University of Portland (UP)
School of Engineering

EE 271 – Electrical Circuits Laboratory– 1 cr. hr.
Fall 2019
Course Syllabus

Course Description: Measurement experience with a variety of basic electrical instruments. The student engineer will verify many of the principles of electrical circuit theory. Fee: $50

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

- **Student Outcome (SO) 6:** An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions;
  - **Performance Indicators (PIs) for SO 6:**
    - A. Can develop and conduct experiments to acquire data
    - B. Can analyze and interpret data
    - C. Can use sound engineering judgement to draw conclusions from data
- 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.

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Office Hours: T 9:00-11:00am; W 11:20am-1:20pm; F 2:30-3:30pm
Lecture Hours: W 14:40-17:40 (Location: SH 309)

Experiment Handouts: Available at sites.up.edu/ee271/

Co-requisite: EE 261

Grading Policy: The total numerical grade is computed based on the following percentages:
- 25% for quizzes
- 50% for lab reports
- 25% for lab performance, and

The final letter grade in the course is assigned based on the following total numerical grade intervals out of a total of 100 points:

90–100 A−-A (Excellent Performance)
80–89 B−-B+ (Good Performance)
70–79 C−-C+ (Average Performance)
60–69 D−-D+ (Poor Performance)
<60 F (Inadequate Performance)

Typically, the average of the total numerical grades is B−.

Lab Experiments & Dates:
The lab experiments & dates are tentatively set as follows:

| Experiment #1: Digital Multi-meter—August 28, 2019 |
| Experiment #2: Ohms Law (RTD Datasheet)—September 4, 2019 |
| Experiment #3: Kirchhoffs Laws—September 11, 2019 |
| Experiment #4: Superposition—September 18, 2019 |
| Experiment #5: Oscilloscope—September 25, 2019 |
| (AudioFiles: Note, SignalA, PinchMeExcerpt, Speech1, CarHorn1, AlsoSprachZarathustraExcerpt, Noise) |
| Experiment #6: Digital-to-Analog Converter and Soldering Workshop—October 2, 2019 |
| (Soldering Tutorial Video – Soldering Tips – Water Detector Circuit – Photos – 2N3906 Datasheet) |
| Experiment #7: Analog-to-Digital Converter—October 9, 2019 |
| Experiment #8: Op Amps (LM741 Op Amp Datasheet)—October 23, 2019 |
| Experiment #9: Strain Gauge—October 30, 2019 |
| Experiment #10: Arduino—November 6, 2019 |
| Experiment #11: Design an Energy-Saving Device—November 13, 2019 |
| Experiment #12: Capacitors—November 20, 2019 |
| (Audio File: speech_noise, LM386 Audio Amp Datasheet) |
| Experiment #13: Inductors—December 4, 2019 |

No-class Dates: Monday-Friday, October 14 through 18, 2019 (Fall Break)
University of Portland’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.

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 Accessibility 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, fricntutor@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: econ tutor@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.