Saint Martin's University

ME316
Lab 04 – RLC Frequency Response Prelab

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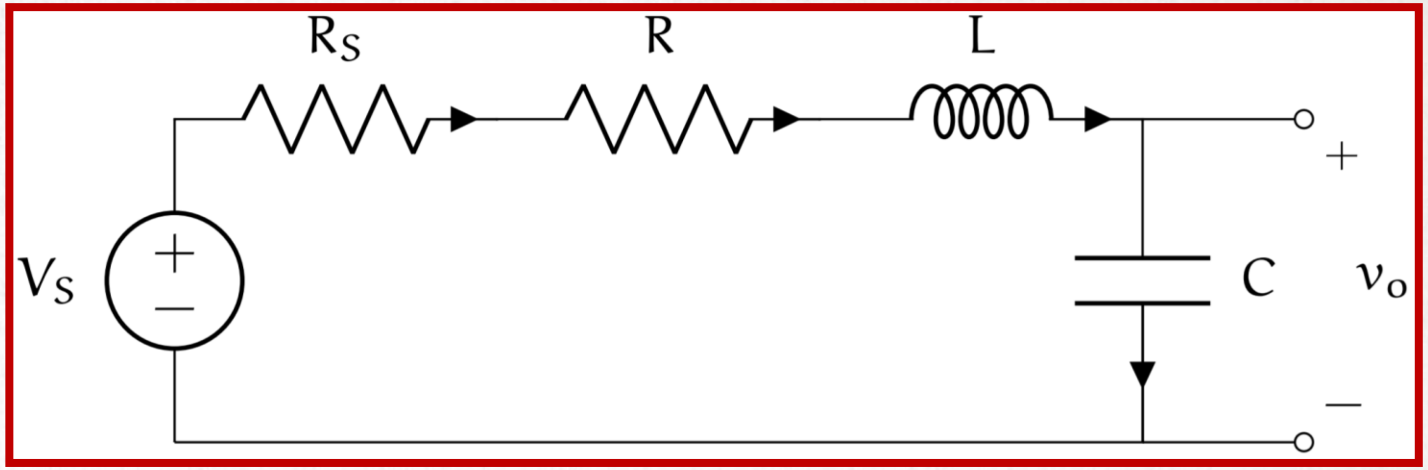
OVERVIEW

- No LabVIEW this time!
- Use function generators instead
  - Source voltage $V_s - v_{R_s}$
  - Output voltage v_c
  - Phase shift ϕ
- Compare data to frequency response $M(\omega)$ and $\phi(\omega)$ with impedance analysis



RLC circuit diagram

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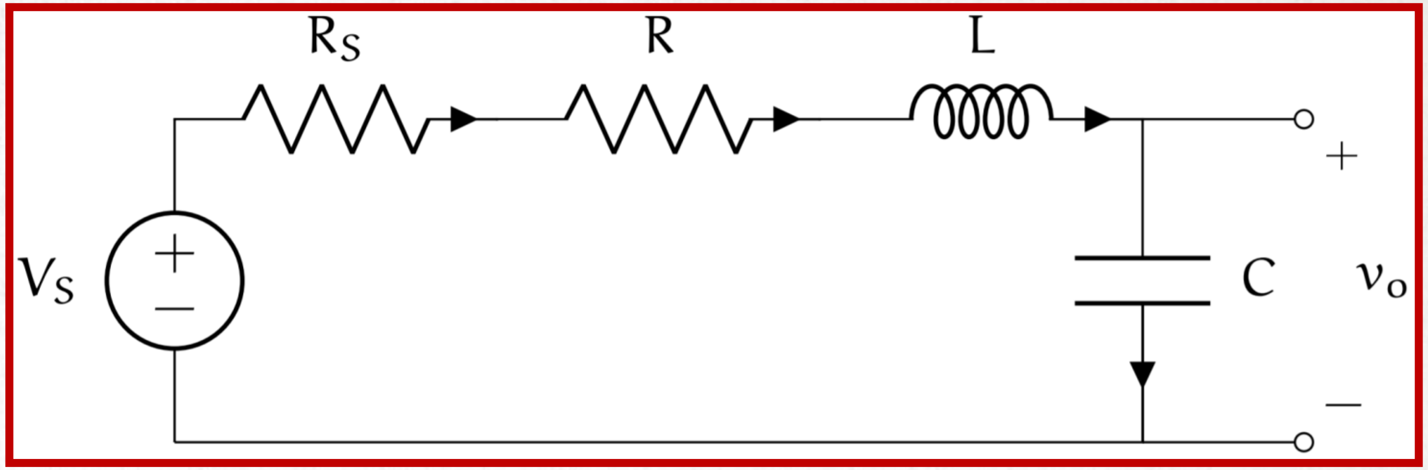
OVERVIEW

