

## **Course Learning Objectives: First Course on Power Systems**

1. Get an overview of the power systems and its changing landscape.
2. Learn about the sources of energy and the environmental consequences.
3. Learn and review the fundamental principles in electric circuit theory that are essential in learning about power system networks.
4. Learn and review the fundamental principals in magnetic theory that are essential in learning about power system apparatus.
5. Learn about transformers and the role they play in power systems.
6. Learn about synchronous generators and the role they play in power systems.
7. Learn about ac transmission lines and cable systems.
8. Learn about HVDC systems.
9. Learn about the characteristics of various power system loads and the power quality issues.
10. Learn how to calculate power flow in a power systems network.
11. Learn about voltage stability and reactive power control in power systems.
12. Learn about rotor-angle transient stability.
13. Learn about control of interconnected power system and economic dispatch.
14. Learn about currents in a faulted power system and protection using relays and circuit breakers.
15. Learn about over-voltages due to lightening and switching surges, protection using surge arresters and the insulation coordination.

**Textbook:** First Course on Power Systems, Ned Mohan, Year 2006,  
[www.MNPERE.com](http://www.MNPERE.com).