SRM UNIVERSITY
(Under section 3 of UGC Act 1956)

LESSON PLAN

CLASS : II semester M.Tech (Power Systems)

SUBJECT : PS2006 - Deregulation of Power System

Staff in-charge : Dr. K.Vijayakumar

Purpose :

- To Introduce the restructuring of power industry and market models.
- To impart knowledge on fundamental concepts of congestion management.
- To analyze the concepts of locational marginal pricing and financial transmission rights.
- To Illustrate about various power sectors in India

S.NO	TOPIC	Hours required	Cumulative hours	Reference Books
1	UNIT-I Introduction: Deregulation of power industry	1	1	R1,R2
2	Restructuring process and Issues involved in deregulation	1	2	R1,R2
3	Deregulation of various power systems	1	3	R1,R2
4	Fundamentals of Economics: Consumer behavior, Supplier behavior, Market equilibrium,	1	4	R1,R4
5	Short and long run costs, Various costs of production	2	6	R1,R2
6	Market models: Market models based on Contractual arrangements	2	8	R1,R4
7	Comparison of various market models	2	10	R1,R4
8	Electricity vis – a – vis other commodities	1	11	R1
9	Market architecture - Case study.	1	12	R1,R4
10	UNIT-II Introduction: Definition of Congestion, reasons for transfer capability limitation	1	13	R1
11	Importance of congestion management, Features of congestion management	1	14	R1
12	Classification of congestion management methods	2	16	R1
13	Calculation of ATC - Non – market methods – Market methods	2	18	R1,R2
14	Nodal pricing	2	20	R1
15	Inter zonal and Intra zonal congestion management	2	22	R1
16	Price area congestion management	1	23	R1
17	Capacity alleviation method.	1	24	R1

18	UNIT- III Mathematical preliminaries: Locational marginal pricing	1	25	R1
19	Lossless DCOPF model for LMP calculation	1	26	R1
20	Loss compensated DCOPF model for LMP calculation	1	27	R1
21	ACOPF model for LMP calculation	1	28	R1
22	Financial Transmission rights	1	29	R1,R2
23	Risk hedging functionality - Simultaneous feasibility test and revenue adequacy	1	30	R1
24	FTR issuance process: FTR auction, FTR allocation	1	31	R1
25	Treatment of revenue shortfall	1	32	R1
26	Secondary trading of FTRs	1	33	R1
27	Flow gate rights	1	34	R1
28	FTR and market power	1	35	R1
29	FTR and merchant transmission investment	1	36	R1
30	UNIT-IV Introduction of ancillary services - Types of Ancillary services	1	37	R1,R2
31	Classification of Ancillary services	1	38	R1,R2
32	Load generation balancing related services	1	39	R1
33	Voltage control and reactive power support devices	1	40	R1
34	Black start capability service	1	41	R1
35	ancillary service –Co-optimization of energy and reserve services	1	42	R1
36	International comparison - Transmission pricing – Principles	1	43	R1
37	Classification – Role in transmission pricing methods	2	45	R1,R2
38	Marginal transmission pricing paradigm	1	46	R1
39	Composite pricing paradigm	1	47	R1
40	Merits and demerits of different paradigm.	1	48	R1
41	UNIT-V Introduction – Framework of Indian power sector	2	50	R1,R4
42	Reform initiatives	2	52	R1,R4
43	Availability based tariff	2	54	R1
44	Electricity act 2003	2	56	R1
45	Open access issues	2	58	R1
46	Power exchange	1	59	R1
47	Reforms in the near future	1	60	R1,R4

REFERENCE BOOKS

1. Mohammad Shahidehpour, Muwaffaq Alomoush, Marcel Dekker, “Restructured electrical power systems: operation, trading and volatility” Pub., 2001.

2. Kankar Bhattacharya, Jaap E. Daadler, Math H.J. Boolen, “Operation of restructured power systems”, Kluwer Academic Pub., 2001.
3. Sally Hunt, “Making competition work in electricity”, John Willey and Sons Inc. 2002.
4. Steven Stoft, “Power system economics: designing markets for electricity”, John Wiley & Sons, 2002.