



# 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 and Electronics Engineering

### TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods/Week	Academic Year	Date of Commencement of Semester
20EE3T01	ELECTRICAL CIRCUITS & SYNTHESIS	III	EEE	6	2021-2022	6/11/21

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

1	Solve the Three Phase Circuits under Balanced & Unbalanced Conditions.(K3)
2	Illustrate the Transient Response of Electrical Circuits for DC Excitations.(K2)
3	Illustrate the Transient Response of Electrical Circuits for AC Excitations.(K2)
4	Design different kinds of two port networks filter circuits.(K6)
5	Define network functions and synthesize networks using Foster and Cauer forms.(K1)

Unit	Outcome/ Bloom's Level	Topics No.	Topics/ Activity	Text Book/ Reference	Contact Hour	Delivery Method/ LMS
I	CO1: Solve the Three Phase Circuits under Balanced & Unbalanced Conditions/( K3 )	1.1	Introduction	T1,T2.R3	1	PPT, Chalk & Talk, & Tutorial
		1.2	Phase Sequence	T1,T2.R3	1	PPT, Chalk & Talk, & Tutorial
		1.3	Star and delta connection	T1,T2.R3	1	PPT, Chalk & Talk, & Tutorial
		1.4	Relation between line and phase voltages and currents in balanced systems	T1,T2.R3	1	PPT, Chalk & Talk, & Tutorial
		1.5	Analysis of balanced three phase circuits	T1,T2.R3	1	PPT, Chalk & Talk, & Tutorial
		1.6	Measurement of active and reactive power in balanced three phase systems	T1,T2.R3	1	PPT, Chalk & Talk, & Tutorial
		1.7	Problems on active and reactive power	T1,T2.R3	1	Chalk & Talk, & Tutorial
		1.8	Problem on star connection	T1,T2.R3	1	Chalk & Talk, & Tutorial
		1.9	Problem on deltaconnection	T1,T2.R3	1	Chalk & Talk, & Tutorial
		1.10	Analysis of three phase	T1,T2.R3		



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			unbalanced circuits: Loop method		1	PPT, Chalk & Talk, & Tutorial
		1.11	Star-Delta transformation technique	T1,T2.R3	1	PPT, Chalk & Talk, & Tutorial
		1.12	Two wattmeter methods for measurement of three phase power	T1,T2.R3	1	PPT, Chalk & Talk, & Tutorial
		1.13	derivation	T1,T2.R3	1	Chalk & Talk, & Tutorial
		1.14	Problem on two wattmeter method	T1,T2.R3	1	Chalk & Talk, & Tutorial
		1.15	Overall problems	T1,T2.R3	1	Chalk & Talk, & Tutorial
	Content beyond syllabus (if need)		Power factor meter method			
	Mini Project (if possible)					
	<b>Total</b>				15	
II	CO2: Illustrate the Transient Response of Electrical Circuits for DC Excitations/(K2)	2.1	Transient response of R-L circuits for DC excitations	T1,T2,R2, R3	1	Chalk & Talk, PPT, Active Learning & Tutorial
		2.2	Derivation for R-L circuit	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		2.3	Problems on R-L circuit	T1,T2,R2, R3	1	Chalk & Talk, & Tutorial
		2.4	Transient response of R-C circuits for DC excitations	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		2.5	Derivation for R-C circuit	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		2.6	Transient response of R-L-C circuits for DC excitations	T1,T2,R2, R3	1	Chalk & Talk, PPT, Active Learning & Tutorial
		2.7	Derivation for RLC circuit	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		2.8	Solution using differential equations	T1,T2,R2, R3	1	Chalk & Talk, & Tutorial
		2.9	Problem solving using differential equations	T1,T2,R2, R3	1	Chalk & Talk, & Tutorial
		2.10	Laplace transforms	T1,T2,R2,	1	PPT, Chalk &



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				R3		Talk, & Tutorial
		2.11	Problem solving using laplace transforms	T1,T2,R2, R3	1	Chalk & Talk, & Tutorial
		2.12	Overall Problems	T1,T2,R2, R3	1	Chalk & Talk, & Tutorial
		2.13	Overall Problems	T1,T2,R2, R3	1	Chalk & Talk, & Tutorial
Content beyond syllabus (if need)						
Mini Project (if possible)						
<b>Total</b>					12	
III	CO3: Illustrate the Transient Response of Electrical Circuits for AC Excitations/(K2 )	3.1	Transient response of R-L circuits for AC excitations	T1,T2,R2, R3	11	Chalk & Talk, PPT & Tutorial
		3.2	Derivation for Transient response of R-L circuits for AC excitations	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		3.3	Problems on Transient response of R-L circuits for AC excitations	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		3.4	Transient response of R-C circuits for AC excitations	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		3.5	Derivation for Transient response of R-C circuits for AC excitations	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		3.6	Transient response of R-L-C circuits for AC excitations	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		3.7	Derivation for Transient response of R-L-C circuits for AC excitations	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		3.8	Solution using differential equations	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		3.9	Problem solving using differential equations	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		3.10	Laplace transforms	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		3.11	Problem solving using laplace transforms	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
		3.12	Overall problems	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial



