ECE 436/536 - Power System Protection  
Winter 2019, 3 credits  
Tue, Thu 10:00-11:20am, KEC 1003


Professor: Dr. Eduardo Cotilla-Sanchez  
Office: KEC 3023, email: ecs@oregonstate.edu, Tel: 541-737-8926  
Office hours: Thu. 11:30am-12:30pm, or by appointment.

Teaching Assistant: Adam Mate  
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Office hours: Wed. 11:30-1:00pm.

Course Content:
- Introduction to protective relaying
- Review: per unit system, symmetrical components, fault analysis
- Relay input sources
- Protection design fundamentals
- Bus protection
- Transmission line protection
- Generator and motor protection
- Stability and load shedding

Measurable Student Learning Outcomes:
Upon completing this course, students will be able to...

1. Calculate performance of current and voltage transformers. (ABET outcomes: A, E, K)
2. Describe and analyze fundamental protection schemes: overcurrent and distance. (ABET outcomes: A, E, K)
3. Design, evaluate and compare bus protection architectures. (ABET outcomes: A, E, K, c)
4. Design, evaluate and compare transmission line protection schemes. (ABET outcomes: A, E, K, c)
5. Describe methods to protect generators and motors of different saliency within the system. (ABET outcomes: A, E, K, c)
6. Describe load shedding mechanisms and their impact in power system stability. (ABET outcomes: A, E, K, c)

Grading:
- Homework 25%
- Research paper discussion/write up 25%
- Midterm exam 25%
- Final exam (comprehensive) 25%

Learning Resources:
- Class lecture notes

**Statement regarding students with disabilities:**
Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at [http://ds.oregonstate.edu](http://ds.oregonstate.edu). DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

**Course ethics:**
Students are expected to uphold high ethical standards in this course including adherence to Oregon State University Academic Regulations and Student Regulations. You are permitted and to a great extent encouraged to seek the advice of others. However, there is an obvious difference between a constructive discussion about a homework assignment with a classmate and copying a classmate’s homework. Copying is not permitted. OSU Expectations for Student Conduct: [http://oregonstate.edu/studentconduct/offenses-0](http://oregonstate.edu/studentconduct/offenses-0)

**Inclusion, equity, and diversity:**
This course strives to create an affirming climate for all students including underrepresented and marginalized individuals and groups. Diversity encompasses differences in age, color, ethnicity, national origin, gender, physical or mental ability, religion, socioeconomic background, veteran status, sexual orientation, and marginalized groups. We believe diversity is the synergy, connection, acceptance, and mutual learning fostered by the interaction of different human characteristics.

**Graduate Student (536) Requirements:**
• Graduate students are required to complete additional homework and project tasks.
• Graduate students are required to use a document preparation system (LaTeX) for homework and projects.

**Remarks:**
• Students may not use laptops, cell phones, or other electronic devices in this classroom. If you expect this will pose an undue hardship for your learning, please speak with the instructor.
• You will be allowed one (1) handwritten sheet of notes to use on exams (one-side letter paper for midterm exam, two-side letter paper for final exam).

Revised: 9-15-18