香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Department of Electronic & Computer Engineering

ELEC3450 Introduction to Smart Electric Power Systems

Instructor:

Prof. Danny Tsang (eetsang@ece.ust.hk)

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.

Grading policy:

Assignments: 20%

Mid-term Exam: 40%

Final Exam: 40%

Weekly schedule:

Feb 01, 2021	Introduction and basic concepts
Feb 05, 2021	Introduction and basic concepts
Feb 08, 2021	Complex power, three-phase, per phase and per unit system
Feb 09, 2021	Tutorial
Feb 16, 2021	Complex power, three-phase, per phase and per unit system
Feb 19, 2021	Complex power, three-phase, per phase and per unit system
Feb 22, 2021	Transformers and synchronous machines
Feb 23, 2021	Tutorial
Feb 26, 2021	Transformers and synchronous machines
Mar 01, 2021	Transformers and synchronous machines
Mar 02, 2021	Tutorial

Mar 05, 2021	Transmission lines
Mar 08, 2021	Transmission lines
Mar 09, 2021	Tutorial
Mar 12, 2021	Induction motors and power flow analysis I
Mar 15, 2021	Induction motors and power flow analysis I
Mar 16, 2021	Tutorial
Mar 19, 2021	Induction motors and power flow analysis I
Mar 22, 2021	Power flow analysis II
Mar 23, 2021	Tutorial
Mar 26, 2021	Power flow analysis II
Mar 29, 2021	Midterm exam
Mar 30, 2021	Tutorial
Apr 09, 2021	Economic dispatch
Apr 12, 2021	Economic dispatch
Apr 13, 2021	Tutorial
Apr 16, 2021	Economic dispatch
Apr 19, 2021	Electricity market
Apr 20, 2021	Tutorial
Apr 23, 2021	Electricity market
Apr 26, 2021	Electricity market
Apr 27, 2021	Tutorial
Apr 30, 2021	Blackout, contingency and protection
May 03, 2021	Smart grids
May 04, 2021	Tutorial
May 07, 2021	Smart grids
May 20, 2021	Final Exam

Textbook/Reference:

1. “Power system analysis and design”, J. Duncan Glover, Thomas Overbye, Mulukutla S. Sarma, 6th edition (January 7, 2016).

2. "Introduction to electrical power systems", Mohamed E. El- Hawary, Wiley IEEE Press (E-resource is available in the library).

3. http://www.electronics-tutorials.ws (Links to an external site.)