

Poornima Group of Colleges, Jaipur

Session: 2011-12 (ODD Sem.)

Name of College: Poornima College of Engineering

Department of Electrical Engineering

Zero Lecture

Name of Faculty: Chandan Singh Branch: EIC

1). Name of Subject with Code: Circuit analysis and synthesis (3EI3)

2). Self-Introduction:

- a). *Name: Chandan Singh*
- b). *Qualification: Bachelor of technology*
- c). *Designation: Lecturer*
- d). *Research Area: Power System*
- e). *E-mail Id:@poornima.org*

3). Introduction of Students:

- a). *Identifying and keeping records of students based on merit/ weak in academics, smart/ dull in extra & co-curricular activity, day scholar/ hosteller, Hindi or English medium, urban or rural family background, their learning style (seeing, hearing, doing) etc.*
- b). *Achievement of students in previous years*

Sr. No.	Year	Result At PCE	Univ. Result (In %)	Name of student scored highest marks with the scored marks.	Fail (no. of students)	Marks between 40%-60% (no. of students)	Marks 60% above (no. of students)

4). Instructional Language: - 70%English; 30% Hindi (English not less than 60%)

5). Introduction to subject:

a). **Relevance to Branch:** *Circuit analysis is very important subject for the students of Electrical Branch because it deals with controlling phenomenon of electrical machines and devices for further reference. Circuit analysis explains about the network, working principle and operation of the instruments and devices used in the fields of electrical engineering. This is very useful in determining the electrical values of physical parameters so that electrical modelling of a physical system can be done.*

b). **Relevance to Society:** *Modern industry relies heavily on automation for economic viability and mass production. The availability of sophisticated instruments and variety of circuit methodologies has greatly improved not only the quality of the products but also contribution to reduction of costs. In the present times, it is impossible to think of industrial production without electricity. Students of Engineering are therefore called upon to learn the rudiments of instruments and control strategies very early in their graduation courses.*

c). **Relevance to Self:** *This subject moves us to the depth of knowledge. The subject has become interesting with the advent of neural networks and all the devices intelligent.*

d). **Relation with laboratory:** This subject is implemented practically in the electrical circuit lab by performing different programmes and the results obtained theoretically can be verified. It also gives idea that how the theorems are implemented in real world.

e). **Connection with previous year and next year:** In the previous year we had studied conventional circuit analysis for modeling of electrical circuits and networks using the simple laws of Block diagram reduction and signal flow graphs. Now we'll study further the concept of steady state stability and transient stability in modern systems.

6). Syllabus of Rajasthan Technical University, Kota

a). Index Terms/ Key Words:

b). RTU Syllabus with Name of Subject & Code

3E13- CIRCUIT ANALYSIS & SYNTHESIS

UNIT 1 : NETWORK THEOREMS AND ELEMENTS : Thevenin's, Norton's, Reciprocity, Superposition, Compensation, Miller's, Tellegen's and maximum power transfer theorems. Networks with dependent sources. Inductively coupled circuits – mutual inductance, coefficient of coupling and mutual inductance between portions of same circuits and between parallel branches. Transformer equivalent, inductively and conductively coupled circuits.

UNIT 2 : TRANSIENTS ANALYSIS : Impulse, step, ramp and sinusoidal response Analysis of first order and second order circuits. Time domain & transform domain (frequency, Laplace) analysis. Initial and final value theorems. Complex periodic waves and their analysis by Fourier analysis. Different kind of symmetry. Power in a circuit.

UNIT 3 : NETWORK FUNCTIONS : Terminals and terminal pairs, driving point impedance transfer functions, poles and zeros. Procedure of finding network functions for general two terminal pair networks. Stability & causality. Hurwitz polynomial, positive real function

UNIT 4 : TWO PORT NETWORKS : Two port parameters and their interrelations – z-parameters, y-parameters, h-parameters, ABCD parameters. Equivalence of two ports, transformer equivalent, interconnection of two port networks. Image parameters. Attenuation & phase shift in symmetrical T and π networks.

UNIT 5 : NETWORK SYNTHESIS : RL & RC networks synthesis, Foster First & Second form, Cauer forms.

c). ABC analysis (RGB method) of unit & topics

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7). Books/ Website/Journals & Handbooks/ Association & Institution:

a). Recommended Text & Reference Books and Websites:

S. No.	Title of Book	Authors	Publisher	Cost (Rs.)	No. of books in Library
Text Books					
T1	Circuit Theory	AK Chakrabarti	Dhanpat rai publication	325	12
T2	A course in electrical circuit analysis	Soni-Gupta	Dhanpat rai publication	175	10
Reference Books					
R1	Circuits and networks	A Sudhakar Shyammohan & S Palli	TMH	-	5
R2	Electrical circuits	David a bell	PHI	350	3
Websites related to subject					
1	www.wikipedia.org				
2	www.ie.org.in				

b). Journals & Handbooks: - Electrical India, International journal of electrical energy system, International journal of power system optimization and current, International journal of control theory and application.

c). Associations and Institutions: - IETE, IEEE, Institute of Engineers

8). Syllabus Deployment: -

a). Total weeks available for academics (excluding exams/ holidays) as per PGC calendar-

Semester	I	III	V	VII
No. of Working days available(Approx.)	79	76	76	72
No. of Weeks (Approx.)	13	12.5	12.5	12

- Total weeks available for covering RTU syllabus- 10-11 weeks (Approx.)
- Total weeks available for special activities (as mentioned below)- 02 weeks (Approx.)

