

Course Number and Title:	EE-315 Power Distribution and Utilization		
Credit Hours:	3+1		
Pre Requisite	Electrical Network Analysis		
Instructor (s):	Dr. Malik Intisar Ali Sajjad		
Lab Engineer:	Engr. Nouman Qamar		
Compulsory/Elective:	Elective		
If Elective: Depth Core/Breadth Core:	Breadth Core		
Course Schedule:	Lecture:	3 hours/week	
	Lab:	3 hours/week	
	Office hours:	5 hours/week	
Course Assessment:	Assignments:	4	
	Quizzes:	3	
	Course project:	1	
	Lab work:	14 experiments	
	Exams:	Mid-semester and final	
Grading Policy:	Quizzes:	10%	
	Assignments:	10%	
	Lab work:	20%	
	Mid-Semester:	20%	
	End-Semester:	40%	
Text Book:	M. L. Anand, "A Text Book of Electrical Power", 2nd Edition.		
Reference Book(s):	1. V.K. Mehta, "Principles of Power Systems", Latest Edition 2. Turan Gonen, "Electrical Power Distribution System", Latest Edition.		
Course Objective:	Students are introduced to the basics of power distribution systems and effective utilization of power in heating and illumination applications.		
Course Learning Outcome	CLO Statement	PLO	Bloom
CLO-1:	Knowledge about the basics of power distribution system	PLO-1	C1
CLO-2:	Use of different techniques and tools for the analysis of distribution system	PLO-2 PLO-5	C2, C4
CLO-3:	To study and analyze different applications related to the utilization of electric power	PLO-1 PLO-2	C1,C2, C4
Topics covered in the course and level of coverage:	❖ Introduction to power distribution System	3 hours	
	❖ Voltage drop and power loss calculations for different type of DC distributors	9 hours	
	❖ Voltage drop and power loss calculations for different type of AC distributors	9 hours	
	❖ Importance of power factor in a distribution system and application of capacitors	6 hours	
	❖ Underground Cables	6 hours	
	❖ Tariffs	3 hours	
	❖ Heating	6 hours	
	❖ Illumination	6 hours	
Program learning outcomes	Detailed Contents	CLO	PLO

and how they are covered by specific course outcomes:	Classification of Distribution Systems, A.C. Distribution, D.C. Distribution, Methods of obtaining 3-wire D.C. System, Overhead versus Underground System, Connection Schemes of Distribution System, Requirements of a Distribution System, Design considerations in Distribution System.	CLO-1 CLO-2	PLO-1 PLO-2 PLO-5
	Types of D.C. Distributors, D.C. Distribution Calculations, D.C. distributor fed at one end (concentrated loading), Uniformly loaded distributor fed at one end, Distributor fed at both ends (concentrated loading), Uniformly loaded distributor fed at both ends, Distributor with both concentrated and uniform loading, Ring Distributor, Ring main distributors with Interconnector	CLO-1 CLO-2	PLO-1 PLO-2 PLO-5
	A.C. Distribution Calculations, Methods of solving A.C. Distribution Problems, 3-phase unbalanced Loads, 4-wire, star-connected unbalanced loads, Ground detectors.	CLO-1 CLO-2	PLO-1
	Power Factor , Power Triangle, Disadvantages of Low Factor, Causes of Low Power Factor, Power Factor Improvement, Power Factor Improvement Equipment, Calculations of Power Factor Correction, Importance of Power Factor improvement, Most Economical Power Factor	CLO-1 CLO-2	PLO-1
	Underground Cables, Construction of Cables, Insulating Materials for Cables, Classification of Cables, Cables for 3-Phase Service, Laying of Underground Cables, Insulation Core Cable, Dielectric Stress in a Single Core Cable, Most Economical Conductor Size in a Cable, Grading of Cables, Capacitance of 3-Core Cables, Current carrying capacity of underground cables, Thermal resistance of dielectric of single-core cable, Permissible current loading, Types of cable faults, Loop tests for location of faults in underground cables, Murray loop test, Varley loop test	CLO-1 CLO-2	PLO-1 PLO-2 PLO-5
	Tariff, Desirable characteristics of a Tariff, Types of Tariff.	CLO-1	PLO-1
	Introduction to heating, Classification of methods for electric heating, Requirements of a good heating material, Design of heating element, Temperature control of resistance furnace, Electric arc furnace, Induction heating, Dielectric heating, Electric Welding, Resistance welding, Electric arc welding	CLO-1 CLO-3	PLO-1 PLO-2
	Introduction to illumination, The nature of radiation, Polar curve, Law of illumination, Luminous efficiency, Photometry, Lumen/flux method of calculations, The electric lamp, Flood lighting and calculations, Street lighting Design of choke and capacitor	CLO-1 CLO-3	PLO-1 PLO-2

Mapping of CLOs with PLOs and Bloom's Taxonomy Cognitive Levels:

PLO	1	2	3	4	5	6	7	8	9	10	11	12
CLO-1	C1											
CLO-2		C2			C4							
CLO-3	C1,C2	C4										

Mapping of CLOs with Assessment Methods:

CLOs/Assessment	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
Assignments:	√	√	√		
Quizzes:	√	√	√		
Lab work:	√	√	√		
Mid-Semester:	√	√			
End-Semester:	√	√	√		