22EEHO102	SEMES	TER			
PREREQUISI	PEC	Credit		3	
Dayyar Systam	Hours/Week	L	T	P	TH
Power System	Hours/ week	3	0	0	3
Course Objecti	ves:				
	knowledge on energy management system.				
2. To unders	tand network analysis function of EMS.				
	he function and control of SCADA.				
4. To analyz	e the concept of SCADA hardware and software.				
5. To study	he concept of power system automation using SCADA.				
UNIT I E	IERGY MANAGEMENT SYSTEM	9	0	0	9
Introduction	o EMS, Objectives, Evolution of EMS, Evolution o	f SCAI	DΑ,	Fun	ction
and Benefits of	f EMS, EMS Architecture, Practical EMS, Working of EMS, 1	Power Sy	stem	Sec	urity:
Introduction, S	tatic Security Assessment, Operating states of Power System.	Real Ti	me o	or C	nline
Application: Co	ntrol Function, Protection Function, Operating States of Power System				
UNIT II N	TWORK ANALYSIS FUNCTION OF EMS	9	Δ.	Δ.	Δ.
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	tion, Extended Real Time Function, State Estimation: Introduction, Con			"	1 -
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Real Time Fund Linear		nventional	State	Esti	matio
Real Time Fund Linear state estimation. Economic Dispa	tion, Extended Real Time Function, State Estimation: Introduction, Con Economic Dispatch and Optimal Power Flow: Introduction, Economic D tch Problem, Optimal Power Flow problem Formulation.	nventional	State	Esti	matio
Real Time Functional Linear state estimation. Economic Disparence UNIT III SO	tion, Extended Real Time Function, State Estimation: Introduction, Con Economic Dispatch and Optimal Power Flow: Introduction, Economic D tch Problem, Optimal Power Flow problem Formulation.	rispatch, G	State Genera	Esti	matio
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Text Books:										
1.	Wayne C. Turner, Steve Doty, Energy Management Hand book, The Fairmont Press, 6 th Edition, 2007.									
2.	Handschin, E. "Energy Management Systems", Springer Verlag, 1990.									
3.	Mini S. Thomas, John D McDonald, "Power System SCADA and Smart Grids", CRC Press, 2015.									
Reference Books:										
1.	John D Mc Donald, "Electric Power Substation Engineering", , CRC press, 2001									
2.	Handschin, E, "Real Time Control of Electric Power Systems", Elsevier, 1972.									
E-References:										
1.	NPTEL Online Courses, Energy Management Systems and SCADA, IIT Madras. Link:									
1.	"https://nptel.ac.in/courses/108106022/12"									

Course O	Bloom's Taxonomy				
Upon con	Mapped				
CO1	:	Explore the objectives of EMS.	L2: Understanding		
CO2	:	Understand the real time function of EMS.	L1: Remembering		
CO3	:	Explain the real time monitoring and control of SCADA.	L4: Analyzing		
CO4	:	Analyze the hardware and software functions of SCADA.	L4: Analyzing		
CO5	:	Outline the power system automation and protection using SCADA.	L2: Understanding		

COURSE ARTICULATION MATRIX															
COs/ POs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO1	3	1						1					2		3
CO2	3		2			2							2		3
CO3	3		2										2		3
CO4	3		2										2		3
CO5	3		2										2		3
Avg	3	1	2	0	0	2	0	1	0	0	0	0	2	0	3
3/2/1-indicates strength of correlation (3- High, 2-Medium, 1- Low)															