COURSE	Name	: Power System Analysis
	Code	: EE185710
	Credit(s)	: 2
	Semester	: (Elective Course)

Description of Course

The power system analysis course discusses the calculation and simulation of power flow in electric power systems using several methods such as Gauss Seidel, Newton Raphson and Fast Decoupled methods. In addition, this course discusses short circuit analysis both symmetry and non-symmetry. Then, a transient stability analysis using the same broad criteria method will be discussed.

Learning Outcomes

Knowledge

(P01) Mastering the concepts and principles of science in a comprehensive manner, and to develop procedures and strategies needed for the analysis and design of systems related to the field of power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics as a preparation for further education or professional career.

Specific Skill

(KK01) Being able to formulate engineering problems with new ideas for the development of technology in power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics.

General Skill

(KU11) Being able to implement information and communication technology in the context of execution of his/her work.

Attitude

(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently.

(S12) Working together to be able to make the most of his/her potential

Course Learning Outcomes

Knowledge

Mastering the concept of simulating a 3 phase ac power system based on a 1 phase circuit calculation in a steady state / transient and symmetry / no symmetry state.

Specific Skill

Able to analyze 3-phase ac power system in a steady state / transient and symmetric / unymmetric state using MATLAB software.

General Skill

Able to use MATLAB software to simulate and analyze electric power systems

Attitude

Demonstrating the attitude of being responsible for work in the field of expertise in the Simulation and Analysis of electric power systems independently.

Working together to be able to make the most of his/her potential.

Main Subjects

1. The basic concept of power system analysis
2. Modeling: main component models, inline diagrams, impedance / admitance diagrams, units per unit, circuit models (Ybus, Zbus), mathematical models (power flow equations)
3. Power Flow Simulation and Analysis: Gauss-Seidel method, Newton Raphson method, Fast Decoupled method
4. Basic concept of short circuit on electric power systems
5. The Z-bus method is applied to the simulation and short circuit analysis of 3 symmetry phases
6. Symmetry Component Theory
7. Short circuit simulation and analysis using symmetry component theory.
8. Basic concept of stability in electric power systems
9. Stability Simulation and Analysis.

Reference(s)

[1] John J. Grainger, William D. Stevenson, Jr., "Power System Analysis", McGraw-Hill Inc, 1994.
[2] Hadi Saadat, “Power System Analysis”, McGraw-Hill Inc, 1999
[3] M.E. El-Hawary, "Electric Power Systems : Design and Analysis", Reston Publiishing Company, 1983.
[4] C.A. Gross, " Power System Analysis", 2nd Edition, John Wiley & Sons,1983.
[5] Turan Gonen, "Modern Power System Analysis", John Wiley & Sons, 1988.

Prerequisite(s)

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