



# Kadi Sarva Vishwavidyalaya

**Faculty of Engineering & Technology**  
**Second Year Master of Engineering (EE) – Semester III**  
 (With effect from: Academic Year 2018-19)

**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	
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
MEEE-302-N-B	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	<p><b>Load forecasting &amp; Reliability:</b> 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,</p>	16	30%
Unit-2	<p><b>Genration System Reliability analysis:</b> Probabilistic generation and load models- Determination of LOLP and expected value of demand not served</p> <p>Determination of reliability of iso and interconnected generation systems</p>	08	15%
Unit-3	<p><b>Transmission System Reliability Analysis:</b> 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.</p> <p>Interconnected Systems Generating Capacity Reliability Evaluation, The loss of load approach. Reliability evaluation in two and more than two interconnected systems. Interconnection benefits.</p>	16	30%
Unit-4	<p><b>Expansion Planning:</b> Basic concepts on expansion planning-procedure followed for integrate transmission system planning.</p> <p>current practice in India-Capacitor placer problem in transmission system and radial distributions system.</p>	12	15%

<b>Unit-5</b>	<p><b>Distribution System Planning Overview:</b> Introduction, sub transmission lines and distribution substations-Design primary and secondary systems, Distribution system protection and coordination of protective devices.</p> <p>Parallel &amp; Meshed Networks, Basic Evaluation Techniques, Bus Bar Failure, Scheduled Maintenance, Temporary and Transient Failure, Weather Effects, Breaker Failure.</p>	8	10%
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**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.