Lesson Plan – Electric Circuits & Network (August to November 2026**)**

Course Code: ECPC217 **Category:** PC

Credits: 03 (L:3, T:0, P:0, DCS:1)

Teaching Period: 01.08.2026 to 28.11.2026 (14 Teaching Weeks)

Week No. & Dates	Topic Covered	References	Learning Outcome	Remarks
Week 1 01.08.2026–07.08.2026	**Basics of Network Analysis:** Basic network terminology, nodes, branches, loops; Kirchhoff's laws; formulation of circuit equations	R1, R2	Students will identify basic elements of an electrical network and formulate circuit equations using fundamental laws.	Introduction and numerical practice
Week 2 08.08.2026–14.08.2026	**Node and Mesh Analysis:** Nodal analysis, mesh analysis and application to electrical circuits	R1, R2	Students will analyze electrical circuits using nodal and mesh analysis techniques.	Numerical/problem-solving practice
Week 3 15.08.2026–21.08.2026	**Network Theorems-I:** Superposition theorem, Thevenin theorem and their applications	R1, R2	Students will apply Superposition and Thevenin theorems to simplify and analyze electrical networks.	Derivations and numerical problems
Week 4 22.08.2026–28.08.2026	**Network Theorems-II:** Norton theorem, Maximum Power Transfer theorem and Reciprocity theorem	R1, R2	Students will apply Norton, Maximum Power Transfer and Reciprocity theorems to network problems.	Unit-I completion
Week 5 29.08.2026–04.09.2026	**Graph Theory:** Concept of graph, network graph, nodes and branches, tree of a network, incidence matrix	R1, R3	Students will represent electrical networks using graph-theoretic concepts and construct incidence matrices.	Conceptual + numerical practice
Week 6 05.09.2026–11.09.2026	**Cut-Set and Tie-Set Analysis:** Cut-set, tie-set and analysis of resistive networks; Duality theorem	R1, R3	Students will analyze resistive networks using cut-set and tie-set concepts and explain network duality.	Unit-II completion
Week 7 12.09.2026–18.09.2026	**First-Order Circuits:** Series and parallel R-L and R-C circuits; differential equations; initial and final conditions	R1, R2	Students will formulate and solve first-order circuit equations and determine initial/final conditions.	Numerical/problem-solving
Week 8 19.09.2026–25.09.2026	**Second-Order Circuits:** Series and parallel R-L-C circuits; differential equations; natural/free and forced response	R1, R2	Students will analyze second-order circuits and distinguish free and forced responses.	Numerical practice
Week 9 26.09.2026–02.10.2026	**Transient and Steady-State Response:** Time constants, transient response and steady-state response of electrical circuits	R1, R2	Students will determine time constants and analyze transient and	Unit-III continuation

			steady-state behavior of circuits.	
Week 10 03.10.2026– 09.10.2026	**Laplace Transform Analysis:** Laplace transform approach to circuit analysis; standard inputs—unit, step and ramp inputs	R1, R2	Students will apply Laplace transforms to analyze electrical circuits subjected to standard inputs.	Derivations and numerical problems
Week 11 10.10.2026– 16.10.2026	**Fourier Series:** Trigonometric and exponential Fourier series, discrete spectra and symmetry of waveforms	R1, R3	Students will represent periodic waveforms using Fourier series and interpret their discrete spectra.	Unit-IV
Week 12 17.10.2026– 23.10.2026	**Fourier Analysis of Networks:** Steady-state response to non-sinusoidal periodic inputs; power factor and effective values; Fourier transform and continuous spectra	R1, R3	Students will analyze network response to non-sinusoidal signals and explain continuous frequency spectra.	Numerical/problem-solving
Week 13 24.10.2026– 30.10.2026	**Two-Port Networks:** Introduction to two-port networks; open-circuit impedance (Z) parameters and short-circuit admittance (Y) parameters	R1, R2	Students will understand two-port network representation and determine Z and Y parameters.	Parameter calculations
Week 14 31.10.2026– 06.11.2026	**Two-Port Parameters:** Transmission (ABCD) parameters, introduction to hybrid (h) parameters; comparison/application of two-port parameters; comprehensive revision	R1, R2	Students will determine and interpret transmission and hybrid parameters and select suitable two-port representations.	Unit-V completion + revision

References

R1. *Fundamentals of Electric Circuits* by Charles K. Alexander and Matthew N.O. Sadiku

R2. Network Analysis M. E. Van Valkenburg Prentice Hall of India.

R3. Engineering Circuit Analysis W. H. Hayt, J. E. Kemmerly and S. M. Durbin McGraw Hill.

Subject Teacher

Approved

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