

Circuits II
Tennessee Tech University

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Introduction

This document pertains to everything that is taught in the Circuits II course taught by Dr. Jeffrey Austen. To give the reader a gist of the topics pertaining this document are "Circuit equations in terms of differential equations (ch.9), Natural Response of RLC circuit (ch.9), Forced Response of RLC Circuit (ch.9), Phasors and Impedance (ch.10), AC Steady State Power (ch.11), Three-phase power (Ch.12), and Frequency Response (Ch.13).

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Chapter 1

Chapter 9

1.1 Circuit equation as Differential Equations

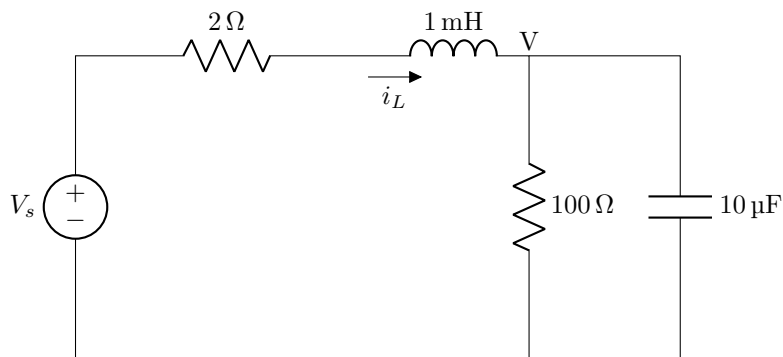


Figure 1.1: P 9.2-1

For problems like these a combination of KCL and KVL is used.

Note: $V = V_c(t)$

$$\text{KCL : } i_L = \frac{V}{100} + C \frac{dv_c(t)}{dt}$$

$$\text{KVL : } V_s = 2i_L + L \frac{di_L(t)}{dt} + V$$

Combining KCL and KVL yields