GOVERNMENT POLYTECHNIC, SAMBALPUR, RENGALI

DEPARTMENT OF E&TC ENGINEERING

LESSON PLAN(WINTER-21)

SUBJECT- CIRCUIT THEORY(TH-2) **SEMESTER-3RD**

NAME OF THE FACULTY- SRI Saroj Kanta Ray

TOTAL NO. OF PERIODS-60(4P/WEEK)

UNIT	DATE	PERIOD	TOPICS TO BE COVERED
1	1st week of November,2021		**CIRCUIT ELEMENTS & ENERGY SOURCES**
		1	Circuit elements (Resistance, Inductance, Capacitance), Scope of network analysis & synthesis.
		2	Voltage Division & Current Division, Energy Sources
		3	Electric charge, electric current, Electrical energy, Electrical potential, R-L-C parameters, Active& Passive Elements.
		4	Energy Sources, Current and voltage sources and their transformation & mutual inductance
		5	Star – Delta transformation
		6	Numerical problems & assignments
2	2nd week of November,2021		**NETWORK THEOREMS (Applications in dc circuits)**
		1	Nodal & Mesh Analysis of Electrical Circuits with simple problem.
		2	Nodal & Mesh Analysis of Electrical Circuits with simple problem.
		3	Nodal & Mesh Analysis of Electrical Circuits with simple problem.
		4	Statement, Explanation & applications- Thevenin's Theorem
		5	Statement, Explanation & applications- Norton's Theorem
		6	Statement, Explanation & applications- Maximum Power transfer Theorem
		7	Statement, Explanation & applications- Superposition Theorem
		8	Statement, Explanation & applications- Millman Theorem
		9	Statement, Explanation & applications- Reciprocity Theorem
		10	Solve numerical problems
		11	Solve numerical problems
		12	Numerical problems & assignments
			Power Relation in AC circuits & Transient Response of passive circuits
		1	Definition of frequency, Cycle, Time period, Amplitude, Average value, RMS value, Instantaneous power & Form factor
		2	Definition of Apparent power, Reactive power, power Triangle of AC Wave.
		3	Phasor representation of alternating quantities

3	1st week of December,2021	**4**	Single phase Ac circuits-Behaviours of A.C. through pure Resistor
		5	Single phase Ac circuits-Behaviours of A.C. through pure Inductor & Capacitor
		6	DC Transients-Behaviors of R-L series circuit & draw the phasor diagram and voltage triangle
		7	DC Transients-Behaviors of R-C series circuit & draw the phasor diagram and voltage triangle
		8	DC Transients-Behaviors of R-L-C series circuit & draw the phasor diagram and voltage triangle
		9	Define Time Constant of R-L, R-C series circuit
		10	Define Time Constant of R-L-C series circuit
		11	Solve numerical simple problems of R-L, R-C, R-L-C series circuit Circuit.
		12	Numerical problems & assignments
4	4th week of December,2021		**RESONANCE AND COUPLED CIRCUITS**
		1	Introduction to resonance circuits & Resonance tuned circuit
		2	Series& Parallel resonance
		3	Expression for series resonance, Condition for Resonance, Frequency of Resonance
		4	Expression for Impedance, Current, Voltage, power, Q Factor and Power Factor of Resonance, Bandwidth in term of Q
		5	Parallel Resonance (RL, RC) derive the expression
		6	Parallel Resonance of RLC derive the expression
		7	Comparisons of Series & Parallel resonance& applications
		8	simple problems of RL & RC circuits
		9	simple problems of RLC circuits
		10	Numerical problems & assignments
5	3rd week of January,2022		**LAPLACE TRANSFORM AND ITS APPLICATIONS**
		1	Laplace Transformation, Analysis and derive the equations for circuit parameters of Step response of R-L circuit
		2	Laplace Transformation, Analysis and derive the equations for circuit parameters of Step response of R-C circuit
		3	Laplace Transformation, Analysis and derive the equations for circuit parameters of Step response of R-L-C circuit
		4	Analysis and derive the equations for circuit parameters of Impulse response of R-L circuit
		5	Analysis and derive the equations for circuit parameters of Impulse response of R-C circuit
		6	Analysis and derive the equations for circuit parameters of Impulse response of R-L-C circuit
		7	Solve numerical problems
		8	Numerical problems & assignments
			Two Port Network Analysis
		1	Network elements, ports in Network (One port, two port)
		2	Network Configurations (T & pie).

6	4th week of January,2022	**3**	Open circuit (Z-Parameter)& Short Circuit(Y-Parameter) Parameters- Calculate open & short Circuit Parameters for Simple Circuits & its conversion
		4	h- parameter (hybrid parameter) Representation, Define T-Network & pie – Network
		5	Numerical problems & assignments
7	2nd week of February,2022		**FILTERS& ATTENUATORS**
		1	Ideal &Practical filters and its applications, cut off frequency, passband and stop band
		2	Classify filters & study their characteristics-low pass, high pass filters
		3	Classify filters & study their characteristics-band pass, band stop filters
		4	Butterworth Filter Design
		5	Attenuation and Gain, Bel , Decibel & neper and their relations.
		6	Attenuators& its applications. Classification-T- Type & PI – Type attenuators
		7	Numerical problems & assignments