EEE 471 Power System Analysis (3) [S]

Course (Catalog) Description:
Review of transmission line parameter calculation. Zero sequence impedance, symmetrical components for fault analysis, power flow analysis, power system stability, and power system control concepts.
Lecture. Technical Elective.

Prerequisite:
EEE 360.

Textbook:
J.D. Glover, M. Sarma, T. J. Overbye, *Power System Analysis & Design*, 5th Edition, Thomson Learning, 2008, ISBN -13: 978-1-111-42577-79 (includes all course software).

Supplemental Material:
Blackboard: EEE471/591, Power System Analysis.

Coordinator:
V. Vittal, Professor

Prerequisites by Topic:
1. Three-phase system and phasor analysis
2. Power system components
3. Mesh and node equations
4. Computer programming (Fortran or Matlab)

Course Objective:
1. Students are familiar with power system elements and have basic skills for power-system analysis

Course Outcome:
1. Students are familiar with power-system elements and have basic skills for power-system analysis including proficiency in the application of power system analysis software

Course Topics:
1. Review of fundamentals (2 classes)
2. Symmetrical component fundamentals (2 classes)
3. Transformer modeling (3 classes)
4. Transmission line modeling (5 classes)
5. Transmission line operation (3 classes)
6. Power flow fundamentals (3 classes)
7. Power flow control (2 classes)
8. Power system stability (4 classes)
9. Power system control (3 classes)
10. Tests (3 classes)

Computer Usage:
Application of power flow and stability programs.

Laboratory Experiments: None.

Course Contribution to Engineering Science and Design:
Two projects include a skeleton high-voltage power system computer model and a set of system performance criteria. Using modern software, the student performs system analysis leading to the addition of elements and controls to the system so that it meets the criteria for stability, voltage control, and transmission line capability.

Course Relationship to Program Outcomes:
The project trains the students to develop models appropriate to a given problem using assumptions, estimates, and approximations guided by sound engineering judgement (**a,c**). The homework assignments help the students identify, formulate, and solve engineering problems (**e,k**). The lectures prepare the students to understand the mathematics and physics necessary to solve a broad range of power-system problems (**a**).

Person preparing this description and date of preparation: Vijay Vittal, February 2015