- No LabVIEW this time!
- Use function generators instead
  - Source voltage $V_s - v_{R_s}$
  - Output voltage $v_c(\omega)$
  - Phase shift $\phi(\omega)$
- Compare data to frequency response $M(\omega)$ and $\phi(\omega)$ with impedance analysis

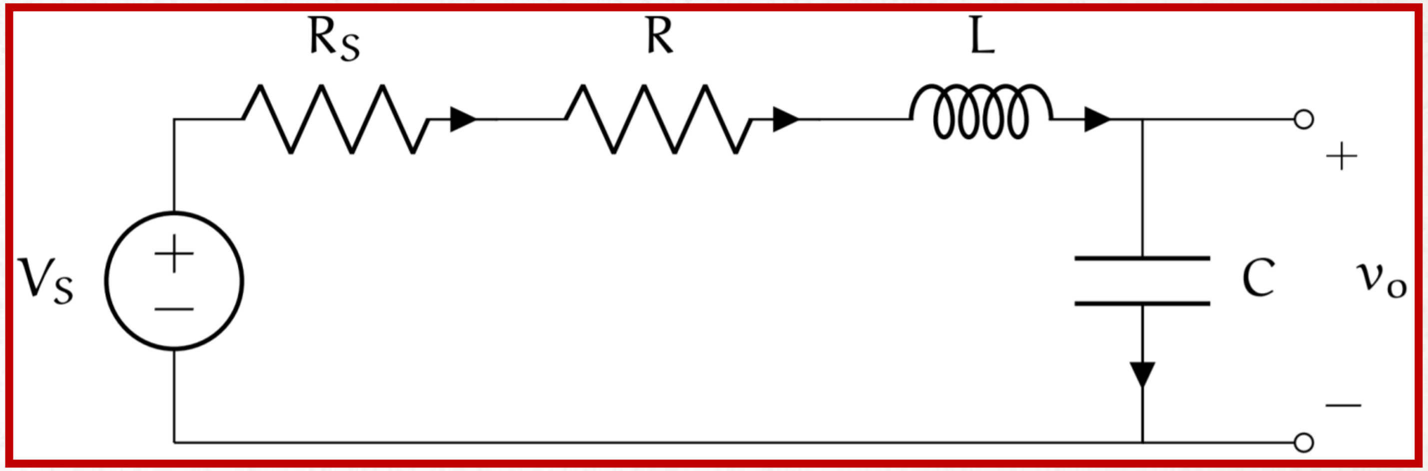


RLC circuit diagram

Magnitude ratio: $M(\omega) = \frac{v_c}{V_s - v_{R_s}}$

USING FUNCTION GENERATORS/OSCILLOSCOPES

- Function generators will **attenuate voltage inputs** without telling you
- In our case, the voltage data is normalized in $M(\omega)$, so our data should be fine



BODE PLOTS

- A way of plotting frequency response for large ranges of ω
- Captures both $M(\omega)$ and $\phi(\omega)$
- You will use this again in **system dynamics** and **control systems**, but in more detail