



DEPARTMENT OF ECE

COURSE PLAN – PART I			
Name of the programme and specialization	B.TECH (ECE)		
Course Title	NETWORK ANALYSIS AND SYNTHESIS		
Course Code	ECPC11	No. of Credits	4
Course Code of Pre-requisite subject(s)	NONE		
Session	July - 2019	Section (if, applicable)	A
Name of Faculty	B.Naga Siva Prasad	Department	ECE
Official Email	naga@nitt.edu	Telephone No.	6301079936
Name of Course Coordinator(s) (if, applicable)			
Official E-mail	naga@nitt.edu	Telephone No.	6301079936
Course Type (please tick appropriately)	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		
Syllabus (approved in BoS)			
<p>Network concept. Elements and sources. Kirchoff's laws. Tellegen's theorem. Network equilibrium equations. Node and Mesh method. Source superposition. Thevenin's and Norton's theorems. Network graphs.</p> <p>First and second order networks. State equations. Transient response. Network functions. Determination of the natural frequencies and mode vectors from network functions.</p> <p>Sinusoidal steady-state analysis. Maximum power-transfer theorem. Resonance. Equivalent and dual networks. Design of equalizers.</p> <p>Two-port network parameters. Interconnection of two port networks. Barlett's bisection theorem. Image and Iterative parameters. Design of attenuators.</p> <p>Two-terminal network synthesis. Properties of Hurwitz polynomial and Positive real function. Synthesis of LC, RC and RL Networks, Foster Forms and Cauer Forms.</p>			
COURSE OBJECTIVES			
<ol style="list-style-type: none"> To make the students capable of analyzing any given electrical network. To make the students to learn synthesis of an electrical network for a given impedance/ admittance function.. 			



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MAPPING OF COs with POs	
Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
1. analyze the electric circuit using network theorems	1,2
2. understand and Obtain Transient & Forced response	1,2
3. determine Sinusoidal steady state response; understand the real time applications of maximum power transfer theorem and equalizer	1,2
4. understand the two-port network parameters, are able to find out two-port network parameters & overall response for interconnection of two-port networks.	1,2
5. synthesize one port network using Foster form, Cauer form.	1,2

COURSE PLAN – PART II			
COURSE OVERVIEW			
<p>Students can analyze any lumped circuits using network tools such as ohm's law, kvl , kcl, nodal and mesh analysis students will be taught about transient and steady state analysis for both dc and ac circuits. Students can able to understand and solve the problems on 1port network functions and two port network parameters.</p>			
COURSE TEACHING AND LEARNING ACTIVITIES			(Add more rows)
S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week-1 (4 Contact hours)	Network concept. Elements and sources. Kirchoff's laws.	Chalk and Talk or PPT whichever is required
2	Week-2 (4 Contact hours)	Tellegen's theorem. Network equilibrium equations. Node and Mesh method.	Chalk and Talk or PPT whichever is required
3	Week-3 (4 Contact hours)	Source superposition. Thevenin's and Norton's theorems. Network graphs.	Chalk and Talk or PPT whichever is required
4	Week-4 (4 Contact hours)	First and second order networks. State equations. Transient response.	Chalk and Talk or PPT whichever is required



	ASSESSMENT – I (20 Marks)		Descriptive type (Written)
5	Week-6 (4 Contact hours)	Network functions. Determination of the natural frequencies and mode vectors from network functions.	Chalk and Talk or PPT whichever is required
6	Week-7 (4 Contact hours)	Sinusoidal steady-state analysis. Maximum power-transfer theorem.	Chalk and Talk or PPT whichever is required
7	Week-8 (4 Contact hours)	Resonance. Equivalent and dual networks. Design of equalizers.	Chalk and Talk or PPT whichever is required
8	ASSESSMENT – II (20 Marks)		Descriptive type (Written)
9	Week-10 (4 Contact hours)	Two-port network parameters. Interconnection of two port networks	Chalk and Talk or PPT whichever is required
10	Week-11 (4 Contact hours)	Barlett's bisection theorem. Image and iterative parameters. Design of attenuators.	Chalk and Talk or PPT whichever is required
11	Week-12 (4 Contact hours)	Two-terminal network synthesis. Properties of Hurwitz polynomial and Positive real function.	Chalk and Talk or PPT whichever is required
	ASSIGNMENT (10 Marks)		Students have to submit the assignments periodically as instructed by the faculty
12	Week-13 (4 Contact hours)	Synthesis of LC, RC and RL Networks, Foster Forms.	Chalk and Talk or PPT whichever is required
13	Week-14 (4 Contact hours)	Synthesis of LC, RC and RL Networks, Cauer Forms.	Chalk and Talk or PPT whichever is required



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14	COMPENSATION ASSESMENT (20 Marks)	Descriptive type (Written)		
15	END ASSESMENT (50 Marks)	Descriptive type (Written)		
COURSE ASSESSMENT METHODS (shall range from 4 to 6)				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	ASSESMENT – I	Week-5	1 Hr	20
2	ASSESMENT – II	Week-9	1 Hr	20
3	ASSIGNMENT	Every month periodically as instructed by the faculty	-	10
CPA	Compensation Assessment*	Week-15	1 Hr	20
4	Final Assessment *	Week-16	3 Hr	50
*mandatory; refer to guidelines on page 4				
COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)				
<ol style="list-style-type: none"> 1. Feedback from the students during Class committee meetings 2. Anonymous feedback through questionnaire 				
COURSE POLICY (including compensation assessment to be specified)				
<u>MODE OF CORRESPONDENCE (email/phone etc)</u>				
<ol style="list-style-type: none"> 1. All the students are advised to come to the class regularly. All the correspondence (schedule of classes/ schedule of assignment/ course material/ any other information regarding this course) will be intimated in the class only. 				
<u>COMPENSATION ASSESSMENT POLICY</u>				
<ol style="list-style-type: none"> 1. Attending all the assessments (Assessment 1 – 3) are MANDATORY for every students. 2. If any student is not able to attend Assessment – I / Assessment – II due to genuine reason and have given prior information about it, then the student is permitted to attend the CPA with 20% weightage of 100 (20 marks) with combined portions of both Assessment I and II. 				



3. In any case, retest will not be considered as an improvement test.(A uniform attendance policy as specified below shall be followed)

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

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- 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, IF ANY

Students can approach the course faculty regarding the doubts in subject in the Department during the office hours with prior information about it either in the class or through E-mail (naga@nitt.edu).

FOR APPROVAL

Course Faculty B. Nagarajapand CC- Chairperson

[Signature]

HOD

[Signature]