibility Services at 937-327-7870 or by email at [rippyj@wittenberg.edu](mailto:rippyj@wittenberg.edu). Please note that services are confidential and may take time to put into place, and are not retroactive. The Accessibility Services Office is located in the Office of Academic Services COMPASS Sweet Success Center, Thomas Library on the first floor. Walk-in appointments are welcome 8 AM to 5 PM, Monday through Friday."

**Labs:** Record all your work in lab in a permanently-bound quadrille-ruled notebook in ink. Computer-generated plots and similar materials must be taped (all 4 corners, no stapling) into the book. The notebooks will normally be collected after each lab handout is completed for grading.

**Readings and homework:** Reading, problems, and questions will generally be assigned for each class period and will be due at the beginning of the next class. Some will be over material covered the previous class/lab period (review questions), and some will be over the material for the upcoming class period (preparation questions). Late homework will be accepted for half credit until the beginning of the next class after the assignment was due.

**Exams:** There will be a midterm exam after the first half of the course as well as a comprehensive final exam. Both exams will have a written part, which will be closed-book, emphasizing the application of fundamental principles to circuits like those you've seen in lab, and a **lab practical** part, which will be open lab book, emphasizing building circuits, diagnosing circuit problems, making measurements, and interpreting those measurements.

**Attendance:** Unless something physically prevents you from doing so, contact me *before* class if you are going to be absent. Makeup labs and exams will be available only in cases of excused absences.

**Tentative (and optimistic) course schedule:**

date	Topics	readings
T Aug. 20	DC circuits, instrumentation (lab 1)	1.1-1.5, 1.7-1.8.4, 6.2.1, 6.2.2
R Aug. 22	Voltage dividers, Thévenin theorem (lab 1)	
T Aug. 27	AC circuits and measurements; RC integrator, low-pass filter (lab 2)	
R Aug. 29	RC differentiator, high-pass filter; oscilloscope impedance (lab 2)	
T Sept. 3	Diodes and diode circuits (lab 3)	
R Sept. 5	Diode circuits: rectifiers and voltage regulation (lab 3)	
T Sept. 10	<b>Exam 1</b>	
R Sept. 12	Bipolar transistor properties (lab 4)	
T Sept. 17	Transistor circuits (lab 4)	
R Sept. 19	More transistor circuits (lab 4)	
T Sept. 24	Op amp properties and circuits; Golden Rules (lab 6)	
R Sept. 26	Op amp circuits (lab 6)	
T Oct. 1	Op amp circuits (lab 6)	
R Oct. 3	Comparators and oscillators (lab 7)	
T Oct. 8	<b>Final exam</b>	

Departmental Learning Goals for this course:

- Have an understanding of some aspects of the relationship between science and technology.
- Qualitatively describe the behavior of some natural world phenomena in terms of fundamental physical laws.
- Have some understanding as to what constitutes a physical measurement and some of the techniques by which physical measurements are made.
- Design and conduct experiments at a reasonably sophisticated level.