Portland State University
Electrical & Computer Engineering

-EE 347 Electrical Power Systems I Lab-

Co-requisite: EE 347, Power Systems I Lecture

Instructors: Robert Bass, Ph.D.

Office Hours: Tuesday, 2:00pm-2:50pm. Discord.

Description: Measurement and characterization of electrical power systems, including single- and three-phase phase power circuits, power factor correction, power transformers and transmission/distribution systems. Emphasis is placed on oral presentations and written laboratory reports containing circuit schematics, calculations, measured data and analysis of experimental procedures.

References: "Draft of Proposed NFPA 70," 2014 Edition, National Fire Protection Association, (NEC: National Electric Code)
www.nfpa.org/Assets/files/AboutTheCodes/70/70-A2013-ROPDraft.pdf

Required Lab Supplies: Lockout padlock & lockout tag
These are available in the PSU EPL store.

Instruction: The class will meet once per week for three hours. Laboratory activities include three laboratories focused on different aspects of electrical power systems.

Students shall abide by the course Homework Expectations, the Late Homework Policy, the Assignment Dispute Policy, the Lab Badge Access Policy, the Lab Lock-out-Tag-out Policy, and the Student Codes of Conduct.

Meeting Times: EE 347 L01: Friday, 9am-11:50am
EE 347 L02: Friday, 12pm-2:50pm
EE 347 L03: Friday, 3pm-5:50pm

Grading and Scale:

Lab (35%): Electrical Safety Quiz - 5%, Lab written reports - 25%, Team assessments - 5%. Instructor discretion may be applied to boundaries between letter grades.

A	B	C	D
> 90%	> 80%	> 70%	> 60%

Student group participation will be assessed using Catme, a 360 team evaluation tool. Two surveys will be conducted during the term.

Students are required to participate in all labs and are expected to contribute to all laboratory reports. Every student's contribution shall be commensurate with those

of each other team member. If a student does not meaningfully contribute to one laboratory report, they shall receive no credit for any laboratory reports.

If you have a dispute regarding the grading of an assignment, follow the instructions listed in the Grade Dispute Form, posted in Canvas. Do not ask the instructor or TA to review a dispute other than through this process.

Course Objectives:

Upon completion of EE 347 Lab, students should be able to:

1. Follow safe electrical work practices
2. Use power supplies, wattmeters and multimeters to measure three-phase power systems
3. Verify through experimentation the concepts of power factor and capacitive power factor correction.
4. Design, simulate and verify transformer circuits, including single-phase, three-phase, regulating and auto-transformers.
5. Design, simulate, and verify transmission line systems

Assignments:

Students **must attend laboratory sessions in order to receive credit for this course.**

1. Electrical Safety Quiz - Students *must passes* this quiz with an 80% or greater before working with the 120/208VAC power supplies beyond Week 1.
2. Five lab reports covering various power system topics. Students need not perform the labs in any particular order. All lab reports must be written using the Power Lab LaTeX template.

Lab Schedule:

	Tasks	**Lab Action Items**
Week 1	Lab 1, Power Lab Intro	Electrical Safety Quiz
Week 2		Lab 0 Memo, Monday
Week 3	Lab 2, 1φ & 3φ Power, PFC	Lab Report 1, Friday
Week 4		
Week 5	Lab 3, Harmonics	Lab Report 2, Friday
Week 6		
Week 7	Lab 4, 1φ Transformers	Lab Reports 3, Friday
Week 8		
Week 9	Lab 5, 3φ Transformers	Lab Reports 4, Friday
Week 10		
Week 11		Lab Reports 5, Friday

Any student with a disability who anticipates a need for accommodation in this course is encouraged to talk to the instructor about their needs as soon as possible.