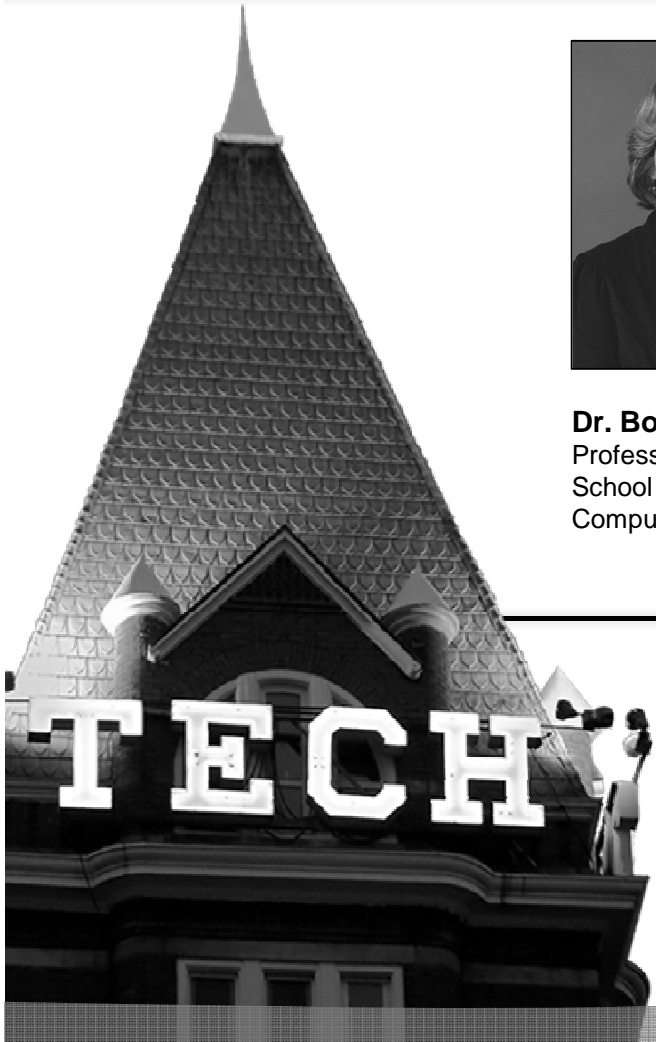


Linear Circuits



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



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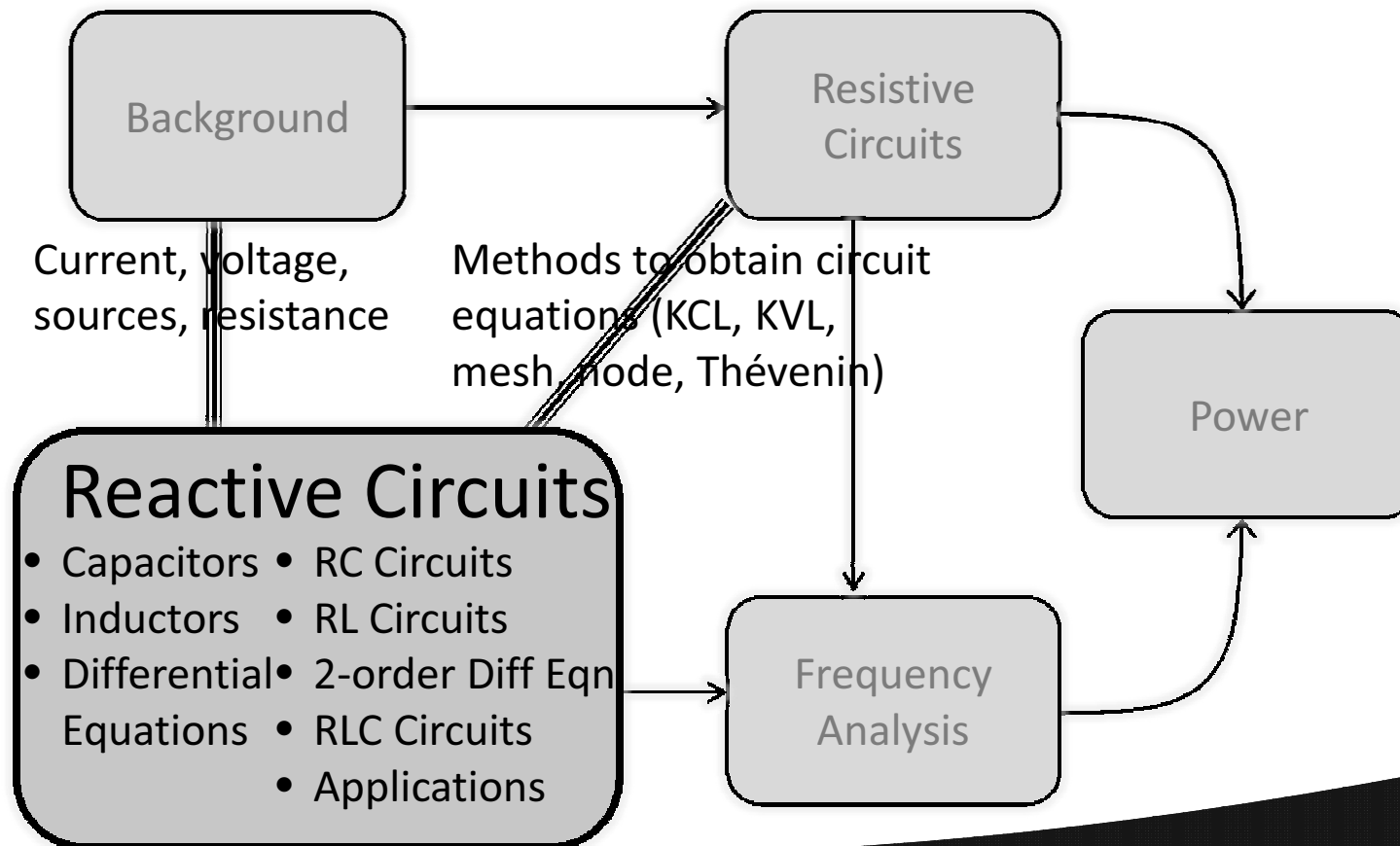
Module 3

Reactive Circuit Wrap Up

Summary of Reactive Circuits Module

School of Electrical and Computer Engineering

Concept Map



Important Concepts and Skills

◎ CAPACITANCE AND CAPACITORS

- Understand the basic structure of a capacitor and its fundamental physical behavior
- Be able to use the i - v relationship to calculate current from voltage or vice versa
- Be able to reduce capacitor connections using parallel and series connections
- Be able to calculate energy in a capacitor
- Be able to sketch current/voltage/power/energy curves

Important Concepts and Skills

◎ INDUCTANCE AND INDUCTORS

- Be able to describe the construction and behavior of an inductor
- Be able to use the i - v relationship to find current through an inductor from the voltage across it, and vice versa
- Be able to explain how a voltage is created across an inductor
- Be able to analyze inductors in series/parallel
- Be able to calculate the energy in an inductor
- Be able to sketch current/voltage/power/energy curves

Important Concepts and Skills

◎ **FIRST-ORDER DIFFERENTIAL EQUATIONS**

- Given a constant input, be able to determine the steady-state value, time constant, and sketch the response

◎ **RC CIRCUITS AND RL CIRCUITS**

- Be able to write a differential equation governing the behavior of the circuit
- Be able to calculate the time constant, steady-state value, and sketch the response

Important Concepts and Skills

◎ **2ND ORDER DIFFERENTIAL EQUATIONS**

- Be able to identify the steady-state value
- Be able to predict the type of response from the roots (underdamped, critically damped, overdamped)

