RESTRUCTURED POWER SYSTEMS

Course Code: 15EE2108

L	P	C
3	0	3

Course Outcomes:

At the end of the course, the student will be able to:

CO1: Understand the need for restructuring of Power Systems, discuss different market models, different stakeholders and market power

CO2: Understand and generalize the functioning and planning activities of ISO.

CO3: Understand transmission open access pricing issues and congestion management.

CO4: Define transfer capability and estimate the transfer capability of a small power systems. (Numerical examples)

CO5: Define ancillary services and understand reactive power as ancillary service and management through synchronous generator.

UNIT I (10-Lectures)

Deregulation of the Electricity Supply Industry

Introduction – What is Deregulation?; Deregulation Vs Restructuring; Restructuring Models; Key Stakeholders in Restructured Power System – Independent System Operator, Power Exchange, Load Serving Entities; Market Operations – Day ahead and Hour ahead markets, elastic and non-elastic markets; Market Power; Benefits from Competitive Electricity Markets.

UNIT II (10-Lectures)

Power System Operation in Competitive Environment

Introduction; Role of the Independent System Operator; Operational planning activities of ISO – in pool and bilateral markets; Operational planning activities of ISO - in pool and bilateral markets; Market

participation issues; Unit Commitment in Deregulated Environment; Competitive Bidding.

UNIT III (10-Lectures)

Transmission Open Access, Pricing Issues and Congestion Management:

Introduction; Power Wheeling; Transmission Open Access – Types of Transmission services, cost components; Pricing of Power Transactions – Embedded Cost Based Transmission Pricing, Incremental Cost Based Pricing; Congestion Pricing –Congestion Pricing Methods, Transmission Rights; Management of Inter-zonal/Intra-zonal congestion.

UNIT IV (10-Lectures)

Transfer Capability

Definitions, Transfer Capability issues, ATC Calculation, TTC Calculation, TRM Calculation, CBM Calculation; Methodologies to calculate ATC.

UNIT V (10-Lectures)

Ancillary Services Management

General description of some ancillary services; Ancillary Services Management in various countries; Reactive Power as an Ancillary Service

TEXT BOOKS:

1. Kankar Bhattacharya, Math H.J. Boller, JaapE. Daalder, '*Operation of Restructured Power System*' Klumer Academic Publisher – 2001.
2. Mohammad Shahidehpour, and Muwaffaqalomoush, - "*Restructured electrical Power systems*" Marcel Dekker, Inc. 2001.

REFERENCES:

1. Loi Lei Lai; "*Power system Restructuring and Deregulation*", John Wiley & Sons Ltd., England.
2. http://nptel.iitm.ac.in.