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		3.13	Overall problems	T1,T2,R2, R3	1	PPT, Chalk & Talk, & Tutorial
Content beyond syllabus (if need)		Inverse transmission line parametrs				
Mini Project (if possible)						
<b>Total</b>					13	
IV	CO4: Design different kinds of two port networks filter circuits/(K6)	4.1	Introduction toTwo port network	T1,T2,R3, R4.	1	Chalk & Talk, PPT, Active Learning & Tutorial
		4.2	Two port network parameters and their relations	T1,T2,R3, R4.	1	PPT, Chalk & Talk, & Tutorial
		4.3	Z Parameters	T1,T2,R3, R4.	1	PPT, Chalk & Talk, & Tutorial
		4.4	Y Parameters	T1,T2,R3, R4.	1	PPT, Chalk & Talk, & Tutorial
		4.5	ABCD parameters	T1,T2,R3, R4.	1	PPT, Chalk & Talk, & Tutorial
		4.6	hybrid parameters	T1,T2,R3, R4.	1	PPT, Chalk & Talk, & Tutorial
		4.7	cascaded networks	T1,T2,R3, R4.	1	PPT, Chalk & Talk, & Tutorial
		4.8	Problems on cascaded networks	T1,T2,R3, R4.	1	PPT, Chalk & Talk, & Tutorial
		4.9	pole of network functions	T1,T2,R3, R4.	1	PPT, Chalk & Talk, & Tutorial
		4.10	zeros of network functions	T1,T2,R3, R4.	1	PPT, Chalk & Talk, & Tutorial
		4.11	Overall problems	T1,T2,R3, R4.	1	PPT, Chalk & Talk, & Tutorial
		4.12	Overall problems	T1,T2,R3, R4.	1	PPT, Chalk & Talk, & Tutorial
Content beyond syllabus (if need)						
Mini Project (if possible)						
<b>Total</b>					12	
V	CO5: Define network functions and synthesize networks using Foster and Cauer	5.1	Introduction	T1,T2,,R4	1	PPT, Chalk & Talk
		5.2	Positive Real Function	T1,T2,R4.	1	PPT, Chalk & Talk
		5.3	Basic synthesis procedure	T1,T2,R4	1	PPT, Chalk & Talk
		5.4	Derivation	T1,T2,R4	1	PPT, Chalk & Talk
		5.5	LC immittance functions	T1,T2,R4	1	PPT, Chalk & Talk
		5.6	Problems on LC immittance	T1,T2,R4	1	PPT, Chalk &



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forms./(K1)	functions	T1,T2,R4	1	Talk
	5.7 RC impedance functions and	T1,T2,R4	1	PPT, Chalk & Talk
	5.8 RL admittance function	T1,T2,R4	1	PPT, Chalk & Talk
	5.9 RL impedance function and	T1,T2,R4	1	PPT, Chalk & Talk
	5.10 RC admittance function	T1,T2,R4	1	PPT, Chalk & Talk
	5.11 Foster and Cauer methods	T1,T2,R4	1	PPT, Chalk & Talk
	5.12 problems	T1,T2,R4	1	PPT, Chalk & Talk
Content beyond syllabus (if need)				
Mini Project (if possible)				
<b>Total</b>			12	
<b>Cumulative Proposed Periods</b>			65	

**Text Books:**

S. No.	Authors, Book Title, Edition, Publisher, Year of Publication
1	Van Valkenburg, Network synthesis, 3 <sup>rd</sup> edition, Prentice-Hall of India Private Ltd, 2019.
2	William Hayt and Jack E. Kemmerley, Engineering circuit analysis, 8 <sup>th</sup> edition, Mc Graw Hill Company, 2013.

**Reference Books:**

S. No	Authors, Book Title, Edition, Publisher, Year of Publication
1	Charles K. Alexander, Mathw N.O. Sadiku, Fundamentals of Electric Circuits, 6 <sup>th</sup> Edition, Mc Graw Hill, 2019.
2	A. Chakrabarti, Circuit Theory (Analysis and Synthesis), Dhanpat Rai & Co, 2018.
3	A. Sudhakar, Shyam Mohan S. Pillai, Networks Analysis, 4 <sup>th</sup> edition, The McGraw-Hill Companies, 2017.
4	D. Roy Choudhury, Networks and Systems, 2 <sup>nd</sup> Edition, New Age International publishers, 2013.
5	A. Bruce Carlson, Circuits, 1 <sup>st</sup> Edition, Cengage Learning Publications, 2011.
6	David A. Bell, Electric Circuits, 7 <sup>th</sup> Edition, Oxford publications, 2009.
7	Smarajit Ghosh, Network Theory Analysis and Synthesis, PHI publications.

**Web Details:**

1	<a href="https://nptel.ac.in/content/storage2/courses/108105053/pdf/L-10(GDR)(ET)%20((EE)NPTEL).pdf">https://nptel.ac.in/content/storage2/courses/108105053/pdf/L-10(GDR)(ET)%20((EE)NPTEL).pdf</a>
2	<a href="https://nptel.ac.in/noc/courses/noc14/SEM2/noc14-ec01/">https://nptel.ac.in/noc/courses/noc14/SEM2/noc14-ec01/</a>

	Name	Signature with Date
i.	Faculty-I K K D BHAVANI	
ii.	Course Coordinator K. K. D. Bhavani	
iii.	Module Coordinator N. Lavanya	
iv.	Programme Coordinator A. Satyanarayana	

Principal