

Lab 3 Prelab: Sallen-Key Filter

EEL 4514L: Comm. Laboratory

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$$R := 8.2 \cdot 10^3 \quad C := 0.01 \cdot 10^{-6}$$

$$f_{\min} := 1 \quad f_{\max} := 10^5 \quad N := 1000 \quad m := 0..N-1$$

$$F_{\min} := \log(f_{\min}) \quad F_{\max} := \log(f_{\max}) \quad F_m := 10^{\left[F_{\min} + m \cdot \frac{(F_{\max} - F_{\min})}{N-1} \right]}$$

These parameters set up a logarithmic sequence of frequencies for the plot.

$$H(s) := \frac{1}{R^2 \cdot C^2 \cdot s^2 + 2 \cdot R \cdot C \cdot s + 1} \quad \text{Sallen-Key transfer function}$$

$$A(f) := 20 \cdot \log(|H(j \cdot 2 \cdot \pi \cdot f)|) \quad \text{Magnitude response}$$

$$\theta(f) := \frac{\arg(H(j \cdot 2 \cdot \pi \cdot f))}{\pi} \quad \text{Phase response, in multiples of } \pi$$

$$f_b := \frac{1}{2 \cdot \pi \cdot R \cdot C} \quad f_b = 1.941 \times 10^3 \quad \text{6dB break frequency} \quad A(f_b) = -6.021$$
$$\theta(f_b) = -0.5$$

