

Course 102 Power System Fundamentals 2

Course Objectives

The main objective of this 2-day course is to present advanced subjects in power system analysis, applying the information provided in Power System Fundamentals 1.

The course presents the basics of power system dynamics including a review of the fundamental of dynamic devices and their modeling. Using this background, the concept of power system stability is introduced from theoretical and practical perspectives. Finally, an introduction to the methods for dynamic analysis is provided.

Following the course, students should be able to understand,

- How steady-state analysis is performed on practical power systems
- The important dynamic characteristics of power system devices
- How to model dynamic devices
- The basic concept of stability and the salient features of the different forms of stability
- What methods and tools are suitable for dynamic analysis

Course Delivery

The course will be delivered in classroom presentations, aided by computer software for steady state and dynamic analysis. The presentation slides will be handed out to the students as the course notes. A short multiple-choice examination will be given at the end of the course.

Instructor

To be determined

Recommended Prerequisites

Power System Fundamentals 1

Course Outline

Session 1

- Advanced Steady-state Analysis of Power Systems
 - Modeling of HVDC lines and FACTS devices
 - Powerflow solution methods and controls
 - Steady-state security criteria
 - Contingency analysis
 - Power system protection
 - Practical application of steady-state analysis methods

Session 2

- Fundamentals of Power System Dynamics
 - Introduction to system dynamics
 - Dynamic characteristics of power system devices
 - Modeling of dynamic devices

Session 3

- Basics of Power System Stability
 - Introduction and classification of stability
 - Rotor angle stability
 - Transient Stability
 - Small Signal Stability
 - Time Domain Simulation
 - Eigenvalue Analysis

Session 4

- Basics of Power System Stability
 - Voltage stability
 - Frequency stability
 - Practical Application of steady-state and dynamic analysis