ECE 433 – Power Systems Analysis

Catalog Description: Fundamentals and control of real and reactive power, steady-state load flow studies, unbalance, stability and transient system analysis.

Credits: 4 **Terms Offered:** Fall

Prerequisites: ECE 352

Courses that require this as a prerequisite: ECE 437/537, ECE 536

Structure: Two 110-minute lectures per week

Instructors: Eduardo Cotilla-Sanchez, Annette von Jouanne

Course Content:

- Fundamentals of three-phase power systems, history, deregulation, per unit
- Network and component modeling
- System solutions (power ow project using PowerWorld and MATLAB)
- Symmetrical components
- Fault studies (project using PowerWorld and MATLAB)
- Control of active and reactive power, voltage control
- Power system stability
- Power quality

Measurable Student Learning Outcomes:
At the completion of the course, students will be able to…

1. **Perform** fundamental three-phase power system calculations. (ABET outcomes: A, c, e, k)
2. **Solve** practical steady-state power system problems. (ABET outcomes: A, b, c, e, j, k)
3. **Conduct** a power ow study and implement in PowerWorld Simulator and MATLAB. (ABET outcomes: A, b, c, e, j, k)
4. **Conduct** a fault study and solve using PowerWorld Simulator and MATLAB. (ABET outcomes: A, b, c, e, j, k)

Graduate students are required to do additional project tasks, such as numerical solution of the power flow problem using MATLAB (in addition to the PowerWorld Simulator).

Learning Resources:

- Glover, Sarma, Overbye \Power System Analysis & Design", 5th Ed, 2012.

Accommodations:
Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098. The University will grant students reasonable requests for religious accommodations

where doing so does not conflict with reasonably necessary University goals (reasonable accommodation). The Religious Accommodation Policy document is maintained in the Office of Equity and Inclusion, oregonstate.edu/oei/religious-accommodation-policy

Graduate Student Requirements:

- Graduate students are required to complete additional homework and project tasks.
- Graduate students (533) are required to use a document preparation system (such as LaTeX) for homework and projects.

Link to Statement of Expectations for Student Conduct:
http://oregonstate.edu/admin/stucon/achon.htm

Revised: 5/24/07
Revised: 7/11/13