DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech., Electrical and Electronics Engineering		
Course Title	Circuit Theory		
Course Code	EEPC10	No. of Credits	4
Course Code of Pre-requisite subject(s)	MAIR12 (Mathematics I)		
Session	Jan. 2023	Section (if, applicable)	B
Name of Faculty	Dr. C. NAGAMANI	Department	E.E.E.
Email	cnmani@nitt.edu	Telephone No.	04312503254
Name of Course Coordinator(s) (if, applicable)			
E-mail	cnmani@nitt.edu	Telephone No. 0431 250 3254	
Course Type	√ Core course	☐ Elective course	

Syllabus (approved in BoS)

Fundamental concepts of R, L and C elements, DC circuits, series and parallel circuits - loop and nodal analysis, AC circuits - complex impedance - phasor diagram, real and reactive power - loop and nodal analysis applied to AC circuits.

Voltage source –current source transformations, Various Network theorems and applications to dc and ac circuits, star-delta transformations.

Resonance in series and parallel circuits, self and mutual inductances, coefficient of coupling - dot convention - analysis of coupled circuits.

Three-phase star and delta circuits with balanced and unbalanced loads - power measurements - power factor calculations.

Time response of RL, RC and RLC circuits for step and sinusoidal inputs.

Text Books:

1. Hayt, W. H, Kemmerly J. E. & Durbin, 'Engineering Circuit Analysis', McGraw Hill Publications, 8th Edition, 2013.
2. Charles K. Alexander, Matthew N.O.Sadiku, 'Fundamentals of Electric Circuits', McGraw-Hill Publications, 5th Edition, 2013.

Reference Books:

1. Joseph. A. Edminister, 'Electric Circuits - Schaum's Outline Series', McGraw-Hill Publications, 6th Edition, 2003.
2. Robins & Miller, 'Circuit Analysis Theory and Practice', Delmar Publishers, 5th Edition, 2012.

COURSE OBJECTIVES

To provide the key concepts and tools in a logical sequence to analyze and understand electrical and electronic circuits

Course outcomes:

1. **apply mesh and nodal analysis techniques and solve simple dc and single phase ac circuits in steady state**
2. **apply network theorems to solve dc and ac circuits with single or multiple independent and dependent sources**
3. **analyze the phenomena of resonance in series-parallel circuits and solve simple electro-magnetic circuits**
4. **perform computations needed in three-phase circuits in steady state**
5. **compute the transient and steady-state responses of simple dc and ac circuits**

CO / PO & PSO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
1	3	3	1	1	2	-	-	-	2	1	1	2
2	3	3	1	1	2	-	-	-	2	1	1	2
3	3	3	1	1	2	-	-	-	2	1	1	2
4	3	3	1	1	2	-	-	-	2	1	1	2
5	3	3	1	1	2	-	-	-	2	1	1	2

COURSE PLAN – PART II

COURSE OVERVIEW

This course is designed to impart the fundamental knowledge and skills that the students graduating in Electrical Engineering should possess. It builds up on the basic concepts of circuit elements exposing the students to several theorems and techniques for modeling electrical circuits or systems. Problem solving and analysing the behaviour of circuits is the hall mark of the course. Individual, group / team tasks are planned as part of this course.

TEACHING AND LEARNING ACTIVITIES

Week	Topic	Mode of Delivery
Weeks 1 to 3 (10 contact hours, including two contact hours for problem solving)	Basics of dc and ac circuits -Concepts and examples	C&T/PPT
	numerical examples/ problemsolving	Tutorial/ Group work
Weeks 4 to 6 (10 contact hours, including two contact hours for problem solving)	Source transformation, Network Theorems, star-delta equivalenceand examples	C&T/PPT
	numerical examples/ problemsolving	Tutorial/ Group work
Weeks 7 to 9 (10 contact hours, including two contact hours for problem solving)	Resonance, analysis of coupledcircuits and examples	C&T/PPT
	numerical examples/ problemsolving	Tutorial/ Group work

Weeks 10 to 12 (10 contact hours, including two contact hours for problem solving)	Three-phase circuits	C&T/PPT
	numerical examples/ problemsolving	Tutorial/ Group work
Weeks 13 to 15 (10 contact hours, including two contact hours for problem solving)	Time response of RL, RC and RLCcircuits	C&T/PPT
	numerical examples/ problemsolving	Tutorial/ Group work
Week 16	**Final assessment**	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	**Assessment 1 (Written test) (1st and 2nd Units)**	6th Week	60 Minutes	20
2	**Assessment 2 Examination(Written test) (3rd and 4th Units)**	12th Week	60 Minutes	20
3	**Take Home / Team Task**	3rd to 13th week	Non-contact hours	15
CPA	**Compensation Assessment***	14th week	60 Minutes	20
4	**Final Assessment ***	16th week	180 Minutes	45

*mandatory; refer to guidelines on page 4

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

Apart from the formal feedback (arranged by academic office) at the end of the course, informal and objective feedback shall be encouraged along the course work for improving the teaching – learning process.

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)

All the students are advised to check their NITT WEBMAIL regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be through webmail.

COMPENSATION ASSESSMENT POLICY

1. Attending all the assessments (Assessment 1, 2, 3 and 4) is MANDATORY
2. If any student misses Assessment-1 or Assessment-2 due to genuine reasons, he/ she can seek permission to write the Compensation Assessment (CPA) with 20% weightage. In any case the maximum compensation will be for 20% only, even if both A1 and A2 are missed. In any case the Compensation Assessment will not be offered as an improvement test.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- **At least 75% attendance in each course is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**

Students with **less than 65% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**

ACADEMIC DISHONESTY & PLAGIARISM

- Any type of malpractice will be punishable.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.

The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office. The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION:

Guidelines: Relevant Academic Regulations

FOR APPROVAL

Course faculty	CC Chairperson	HOD
(Dr C NAGAMANI) 29/3/23	[Dr. S. KAY ALVIZHI] 29/03/23	30/03/23