

M.E Semester: 3
Electrical Engineering
Subject Name: Power System Planning and Reliability (Major Elective-III)

A. Course Objective:

- To understand deeply about generation and transmission reliability..
- To study about distribution system planning and reliability.

B. Teaching / Examination Scheme

SUBJECT		Teaching Scheme				Total Credit	Examination Scheme					Total Marks
		L	T	P	Total		THEORY		IE	CIA	PR. / VIVO	
		Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
MEEPS-302B	Power System Planning and Reliability	4	0	2	6	5	3	70	30	20	30	150

C. Detailed Syllabus

SR No.	Topic	No. of Hours	Weightage in % in Exam
Unit-1	Load forecasting & Reliability: Classification and characteristics of loads. Approaches to load forecasting. Forecasting methodology. Energy forecasting. Basic Reliability Concepts: General reliability function, Markov Chains and processes and their applications, simple series and parallel system models. load forecasting uncertainty, Spinning Generating Capacity Reliability Evaluation: Spinning capacity evaluation,	16	30%
Unit-2	Genration System Reliability analysis: Probabilistic generation and load models- Determination of LOLP and expected value of demand not served Determination of reliability of iso and interconnected generation systems	08	15%

Unit-3	Transmission System Reliability Analysis: Deterministic contingency analysis, Average interruption rate method. The frequency and duration method, Stormy and normal weather effects probabilistic load flow-Fuzzy load flow probabilistic transmission system reliability analysis- Determination of reliability indices like LOLP and expected value of demand not served. Interconnected Systems Generating Capacity Reliability Evaluation, The loss of load approach. Reliability evaluation in two and more than two interconnected systems. Interconnection benefits.	16	30%
Unit-4	Expansion Planning: Basic concepts on expansion planning-procedure followed for integrate transmission system planning. current practice in India-Capacitor placer problem in transmission system and radial distributions system.	12	15%
Unit-5	Distribution System Planning Overview: Introduction, sub transmission lines and distribution substations-Design primary and secondary systems, Distribution system protection and coordination of protective devices. Parallel & Meshed Networks, Basic Evaluation Techniques, Bus Bar Failure, Scheduled Maintenance, Temporary and Transient Failure, Weather Effects, Breaker Failure.	8	10%

D. Instructional Method & Pedagogy

- At the start of course, the course delivery pattern , prerequisite of the subject will be discussed
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal weightage should be given to all topics while teaching and conduction of all examinations.
- Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
- One/Two internal exams may be conducted and total/average/best of the same may be converted to equivalent of 30 marks as a part of internal theory evaluation.
- Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of ten marks in the overall internal evaluation.
- Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation.

E. Students Learning Outcome:

- On successful completion of the course, the student can learn about power system transmission and distribution planning as well as reliability.

F. Suggested Reading:

1. R.L .Sullivan, “ Power System Planning”, Tata Mcgraw hill.
2. Roy Billinton and Allan Ronald, “Power System Reliability.”
3. Turan Gonen, Electric power distribution system Engineering ‘McGraw Hill, 1986
4. Modern Power System Planning . X. Wang and J.R. McDonald, McGraw Hill
5. Electrical Power Distribution A.S. Pabla, Tata McGraw Hill.

