

# AC Circuit Overview



Here is the topic tree for the "Alternating Current" chapter from your PDF:

## 1. Introduction

- Overview of AC (Alternating Current) and its applications.
- Comparison with direct current (DC).

## 2. AC Voltage Applied to a Resistor

- Explanation of how AC voltage drives current through a resistor.
- Kirchhoff's loop rule applied to AC circuits.
- Ohm's law for AC circuits.
- Phase relationship between voltage and current in a resistor.
- Average power dissipation in resistors.

## 3. AC Voltage Applied to an Inductor

- Inductive reactance and its effect on current.
- Phase difference between voltage and current in an inductor.
- Power in inductive circuits.

## 4. AC Voltage Applied to a Capacitor

- Capacitive reactance and current-voltage relationships in a capacitor.
- Phase difference in capacitive circuits.
- Power in capacitive circuits.

## 5. AC Voltage Applied to a Series LCR Circuit

- Solving LCR circuits using phasor diagrams.
- Impedance and resonance in LCR circuits.
- The phenomenon of resonance in AC circuits.
- Quality factor and sharpness of resonance peaks.

## 6. Power in AC Circuits

- Calculation of power in AC circuits.
- Concept of power factor and its significance.
- Wattless current in purely inductive or capacitive circuits.

## 7. Transformers

- Working principle of transformers.
- Step-up and step-down transformers.
- Losses in transformers (flux leakage, resistance, eddy currents, and hysteresis).

This structure provides a comprehensive view of the alternating current topic, covering the fundamental concepts and practical applications in circuits.