

**(ELECTIVE – C/II)****4/4 B.Tech. SEVENTH SEMESTER  
POWER SYSTEM DEREGULATION****EE7T6C****Credits:3****Lecture: 3 periods/week****Internal assessment: 30 marks****Tutorial: 1 period /week****Semester end examination: 70 marks****Course Objective:**

The aim of this course is to impart knowledge on fundamental concepts of deregulated electrical market systems, power business and technical issues involved in a restructured power system of both Indian and world scenario

**Course Outcomes:**

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

1. Understand the developments in restructuring of power systems
2. Explore issues like congestion management, transmission pricing, ancillary services management.
3. Analyze the concepts of locational marginal pricing and financial transmission rights.
4. Understand typical issues in electricity markets and how these are handled world-wide in various markets

**UNIT I**

**Need and conditions for deregulation:** Introduction of market structure, market architecture, spot market, forward markets and settlements. Review on concepts of marginal cost of generation, least-cost operation, incremental cost of generation. Comparison between old and new power system operation

**UNIT II**

**Electricity sector structures and ownership /management:** The forms of ownership and management. Different structure models like monopoly model, purchasing agency model, wholesale competition model, retail competition model.

**UNIT III**

**Locational marginal pricing:** Framework and methods for the analysis of Bilateral and pool markets, LMP based markets, auction models and price formation, price based unit commitment.

**UNIT IV**

**Transmission network and market power:** Power wheeling transactions and marginal costing, transmission costing. Congestion management methods- market splitting, counter-trading, effect of congestion on LMPs.

**UNIT V**

**Ancillary Services and System Security in Deregulation:** Classifications and definitions, ancillary services management in various markets, regulatory issues involved in the deregulation of the power industry.

## Learning Resources

### Reference Books:

1. Power System Economics: Designing markets for electricity by S. Stoft, John Wiley & Sons Inc Publishers, 2002
2. Operation of restructured power systems by K. Bhattacharya, M.H.J. Bollen and J.E. Daalder, Kluwer academic publishers, 2001
3. Market operations in electric power systems by M. Shahidehpour, H. Yamin and Z. Li John Wiley & Sons Inc Publishers, 2002
4. Fundamentals of power system economics by S. Kirschen and G. Strbac John Wiley & Sons, Ltd