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Linear Circuits



An introduction to electric circuit elements and a study of circuits containing such devices.

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Module 2

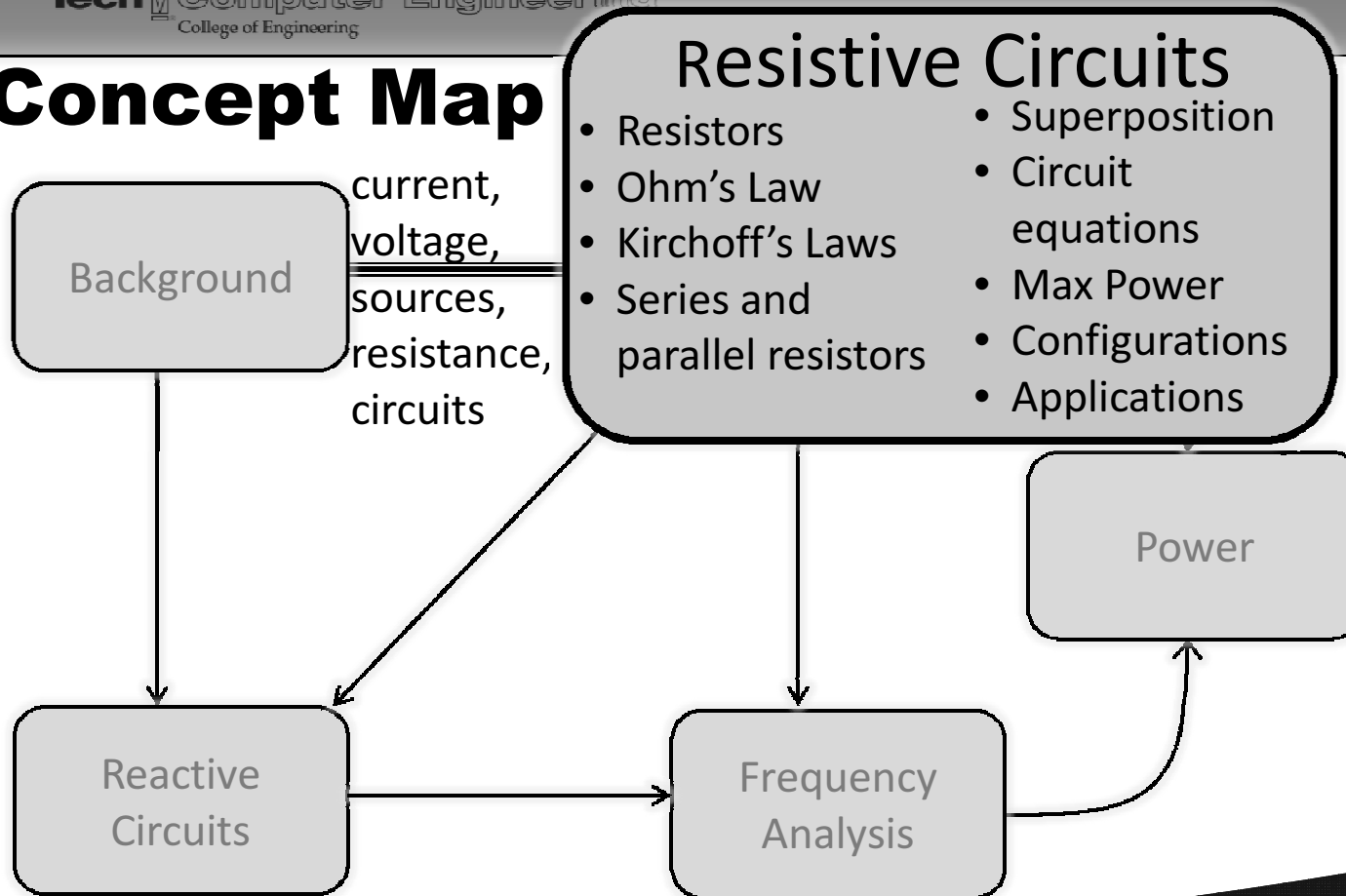
Resistive Circuits

Wrap Up



Summary of Resistive Circuits Module

Concept Map



Important Concepts and Skills

◎ RESISTANCE

- Be able to reduce resistive networks to a single equivalent resistance using parallel and series connections

◎ KIRCHOFF'S LAWS

- Understand Kirchhoff's Voltage Law (KVL) and Kirchhoff's Current Law (KCL)
- Be able to apply KVL and KCL to circuits to obtain equations
- Be able to compute voltages and currents from the voltage divider law and the current divider laws
- Understand superposition and its application in circuits to find specific voltages and currents

Important Concepts and Skills

◎ **PHYSICAL CIRCUITS AND COMPONENTS**

- Given a color chart, be able to identify physical resistor values and tolerances
- Understand the purpose of a protoboard (breadboard) and its basic operation
- Understand how current can be measured in a circuit using the voltage divider law

◎ **SUPERPOSITION**

- Given a circuit with multiple sources, be able to use the Superposition Principle to solve for circuit voltages and currents

Important Concepts and Skills

◎ **SYSTEMATIC SOLUTION METHODS**

- Have a basic understanding of mesh analysis, node analysis, Thévenin equivalent and Norton equivalent circuits and when to use one versus another
- Be able to solve for specific voltages and currents in a given circuit

◎ **MAXIMUM POWER TRANSFER**

- Be able to compute the load resistance that maximizes the power

Important Concepts and Skills

◎ **WYE AND DELTA CIRCUITS**

- Know the transformation
- Understand that these configurations may be used in different applications, such as 3 phase circuits

◎ **APPLICATIONS: RESISTORS IN SENSORS**

- Know examples of resistors that vary with physical quantities
- Understand how a potentiometer is used to measure position or angle
- Know when a Wheatstone Bridge is used in a practical application
- Be able to write equations for a Wheatstone Bridge

Concept Map

