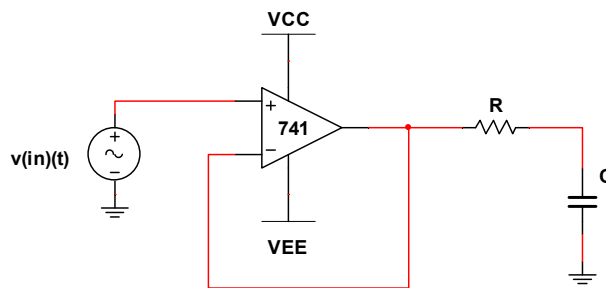# FLORIDA INTERNATIONAL UNIVERSITY
COLLEGE OF ENGINEERING AND COMPUTING
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

EEL 3110L-CIRCUITS LAB

SIXTH ACTIVITY Impedance, Phase Shift, and Filter

Please do the computer simulations before or after the lab.
(it's recommended that you finish it before).

1- Set up the following R-C circuits.

$v_{in}(t) = V_m \sin(\omega t)$ volts

R > 220Ω
C ≥ 0.1μF
V_m ≥ 150mV

Measure and make plots of $v_{in}(t)$ and $v_c(t)$ on the same graph as well measure and tabulate phase shift between $v_{in}(t)$ and $v_c(t)$ for the given conditions:
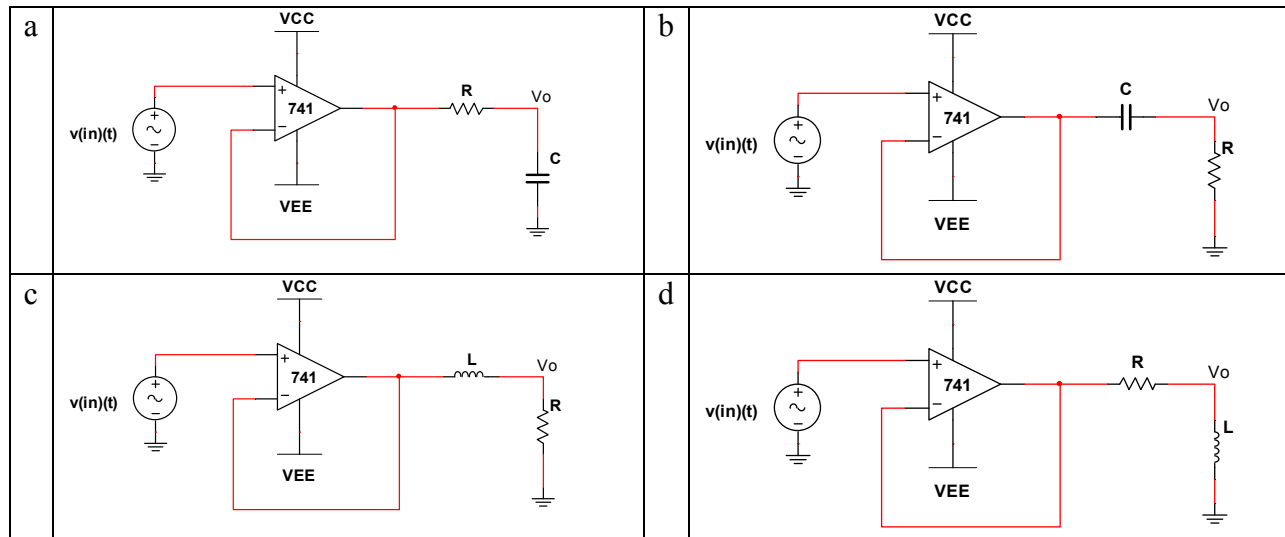
a) $\omega = \dfrac{1}{RC}$

b) $\omega = \dfrac{1}{2RC}$

c) $\omega = \dfrac{1}{10RC}$

d) $\omega = \dfrac{2}{RC}$

e) $\omega = \dfrac{10}{RC}$

Tips: Pick a value for R and C, then change ω according to the conditions

Briefly explain and comment your results

2- Introduction to filter.

Set up the following circuits while selecting R, L, and C freely.

a	b
VCC 741 v(in)(t) R Vo C VEE	VCC 741 v(in)(t) C Vo R VEE

c	d
VCC 741 v(in)(t) L Vo R VEE	VCC 741 v(in)(t) R Vo L VEE

Sweep the frequency for different ranges from 100Hz till 20kHz, observe Vo vs ω.

For example: 100Hz – 1kHz, 1kHz – 10kHz, 10kHz-20kHz, etc.

Classify each filter (L.P., H.P., B.P., B.S., etc.)

***Note: You can use Bode Plot of MyDAQ to sweep the frequency for as much as 20kHz

Briefly explain and comment your results.

Write a brief summary of today activities. Remember to keep your records and own comments in your lab notebook.

GR/CC/DL   Summer 2013