

EE6511 POWER SYSTEM MODELLING AND CONTROL

Academic Unit: 3.0
Prerequisite: Nil
Effective: Acad Year 2006/07
Last update: January 2006

OBJECTIVE

The objective of this course is to provide the attendees with comprehensive knowledge on power system modelling and control. This would include modelling of power networks, generating units and loads, the fundamental concept of power system stability and methods of analysis along with control techniques for stability enhancement. Knowledge on advanced methods based on FACTS would also be discussed. It also aims to equip the attendees with an in-depth understanding of the practical issues related to the control of power systems and an awareness of the advanced modeling, analysis and control techniques applicable to power systems.

DESIRED OUTCOME

The attendees of this course are expected to gain a sound understanding of the characteristics and modeling process of synchronous machines and system loads in power system stability studies, their uses in the design of controllers and development of techniques for assessment and improvement of system performance under steady state, dynamic and transient conditions. The concepts of operation, modeling and control of power electronics-based FACTS devices will also give the attendees an understanding of how FACTS devices enhance power network performance. Case studies will provide the attendees with an insight into the actual application of modeling and control techniques in solving practical issues in power systems. The knowledge gained will also serve as an excellent starting place for graduate students interested in carrying out research in various aspects of power engineering.

OTHER RELEVANT INFORMATION

This course is designed for graduate students and engineers in the electric power industry. It is also intended for engineers who anticipate future involvement in this area. Prior knowledge of power system analysis and control at the undergraduate senior level is expected.

CONTENT

Steady-state Power System Networks. Network Components. Stability Analysis. Power System Control.

ASSESSMENT SCHEME

Continuous Assessment	20%
Final Examination	80%

TEXTBOOKS

1. Kundur P, Power System Stability and Control, McGraw-Hill, New York, 1994.
2. Mathur R M, and Varma R K, Thyristor-Based FACTS Controllers for Electrical Transmission Systems, IEEE Press, Wiley-InterScience, 2002.

REFERENCE

1. Anderson P M, and Fouad A A, Power System Control and Stability, IEEE Press, New York, 1994.