

Outline**Electric and Electronic Components**

- 1.1. Basic Circuit Quantities and Relations
- 1.2. Two-Terminal Linear Components
- 1.3. Multi-Terminal Nonlinear Components
- 1.4. Linear Models for Nonlinear Components
- 1.5. Terminal Relationships

Circuit Topology

- 2.1. Nodes, Meshes and other topological terms and concepts
- 2.2. Trivial and Non-Trivial Connections
- 2.3. Kirchhoff's Laws
 - 2.3.1. Kirchhoff's Current Law
 - 2.3.2. Kirchhoff's Voltage Law
- 2.4. Complete Sets of Circuit Equations
- 2.5. OP-AMP circuits

AC Steady State Solutions

- 3.1. DC solutions
- 3.2. Phase Relations and Phasors
- 3.3. Impedance and Admittance
- 3.4. Series and Parallel Connections
- 3.5. Complete Sets of AC Circuit Equations

Solution Techniques

- 4.1. Superposition
- 4.2. Symmetry
- 4.3. Equivalent Transformations of Electric Circuits
 - 4.3.1. Equivalent / Input / Output Impedances
 - 4.3.2. Equivalent Tx of Passive Components
 - 4.3.3. Equivalent Tx of Nonideal Sources
- 4.4. Thevenin's Theorem
- 4.5. Transfer Functions
- 4.6. Nodal Analysis

Transient Analysis

- 5.1. Determination of Initial Conditions
- 5.2. Physical Meaning of Solution Components
- 5.3. First-Order Transient Problems
 - 5.3.1. Time-Domain Solution Techniques
 - 5.3.2. Frequency-Domain Solution Techniques
- 5.4. Second-Order Transient Problems

Applications of Electric Circuits

- 6.1. Frequency Response and Filters
- 6.2. Linear regulators
- 6.3. Switching supplies