

GOPAL KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY, JEYPORE

GOURAHARI VIHAR, PO: RANIPUT, JEYPORE – 764 005

LESSON PLAN

Subject 1: ELECTRICAL CIRCUIT ANALYSIS

Subject Code: EEPC2001

Name of the Faculty: DEBASHIS SAHU

Semester: 3RD Semester

Branch: ELECTRICAL ENGINEERING

Semester From: July to December

No. of Weeks: 15 Weeks

| Week | Day | Theory / Practical Topics | Classes |
|------|-----|---|----------|
| 1 | | Module I – Graph Theory and Network Theorems | 8 |
| | 1 | Graph of Network, Trees, Cotrees and Loops | 1 |
| | 2 | Number of Possible Trees of a Graph and Incidence Matrix | 1 |
| | 3 | Cut-set Matrix, Tie-set and Loop Currents | 1 |
| | 4 | Interrelationship among Various Matrices and Dual Networks | 1 |
| 2 | 5 | Superposition Theorem and Thevenin's Theorem | 1 |
| | 6 | Norton's Theorem and Maximum Power Transfer Theorem | 1 |
| | 7 | Reciprocity, Compensation and Millman's Theorem | 1 |
| | 8 | Substitution Theorem and Numerical Problems | 1 |
| 3 | | Module II – Time Domain and Coupled Circuit Analysis | 9 |
| | 9 | Source-free RC and RL Circuits | 1 |
| | 10 | Singularity Functions and Step Response of RC Circuit | 1 |
| | 11 | Step Response of RL Circuit | 1 |
| | 12 | Initial and Final Conditions in Network Elements | 1 |
| 4 | 13 | Source-free Series and Parallel RLC Circuits | 1 |
| | 14 | Step Response of Series and Parallel RLC Circuits | 1 |
| | 15 | Dot Convention and Coefficient of Coupling | 1 |
| | 16 | Series and Parallel Coupled Circuits | 1 |
| 5 | 17 | Electrical Equivalent of Magnetically Coupled Circuits | 1 |
| | | Module III – Laplace Transform | 6 |
| | 18 | Definition and Properties of Laplace Transform | 1 |
| | 19 | Inverse Laplace Transform: Simple and Repeated Poles | 1 |
| | 20 | Inverse Laplace Transform: Complex Poles | 1 |
| 6 | 21 | Gate Function, Impulse Function and Periodic Functions | 1 |
| | 22 | Convolution Integral | 1 |
| | 23 | Circuit Analysis in s-domain with and without Initial Conditions | 1 |
| | | Module IV – Resonance, Two Port Networks and Filters | 8 |
| 7 | 24 | Resonance in Series and Parallel RLC Circuits | 1 |
| | 25 | Selectivity, Bandwidth and Q-factor | 1 |
| | 26 | Introduction to Two-port Networks | 1 |
| | 27 | Impedance and Admittance Parameters | 1 |
| 8 | 28 | Transmission and Hybrid Parameters | 1 |
| | 29 | Interrelationship between Parameters | 1 |
| | 30 | Interconnections and Symmetry of Two-port Networks | 1 |
| | 31 | Introduction to Passive and Active Filters | 1 |
| 9 | | Module V – Network Functions and Passive Network Synthesis | 5 |
| | 32 | Network Functions, Poles and Zeroes | 1 |
| | 33 | Driving Point and Transfer Functions | 1 |
| | 34 | Time Domain Behaviour from Pole-zero Plot | 1 |
| 10 | 35 | Positive Real Function and Foster Forms | 1 |
| | 36 | Cauer Forms and Numerical Problems | 1 |
| | 37 | Positive Real Function and Foster Forms | 1 |
| | 38 | Cauer Forms and Numerical Problems | 1 |
| 11 | 39 | Tutorial and Numerical Problem Solving | 1 |

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|----|----|--|---|
| | 40 | Revision of Network Theorems | 1 |
| | 41 | Revision of Network Theorems | 1 |
| | 40 | Revision of Network Theorems | 1 |
| 12 | 42 | Revision of Laplace Transform Applications | 1 |
| | 43 | Viva and Doubt Clearing Session | 1 |
| | 44 | | 1 |
| | 45 | | 1 |
| 13 | 46 | Model Question Discussion | 1 |
| | 47 | Model Question Discussion | 1 |
| | 48 | Assignment Discussion | 1 |
| | 49 | Assignment Discussion | 1 |
| 14 | 50 | Unit-wise Revision | 1 |
| | 51 | Unit-wise Revision | 1 |
| | 52 | Numerical Practice Session | 1 |
| | 53 | Numerical Practice Session | 1 |
| 15 | 54 | Class Test / Assessment | 1 |
| | 55 | Class Test / Assessment | 1 |
| | 56 | Course Summary and Wrap-up | 1 |
| | 57 | Course Summary and Wrap-up | 1 |

Books Recommended

1. Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N. O. Sadiku – McGraw Hill Publication.
2. Networks and Systems – D. Roy Choudhury – New Age International Publications.
3. Engineering Circuit Analysis – W. H. Hayt and J. E. Kemmerly – McGraw Hill Education.
4. Network Analysis – M. E. Van Valkenburg – Prentice Hall.