

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme		Master of Technology				Branch/Spec.		Electrical (Electrical Power System)	
Semester		II				Version		1.0.0.1	
Effective from Academic Year			2025-2026			Effective for the batch Admitted in			July 2025
Course Code		3EE21PE1		Course Name		Restructured Power Systems			
Teaching scheme						Examination scheme (Marks)			
(Per week)		Lecture(DT)		Practical(Lab.)		Total			
		L	TU	P	TW			CE	SEE
Credit		3	0	1	0	4	Theory	40	60
Hours		3	0	2	0	5	Practical	30	20
Pre-requisites:									
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Course Outcomes									
On successful completion of the subject, students should be able to:									
CO1	Understand deregulation and market models in restructured power systems.								
CO2	Apply optimal power flow and pricing concepts in electricity markets.								
CO3	Analyze bidding, risk, transmission, and congestion in deregulated systems.								
CO4	Evaluate ancillary services and global trends in power market restructuring.								
Theory syllabus									
Unit	Content								Hrs
1	Deregulation: Fundamentals of restructured system, Current situation around the world, Benefits from a competitive electricity market, Role of the independent system operator, Operational planning activities of ISO.								08
2	Philosophy of Market Model: Market equilibrium, Load elasticity, Perfectly competitive market, Comparison of market models, Social welfare maximization, Pillars of market design, Standard market design.								08
3	Optimal Power Flow: Role of OPF in VIU and restructured markets., Locational marginal cost, LMP for ACOPF, LMP for DCOPF,								06
4	Basic Issues of the Restructured Power system: Optimal bidding, Risk assessment, Hedging, Tracing of power, Transmission planning, Transmission pricing, Transmission pricing model in India, Availability based tariff, Congestion management, Classification of congestion management.								09
5	Ancillary Service Management Ancillary services for restructuring, Classification of ancillary services, Ancillary services management in various countries, Reactive power management in deregulated electricity markets.								07
6	Global Restructured Power Systems: Global experience with electricity reforms in different countries, PJM, Towards standard market Design, Recent trends in restructuring, Developments in India, Distributed generation in the restructured market, IT applications in restructured markets.								07
Practical content									
Practicals, assignments, and tutorials are based on the above syllabus.									
Text Books									
1.	Mohammad Shahidehpour, Muwaffaq Alomoush, "Restructured electrical power systems: operation, trading and volatility," Marcel Dekker.								
2.	K. Bhattacharya, MHT Bollen, and J.C Doolder, "Operation of Restructured Power Systems," Kluwer Academic Publishers, USA.								
Reference Books									
1.	Lorrin Philipson, H. Lee Willis, "Understanding electric utilities and de-regulation," Marcel Dekker Pub.								
2.	Steven Stoft, "Power system economics: designing markets for electricity," John Wiley and Sons.								
3.	Sally Hunt, "Making Competition Work in Electricity," John Wiley Inc.								
4.	Lei Lee Lai, "Power System restructuring and de-regulation," John Wiley and Sons, UK.								

5.	Edward Kahn “Electric Utility Planning and Regulation,” American Council for Energy-Efficient Economy
6.	Fred I Denny and David E. Dismukes, “Power System Operations and Electricity Markets,” CRC Press.
7.	Central Electricity Regulatory Commission, Regulations and Orders - www.cercind.org
8.	Electricity Act 2003 and National Policies – www.powermin.nic.in .
ICT/MOOCs	
1.	https://nptel.ac.in/courses/108/101/108101005/

Mapping of CO with PO and PSO:															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	2	1	2	2	1	1	1	1	3	2	1	2
CO2	3	3	2	2	2	2	1	0	2	1	2	2	1	1	1
CO3	2	3	2	3	1	2	1	0	1	1	1	2	2	1	2
CO4	3	2	2	2	2	1	1	0	1	1	1	2	2	1	1