

Department of Electrical and Computer Engineering

1. Course number and name
ECE 442 – Power Systems Analysis
2. Credits and contact hours
3 credit hours, 3 contact hours
3. Instructor's or course coordinator's name
Walid Hubbi
4. Text book, title, author and year
"Power System Analysis and Design," by Glover, Sarma, and Overbye, ISBN 978-1-111-42577-7, 5th ed., Publisher: Cengage Learning.
5. Specific course information
 - a. (Catalog Description): Introduction to power plants and power networks. Topics include transmission line parameters, system modeling, economic operations of power systems, load flow studies, short circuit analysis, and power system stability.
 - b. Prerequisites: ECE 341.
 - c. indicate whether a required, elective, or selected elective
Elective course, required by students taking the power track.
6. Specific goals for the course, criterion 3 outcomes addressed are in parentheses:
 - a. Acquire a basic understanding of the important components of modern power systems and how they work together to give a high-performance system (1)
 - b. Understand how to compute series impedance and shunt capacitance of transmission lines for balanced three-phase operation including bundled and parallel circuits (1).
 - c. Assess the performance of a power line in terms of power transfer limit and voltage profile (1).
 - d. Determine the stability and operating limits of synchronous generators and transmission lines connected to large power systems (1, 6).
 - e. Evaluate what compensation is required to improve the stability and the voltage profile (1).
 - f. Determine most economic generation schedule among power stations (1 4)
 - g. Determine fault current levels under different fault conditions (1).
7. Brief list of topics to be covered
 - a. Balanced three phase circuit theory and associated grounding.
 - b. Synchronous generator - performance on an infinite busbar system.
 - c. Transformer models.
 - d. Transmission line parameters.
 - e. Transmission line modelling.
 - f. Power flow analysis.

- g. Economic operation of power systems
- h. Balanced and unbalanced faults - the method of Symmetrical Components.

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