ECE 3043 Summer 2018
Homework Problem Set No 1 for Experiment No. 2

Due Second Meeting Week of May 28

1. For the circuit shown above derive the complex transfer function $T(s) = V_o/V_i$. Express it as a function of the symbols for the resistors and capacitors the complex frequency variable s. Simplify it as

$$T(s) = K\frac{1 + s\tau_z}{1 + s\tau_p} \tag{1}$$

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2. Plot the Bode plot for the circuit using Mathcad. Plot the frequency response one decade below the lowest critical frequency and one decade above the highest critical frequency. Plot the magnitude in dB and the phase in degrees. The values of the circuit components are $R_1 = 43\,\text{k}\Omega$, $R_2 = 3\,\text{k}\Omega$, $C_1 = 0.1\,\mu\text{F}$, and $C_2 = 1\,\text{nF}$.

3. Make the same plot as in Problem 2 using Matlab.

4. Make the same plot as in Problem 2 using National Instruments SPICE (Multisim).

5. Make the same plot as in Problem 2 using LTSpice (text editor input mode).