

Course Syllabi: UEE843 Power System Planning (L : T : P :: 3 : 1 : 0)

1. **Course number and name:** UEE843; Power System Planning

2. **Credits and contact hours:** Credits: 3.5; Hours: 4

3. **Text book, title, author, and year**

- *Dasari, S., Electric Power System Planning, IBT Publishers (1999).*
- *Pabla, A.S., Electric Power Distribution, Tata McGraw–Hill (2008).*
- *Sullivan, R., Power System Planning, McGraw–Hill (1977).*
- *Knight, U.G., Power System Engineering and Mathematics, Pergamon Press (1972).*
- *McDonald, J.R., Modern Power System Planning, McGraw–Hill (2007).*

a. Other supplemental materials

- Nil

4. **Specific course information**

a. Brief description of the content of the course (catalog description)

Introduction: Power system planning, Objective, Stages in planning and design, Transition from planning to operation.

Generating System capability Planning: Probabilistic models of generating units, Growth rate, Rate of generation capacity, Outage performance and system evaluation of loss of load and loss of energy indices, Power supply availability assessment.

Interconnected Systems: Multi area reliability analysis, Power pool operation and power exchange energy contracts, Quantification of economic and reliability benefits of pool operation.

Demand/ Energy forecasting: Electricity consumption pattern, Peak demand and energy forecasting by trend and economic projection methods.

Power System expansion planning: Formulation of least cost optimization problem involving capital, Operation and maintenance costs of candidate units of different types.

Design of Distribution Systems: Introduction, Optimal conductor selection, Capacitor placement, Reconfiguration, Substation planning.

5. **Specific goals for the course**

After the completion of the course, the students will be able to:

- Assess the generation adequacy in power system using probabilistic approach
- Analyse the configuration of substations and power pools
- Evaluate the peak demand and energy requirements of system using forecasting techniques.
- Develop the solution methodology for optimising the cost of power system under operation.

6. **Brief list of topics to be covered**

- Generating System capability Planning
- Interconnected Systems
- Demand/ Energy forecasting
- Power System expansion planning
- Design of Distribution Systems