22EEHO107	POWER SYSTEM PLANNING AND RELIABILITY	SEMESTER				
PREREQUISTIES		**CATEGORY**	**PEC**	**Credit**		**3**
Power Systems		**Horus/Week**	**L**	**T**	**P**	**TH**
			3	**0**	**0**	**3**

Course Objectives:

1.	Understand the concepts of power system planning
2.	Analyze power system reliability
3.	Understand generation, transmission and distribution planning and reliability

UNIT I	**INTRODUCTION**	**9**	**0**	**0**	**9**

Introduction, Objectives & Factors affecting to System Planning , Short Term Planning, Medium Term Planning, Long Term Planning, Reactive Power Planning.

UNIT II	**RELIABILITY**	**9**	**0**	**0**	**9**

Reliability, Failure, Concepts of Probability, Evaluation Techniques (i) Markov Process (ii) Recursive Technique, Stochastic Prediction of Frequency and Duration of Long & Short Interruption, Adequacy of Reliability, Reliability Cost.

UNIT III	**GENERATION PLANNING AND RELIABILITY**	**9**	**0**	**0**	**9**

Generation Sources, Integrated Resource Planning, Generation System Model, Loss of Load (Calculation and Approaches),Outage Rate, Capacity Expansion, Scheduled Outage, Loss of Energy, Evaluation Methods, Interconnected System, Factors Affecting Interconnection under Emergency Assistance.

UNIT IV	**TRANSMISSION PLANNING AND RELIABILITY**	**9**	**0**	**0**	**9**

Introduction, Objectives of Transmission Planning, Network Reconfiguration, System and Load Point Indices, Data required for Composite System Reliability.

UNIT V	**DISTRIBUTION PLANNING AND RELIABILITY**	**9**	**0**	**0**	**9**

Radial Networks, Network Reconfiguration, Evaluation Techniques, Interruption Indices, Effects of Lateral Distribution Protection, Effects of Disconnects, Effects of Protection Failure, Effects of Transferring Loads, Distribution Reliability Indices, Parallel & Meshed Networks, Bus Bar Failure, Scheduled Maintenance, Temporary and Transient Failure, Breaker Failure.

Total (45L+0T)= 45 Periods

Text Books:

1.	R.L. Sullivan "Power System Planning", Tata McGraw Hill Publishing Company Ltd.
2.	Roy Billinton & Ronald N. Allan "Reliability Evaluation of Power System", Springer Publication
3.	T. W. Berrie "Electricity Economics & Planning", Peter Peregrinus Ltd., London.

Reference Books:

1.	Ali Chowdhury, Don Koval, "Power Distribution System Reliability: Practical Methods and Applications", Wiley-IEEE Press, 2009.
2.	Roy Billinton, R.N. Allan, "Reliability Evaluation of Power Systems", Springer, 1996.

E-Reference

1	https://archive.nptel.ac.in/courses/117/103/117103149/

Course Outcomes: Upon completion of this course, the students will be able to:			**Bloom's Taxonomy Mapped**
CO1	:	To understand the power system planning	L2: Understanding
CO2	:	To determine the reliability of power system	L1: Applying
CO3	:	to understand the generation planning and reliability of power system	L1: Remembering
CO4	:	to understand the transmission planning and reliability of power system	L2: Understanding
CO5	:	to understand the distribution planning and reliability of power system	L1: Remembering

COURSE ARTICULATION MATRIX															
COs/ POs	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS O2**	**PS O3**
CO1	1	1	1	1	1	1	1	1			1		1	1	1
CO2	1	3	3	3	2	1	2	1	1		1		1	1	1
CO3	1	2	2	3	2	1	2	1	1		1		1	1	1
CO4	1	3	2	3	2	1	2	1	1		1		1	1	1
CO5	1	2	3	3	2	1	2	1	1		1		1	1	1
Avg	1	2.2	2.2	2.6	1.8	1	1.8	1	1	0	1	0	1	1	1
3/2/1-indicates strength of correlation (3- High, 2-Medium, 1- Low)															