



SWARNANDHRA COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous)

Accredited by NBA, AICTE, NEW DELHI • Accredited by NAAC with "A" Grade – 3.32/4.00 CGPA

Recognized by UGC Under Sections 2(f) & 12 (B) of UGC Act 1956

Approved by AICTE, New Delhi, Permanent Affiliated to JNTU K, Kakinada

Seetharampuram, NARSAPUR-534 280, W.G-Dist., Andhra Pradesh

Department of Electrical & Electronics Engineering

TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods/ Week	Academic Year	Date of Commencement of Semester
20EE7E03	FLEXIBLE ALTERNATING CURRENT TRANSMISSION SYSTEMS	VII	EEE	6	2025-26	09-06-2025

Course Outcomes: After successful completion of this course, students should be able to:

1	Know the concepts of facts controller and power flow control in transmission line.
2	Demonstrate operation and control of voltage source converter and know the concepts current source converter
3	Analyze compensation by using different compensators to improve stability and reduce power oscillations in the transmission lines.
4	Know the concepts methods of compensations using series compensators.
5	Analyze operation of Unified Power Flow Controller and Interline power flow controller

Unit	Outcome/Bloom's Level	Topics No.	Topics/ Activity	Text Book/ Reference	Cont act Hou r	Delivery Method
I	Know the concepts of facts controller and power flow control in transmission line.	1.1	Overview of FACTS	T1,R1	1	Chalk and Board
		1.2	UNIT-I : Introduction to FACTS Power flow in an AC system	T1,R1	1	Chalk and Board, PPT
		1.3	Loading capability limits	T1,R1	1	Chalk and Board, PPT
		1.4	Dynamic stability considerations	T1,R1	1	Chalk and Board, PPT
		1.5	Importance of controllable parameters	T1,R1	2	Chalk and Board, PPT
		1.6	Basic types of FACTS controllers	T1,R1	2	Chalk and Board, PPT
		1.7	Benefits from FACTS controllers	T1,R1	2	Chalk and Board, PPT
		1.8	Requirements of FACTS Devices	T1,R1	1	Chalk and Board, PPT
		1.9	characteristics of high power devices	T1,R1	1	Chalk and Board, PPT
Total					12	
II	Demonstrate operation	2.1	UNIT-II : Voltage source	T1, R1	1	Chalk and



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	and control of voltage source converter and know the concepts current source converter		and Current source converters Voltage source converter (VSC)			Board
		2.2	Single phase full-wave bridge converter	T1, R1	1	Chalk and Board
		2.3	Square wave voltage harmonics for a single-phase bridge converter – Three-phase full-wave bridge converter	T1, R1	2	Chalk and Board
		2.4	Transformer connections for 12 pulse operation.	T1, R1	2	Chalk and Board
		2.5	Current Source Converter (CSC)-Three-phase current source converter	T1, R1	1	Chalk and Board, PPT
		2.6	Comparison of current source converter with voltage source converter	T1, R1	1	Chalk and Board, PPT
		Total			08	
III	Classify between classical and fuzzy sets	3.1	UNIT-III : Shunt Compensators And Variable Impedance Type VAR Generator Shunt Compensators Objectives – Mid-point voltage regulation for line segmentation	T1,R1	1	Chalk and Board
		3.2	End of line voltage support to prevent voltage instability	T1,R1	2	Chalk and Board
		3.3	Improvement of transient stability	T1,R1	1	Chalk and Board
		3.4	Power oscillation damping.	T1,R1	1	Chalk and Board
		3.5	Variable Impedance Type VAR Generator Thyristor Switched/Controlled Reactor (TSR/TCR)	T1,R1	2	Chalk and Board
		3.6	Thyristor Switched Capacitor (TSC)	T1,R1	1	Chalk and Board
		3.7	Fixed Capacitor– Thyristor Controlled Reactor (FC-TCR)	T1,R1	1	Chalk and Board
		3.8	Thyristor Switched Capacitor and Thyristor Controlled Reactor (TSC–TCR) -	T1,R1	2	Chalk and Board



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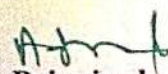
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S. No.	Authors, Book Title, Edition, Publisher, Year of Publication
1	N.G.Hingorani and L.Guygi, "Understanding FACTS" IEEE Press.Indian Edition Standard Publications, 2001.
2	Sang.Y.H and John.A.T, "Flexible AC Transmission systems" IEEE Press 2006
3	Vijay K.Sood , "HVDC & FACTS Controllers: applications of static converters in power systems" Springer publishers

Reference Books:

S. No	Authors, Book Title, Edition, Publisher, Year of Publication
1	"Flexible ac transmission system (FACTS)" Edited by Yong Hue Song and Allan T Johns, Institution of Electrical Engineers, London.
2	Mohan Mathur and Rajiv K.Varma, "Thyristor-based FACTS Controllers for Electrical Transmission Systems" by RWiley.

		Name	Signature
i.	Course Coordinator	Mrs.N.Lavanya	N.L.
ii.	Module Coordinator	Dr V Madhu	Dr V Madhu
iii.	Programme Coordinator	Dr A Satyanarayana	Dr A Satyanarayana


Principal