

**ECE 209L - FOURIER SERIES - LAB 22**  
**STEADY STATE RESPONSES TO PERIODIC INPUTS - PART I**

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**OBJECTIVE**

The objective of this lab is to design a second order RLC bandpass filter that passes the first harmonic of a 10KHz pulse train while "pretty much" filtering out the others.

**DESIGN**

1. Find  $f_p$  for your filter
2. Choose a  $Q_p$  for your filter. Explain how you chose it
3. Find the transfer function  $G(jf)$  for your filter
4. Make use of Mathcad to obtain a graph of the magnitude of your transfer function with frequency  $f$  plotted on a log scale.
5. Make use of Mathcad to obtain a graph of your  $y(t)$  as a sum of sinusoids
6. Assuming it looks like your filter will do a good job, find practical values for R, L and C.
7. Draw a circuit diagram for your filter.