

# Kadi Sarva Vishwavidyalaya Faculty of Engineering & Technology Master of Engineering Semester III (Electrical Power System) (With effect from: Academic Year 2018-19)

Subject Code: MEEE302-N-B	Subject Title: Power System Planning and Reliability
	(Major Elective)
Pre-requisite	

### 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	Examination Scheme					Total	
		L	Т	Р	Total	Credit	THEORY		IE	CIA	PR. /	
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
MEEE302- N-B	Power System Planning and Reliability	4	0	2	6	5	3	70	30	20	30	150

## C. Detailed Syllabus

SR No.	Торіс	No. of Hours	Weighta ge 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	<b>Genration System Reliability analysis</b> : 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	<ul> <li>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.</li> <li>Interconnected Systems Generating Capacity Reliability Evaluation, The loss of load approach. Reliability evaluation in two and more than two interconnected systems. Interconnection benefits.</li> </ul>	16	30%
Unit-4	<b>Expansion Planning:</b> 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	<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. 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.