Faculty of Engineering & Technology

Planning of Electrical Networks

Information :

Course Code :	EPR 514	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Specialization of Electrical Power Engineering

Instructor Information :

Title	Name	Office hours
Associate Professor	Mohamed Ezzat Abdel Rahman Abdelghani	14

Area Of Study :

The Main Goals of this course are:
Develop the students' knowledge about power system planning, economy and reliability.
Prepare students to analyze and solve load forecasting and reliability problems.
Train students to conduct a generation planning project.

Description :

Load curves and load characteristics. Load forecasting: Linear and Quadratic Regression, Moving average and Exponential smoothing methods. Cost Analysis of Generation Systems and levelized cost of electrical energy. Distribution network reliability: Reliability Indices; SAIFI, CAIDI, SAIDI, ASAI. Reliability Analysis of Generation Systems: Capacity Outage Probability Table, Binomial Expansion, Recursive Algorithm, Loss of Load Expectation. Course Project.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Define, using proper mathematical formulation, the key factors related to load characteristics.
2 -	Describe the mathematical formulation of different load forecasting techniques.
3 -	Demonstrate the cost components of generation system and the levelized cost of electrical energy.
4 -	Define, using proper mathematical formulation, the distribution system reliability indices including: SAIDI, SAIFI, CAIDI and ASAI.
b.Intellectual Skills: :	
1 -	Apply load forecasting techniques to predict maximum demand and energy consumption during upcoming time horizon.
2 -	Analyze cost components of generation systems
3 -	Evaluate distribution system reliability using SAIDI, SAIFI, CAIDI and ASAI.
4 -	Determine the loss of load expectation trough constructing the capacity outage probability table for a generating system.
c.Professional and Practical Skills: :	
1 -	Select suitable generating unitsôˆnumber and size to achieve a specified level of generation reliability at minimum annual cost of generation.
2 -	Prepare technical reports.

d.General and Transferable Skills: :	
1 -	Communicate effectively.
2 -	Demonstrate efficient IT capabilities

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Load forecasting: Linear and Quadratic Regression, Moving average and Exponential smoothing methods	15	9	6
Cost Analysis of Generation Systems and levelized cost of electrical energy	15	9	6
Distribution network reliability: Reliability Indices; SAIFI, CAIDI, SAIDI, ASAI	15	9	6
Reliability Analysis of Generation Systems: Capacity Outage Probability Table, Binomial Expansion, Recursive Algorithm, Loss of Load Expectation	15	9	6
Load curves and load characteristics	10	6	4
Course Project	5	3	2

Teaching And Learning Methodologies :

Interactive Lecturing.
Problem Solving.
Discussion.
Self-Study.

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Course Project	10.00		
Final exam	40.00		
Mid-Term Exam I	15.00		
Mid-Term Exam II	15.00		
Participation	10.00		
Quizzes	10.00		

Course Notes :

Available at http://shimymb.tripod.com

Recommended books :

1- Roy Billinton, ñReliability Evaluation of Engineering Systems: Concepts and Techniquesò, Springer, Second Edition, 1992.
2- T. Gonen ñElectric Power Distribution Engineeringò, Third Edition, CRC Press, 2014.

Web Sites :
http://shimymb.tripod.com http://dsm.iea.org6.