

Course 102

## **Power System Fundamentals II**

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### **Course Objectives**

The main objective of this course is to continue the topics in power system analysis, with the information provided in Course 101 – Power System Fundamentals I. The course presents the advanced state-steady analysis of power systems and the basics of power system dynamics. The concept of power system stability is introduced from theoretical and practical perspectives.

Following the course, students should be able to,

- Understand the principles of the advanced steady-state analysis of power systems
- Understand the important dynamic characteristics of power system devices
- Understand the principles for modeling dynamic devices
- Understand the basic concept of stability and the salient features of the different forms of stability

### **Course Delivery**

The course will be delivered in classroom presentations, aided by computer software including powerflow and stability programs for power system dynamics analysis. The presentation slides will be handed out to the students as the course notes.

### **Instructor**

To be determined.

### **Recommended Prerequisites**

Course 101 – Power System Fundamentals I.

### **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
  - Voltage stability
  - Transient stability
  - Small signal stability
  - Frequency stability
  - Practical application of steady-state and dynamic analysis

Note that the actual contents of this course offered on specific dates may be customized from the above. Please check with Powertech for details.