

**University of Portland**  
**School of Engineering**

**EE 271 – Electrical Circuits Laboratory – 1 credit hour**

**Fall 2016**

**Course Outline**

**Purpose:** The goal of this laboratory is to teach the students how to construct and test simple electrical circuits, measure various physical quantities, such as voltage, current, and resistance, using different types of test instruments, and verify the relationships as well as observe and record the differences between theory and practice.

**Learning Objectives:** At the successful completion of this course, the student is expected to gain the following skills:

- Become familiar with the basic circuit components and know how to connect them to make a real electrical circuit;
- Become familiar with basic electrical measurement instruments and know how to use them to make different types of measurements;
- Be able to verify the laws and principles of electrical circuits, understand the relationships and differences between theory and practice;
- Be able to gain practical experience related to electrical circuits, stimulate more interest and motivation for further studies of electrical circuits; and
- Be able to carefully and thoroughly document and analyze experimental work.

**Co-requisite:** EE 261—Electrical Circuits

**Instructor:** EE 271-Section A—W 14:40-17:40  
EE 271-Section B—Th 14:30-17:30  
Dr. Aziz S. Inan  
Phone#: 503-943-7429; Fax#: 503-943-7316  
E-mail: [ainan@up.edu](mailto:ainan@up.edu)  
Office: Shiley Hall 215

**Lab Location:** Shiley Hall 309

**Textbook** A lab manual will be provided.  
**Notebook:** Every student is required to have a lab notebook to be used for reporting their lab work. The lab notebook brand should

be *Roaring Spring* Compositions, which is a QUAD. RULED, 5 lines to 1", 9¾ in. X 7½ in., sewn-binding, 100-page notebook. It is available at UP Bookstore.

**Lab Experiments:** Each experiment is designed for one lab period (i.e., ~3 hours) unless stated otherwise.

**Lab Dates:** The lab dates are tentatively scheduled as follows:

No lab on August 31 & September 1, 2016 (First week)

Exp. # 0—Intro. to EE 271 Lab—September 7 & 8, 2016

Exp. # 1—Ohm's & Kirchhoff's Laws—September 7 & 8, 2016

Exp. # 2—Simple Resistive Circuits—September 14 & 15, 2016

Fun Project—September 21 & 22, 2016

Exp. # 4—Electrical Circuit Theorems—September 28 & 29, 2016

Exp. # 5—DAC R-2R Ladder Network\*—(Take-Home)—October 5 & 6, 2016

No lab on October 12 & 13, 2016

No lab on October 19 & 20, 2016 (Fall Break)

Exp. # 6—Intro. to Oscilloscope & Op-Amp Circuits—October 26 & 27, 2016

Exp. # 3—Wheatstone-Bridge Circuit & Strain Gage Sensors—November 2 & 3, 2016

Exp. # 7—First-Order RC Circuits—November 9 & 10, 2016

Exp. # 8—Second-Order RLC Circuits—November 16 & 17, 2016

No lab on November 23 & 24, 2016 (Thanksgiving Break)

No lab on December 7 & 8, 2016 (Dead week)

\*Formal lab report

### **Assessment/**

#### **Grades:**

The total score and grade for the course will be computed based on the following percentages:

- 30% for lab quizzes
- 30% for the lab notebook (based on performance on the pre-lab assignments, accuracy and presentation of the measurements, error analyses, discussions and conclusions; completeness, organization, and neatness of the lab notebook applies to both the pre-lab and the lab assessments)
- 30% formal lab report
- 10% for lab performance

The final letter grade for the course is assigned based on the following total score/grade brackets over a scale of 100 possible points:

- 90–100      A<sup>-</sup>-A (Excellent Performance)
- 80–89      B<sup>-</sup>-B<sup>+</sup> (Good Performance)
- 70–79      C<sup>-</sup>-C<sup>+</sup> (Average Performance)

- 60–69 D–D+ (Poor Performance)
- <60 F (Inadequate Performance)

**Pre-lab****Assignments:**

Pre-lab assignments will be assigned for each experiment. These pre-lab assignments are mandatory, that is, every student is expected to complete these assignments before coming to the lab.

**Lab Quizzes:**

There will be a 15-minute lab quiz at the beginning of some of the lab periods. The lab quizzes will mostly be on the pre-lab assignments of that week's experiment.

**UP's Code of Academic Integrity:**

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.

**UP's Disabilities Statement:**

If you have a disability and require an accommodation to fully participate in this class, contact Accessible Education Services (AES) located in Buckley Center 163 as soon as possible. If you have an AES Accommodation Plan, you should make an appointment to meet with me to discuss your accommodations. Also, you should meet with me if you wish to discuss emergency medical information or special arrangements in case the building must be evacuated.

**UP's Assessment Disclosure Statement:**

Student work products for this course may be used by the University for educational quality assurance purposes.

**UP's Accessible Education Services (AES):**

Students who experience a disability and require an accommodation to fully participate in this class, contact the Accessible Education Services office located in Buckley Center, Rm. 163 or call 503-943-8985. If you have an AES

accommodation plan that includes academic accommodations that apply to this course, make an appointment to meet with the professor to discuss how your accommodation will be implemented. You are responsible for giving sufficient notice to your professor for timely implementation of your accommodation; therefore, it is recommended that you speak with your professor in the first week of the semester or as soon as your accommodation plan is activated. Also, meet with the professor if you have an AES Safety Plan and/or wish to discuss emergency medical information or special arrangements in case the building must be evacuated. Requests for an alternate location for exams and/or extended exam time should, when possible, be made two weeks in advance of an exam, and must be made at least one week in advance of an exam.

**UP's Green Dot Statement:**

University of Portland Faculty, Staff, and Students are committed to creating a community free from interpersonal violence, in which all members feel safe and respected. Each of us has a personal responsibility to reject violence or intimidation of any kind. Resources for those experiencing or wishing to report violence can be found on our Community Against Violence website: <http://www.up.edu/cav/>.

**UP's Shepard Academic Resource Center (SARC):**

The Learning Resource Center, located on the first floor of Buckley Center within SARC (BC 163), provides peer assistance tutoring for writing, math, speech and presentations, languages, business and economics, sciences and nursing. For complete information about SARC, go to <http://www.up.edu/sfrc/default.aspx?cid=13615&pid=8862>

**UP's Transportation Policy:**

If you plan to drive to off-campus events as part of this course, you must read the University Vehicle and Transportation Policy for Students: <http://www.up.edu/showingimage/show.aspx?file=21092>. The policy requires drivers of private or University vehicles to attend a one-time safe driving course, offered by Public Safety, and to submit a trip itinerary to Public Safety prior to each off-campus trip. The itinerary form must be signed by the instructor.