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 (a
   b. Understand how to compute series impedance and shunt capacitance of transmission lines for balanced three-phase operation including bundled and parallel circuits (a, k).
   c. Assess the performance of a power line in terms of power transfer limit and voltage profile (a).
   d. Determine the stability and operating limits of synchronous generators and transmission lines connected to large power systems (a, b).
   e. Evaluate what compensation is required to improve the stability and the voltage profile (a, k).
   f. Determine most economic generation schedule among power stations (e, h, k)
   g. Determine fault current levels under different fault conditions (a, e, k).

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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Office Hours: Mondays, Tuesdays and Wednesdays 1:00-2:00 or by appt.