◎ **RLC CIRCUITS**

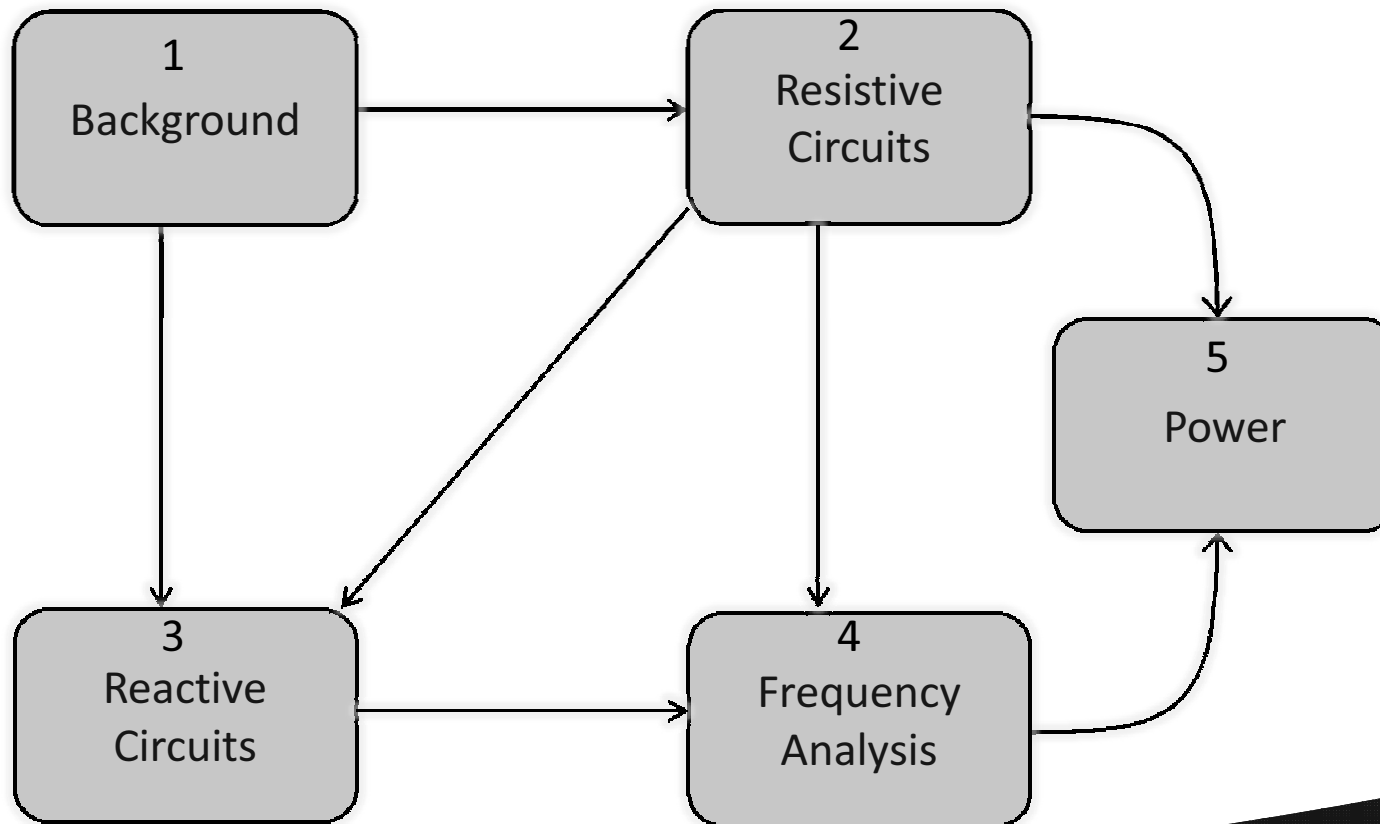
- Be able to write the differential equation that governs the behavior
- Be able to predict the type of response (underdamped, overdamped, critically damped)
- Be able to compute the damping factor and the resonant frequency
- Know that the smaller the damping factor, the larger the oscillations

Important Concepts and Skills

© APPLICATIONS

- Know the purposes of an oscilloscope and a function generator
- Know several applications of inductors and capacitors when they are used with non-electrical components

Concept Map



Reminder

- ⦿ Do all homework for this module
- ⦿ Study for the quiz
- ⦿ Continue to visit the forum