Note: Individual faculty must calculate the exact no. of lectures available according to time table etc. after consultation with HOD.

b). Special Activities (To be approved by HOD, Dean & Campus Director & must be mentioned in deployment):

- Open Book Test- Once in a semester
- Quiz (50% Technical & 50% Aptitude)- Once in a semester
- Special Lectures (SPL)- 10% of total no. of lectures including following
 - One PPT by the faculty, who is teaching the subject
 - SPL by expert faculty at PGC level

iii. SPL by expert from industry/academia (other institution)

- Revision classes:- 1 to 3 turn at the end of semester (Before II Mid Term Exam)
- Solving Important Question Bank- 1 Turn before I & II Mid Term Exam (each) - Total Two turn.

c). *Lecture schedule per week*

i). University scheme (L+T+P) = 3+1/0+0

ii). PGC scheme (L+T+P) = 3/4+1/0+0

Sr. No.	Name of Unit	No. of lectures	Broad Area	Degree of difficulty (High/Medium/Low)	No. of Question in RTU Exam.	Text/ Reference books
1.	NETWORK THEOREMS AND ELEMENTS		Networks with dependent Sources & Inductively coupled circuits	Medium		A K Charkrabarti
2.	TRANSIENTS ANALYSIS		Fourier analysis	High		A K Charkrabarti, SoniGupta
3.	NETWORK FUNCTIONS		Impedance transfer functions	Low		A K Charkrabarti
4.	TWO PORT NETWORKS		Two port parameters and their interrelations	Medium		A K Charkrabarti, Soni Gupta
5.	NETWORK SYNTHESIS		Foster First & Cauer forms.	Medium		A K Charkrabarti

d). *Introduction & Conclusion:* Each subject, unit and topic shall start with introduction & close with conclusion. In case of the subject, it is Zero lecture.

e). *Time Distribution in lecture class:* - Time allotted: 60 min.

- First 5 min. should be utilized for paying attention towards students who were absent for last lecture or continuously absent for many days + taking attendance by calling the names of the students and also sharing any new/relevant information.
- Actual lecture delivery should be of 50 min.
- Last 5 min. should be utilized by recapping/ conclusion of the topic. Providing brief introduction of the coming up lecture and suggesting portion to read.
- After completion of any Unit/Chapter a short quiz should be organized.
- During lecture student should be encouraged to ask the question.

Note: Pl. ensure that each student is having Lecture Note Book. Pl. Write on the black board day and date, name of the teacher, name of sub. with code, unit and lecture no. and topics to be covered at the beginning of each lecture and ensure that students write in lecture note book. Ask students to leave 4/5 pages blank for copying the note from fellow students in case of their absenteeism.

9). Tutorial: - An essential component of Teaching- Learning process in Professional Education.

Objective: - To enhance the recall mechanism.

To promote logical reasoning and thinking of the students.

To interact personally to the students for improve numerical solving ability.

a). *Tutorial processing*: - Tutorial sheet shall be provided to each students

Ist Phase: - It is consisting of questions to be solved in the class assignment session in test mode on perforated sheet given in tutorial notebook and to be collected & kept by respective faculty for review & analysis (20 minutes).

IInd Phase: - Indicating/Initializing the weak issues/ drawback and Evaluating and providing the grade. Making a group with good student for assisting the weak students to explain/solve questions by every student on plain papers given in tutorial note book (20 minutes).

IIIrd Phase: - Solving/ explaining difficulties of lecture class and providing the new home assignment (20 minutes). To be done in tutorial note book.

b). *Home assignment shall comprise of two parts*:

Part (i) Minimum essential questions, which are to be solved and submitted by all with in specified due date.

Part (ii) Other important questions, which may also be solved and submitted for examining and guidance by teacher.

10). Examination Systems:

Sr. No.	Name of the Exam	Max. Marks	% of passing marks	Nature of paper Theory + Numerical	Syllabus coverage (in %)	Conducted by
1.	Ist Mid Term Exam	40	40	40+60 %	60	PGC
2.	IInd Mid Term Exam	40	40	40+60%	40	PGC
3.	University (End) Term Exam	80	30	40+60%	100	RTU

Place & Date: Jaipur

Name of Faculty with Designation
Chandan Singh
Lecturer (EE),PCE.