

IF553: Electrical System in Infrastructure Engineering

Teaching and Examination Scheme:

CREDITS = 5 (L=3, T=2, P=0)

M. Tech First year, 1st Semester

Teaching and Assessment Scheme:

Teaching Scheme			Credits	Assessment Scheme				
L	T	P		Theory		Practical		Total Marks
			ESE	CE	ESE	CE		
3	2	0	5	70	30	30	20	150

Course Contents:

Unit No.	Topics	Teaching Hours
1	General overview of electricity demand and supply: AC and DC supply, Energy requirement and consumption in building, Electrical load calculations for home appliances.	06
2	Electrical wiring: Single phase & Three phase.	04
3	Structure and operation of Modern Power System: Introduction to generation, transmission and distribution systems, Technical and commercial aspects. Infrastructure requirements of various generating stations & sub-stations. Layout of substations, distribution systems & underground cable distribution.	10
4	Energy conservation code for building: Lighting General, Mandatory requirements of lighting control, exit signs, exterior building grounds lighting, Perspective requirements of interior lighting power, building area method, space function method, installed interior lighting power, exterior lighting power.	08
5	Energy conservation code for building: Electrical Power General, Mandatory requirements of transformers, energy-efficient motors, power factor correction, check-metering and monitoring, power distribution systems.	08

List of References:

1. A. J. Wood and B.F. Wollenberg, "*Power Generation Operation and Control*", Wiley India Edition, Second Edition, (2003)
2. D. P. Kothari and I.J. Nagrath, "*Modern Power System Analysis*", Tata McGraw-Hill, Third Edition, (2003)
3. Surjit Singh, "*Electrical Estimating & costing*", Dhanpat Rai & Co.
4. S.G. Tarnekar, "*A Textbook of Laboratory Course in Electrical Engineering*", S. Chand Publications.
5. "*Energy conservation building code – User Guide*", Bureau of Energy Efficiency, July 2009.
6. N. Jenkins, J.B. Ekanayake, G. Strbac, "*Distributed Generation*", IET, Renewable Energy Series, 2010
7. Gilbert M. Masters, "*Renewable and Efficient Electric Power Systems*", Wiley, 2004.
8. J. J. Grainger and W.D. Stevenson Jr., "*Power System Analysis*", Tata McGraw-Hill, (1994)