

Course Description

This is an introductory course for electric power systems and smart grid. The course includes the following topics: power concepts for ac systems, generation, transmission, distribution, and utilization of electric power, system aspects of synchronous machines, transmission lines, transformers, and motors. Power flow and contingency states. Smart grid concepts, role of information technology in smart grid applications, smart metering, smart buildings and homes.
Prerequisite(s): ELEC 1100 OR PHYS 1114 OR PHYS 1314

List of Topics

Week 1: Structure of the power system, three phase systems
Week 2: Power concepts in ac systems, per unit systems
Week 3: Transformers
Week 4: Synchronous machines
Week 5: Transmission lines
Week 6: Induction motors
Week 7: Power Flow
Week 8: Contingency analysis
Week 9: Smart grid principles
Week 10: Role of Information technology
Week 11: Blackouts and situational awareness

Statement of Objectives/Outcomes:

On successful completion of this course, students will be able to:

CO1 – Obtain a holistic view of smart electric power systems.

CO2 – Recognize and understand the components of smart electric power systems.

CO3 – Design and analyze electric power systems.

Textbook(s):

Duncan Glover, Thomas Overbye, and Mulukutla S. Sama, *Power System Design and Analysis*, sixth edition, Cengage Learning, 2016.

Reference Books/Materials:

M.E. El-Hawary, *Introduction to Electrical Power Systems*, IEEE Press, 2008.

Relationship of Course to Program Outcomes:

Please refer to the Report Section 4.3.2 (iii).

Grading Scheme:

Written Assignment	20%
Mid-term test	40%
Final Examination	40%