

**Concordia University**  
**ELEC372 Fundamentals of Control Systems**  
**Homework #9**  
**Professor Amir G. Aghdam**

1. Plot the Nyquist diagram for the transfer function  $\frac{e^{-t_0s}}{s(s+1)^2}$  for:
  - a)  $t_0 = 0$
  - b)  $t_0 = 0.1$
  - c)  $t_0 = 1$
  
2. Sketch the Bode plots for the following transfer functions:
  - a)  $G(s) = \frac{-s}{(s+1)(s-1)}$
  - b)  $G(s) = \frac{1-s}{s(s+1)}$
  - c)  $G(s) = \frac{e^{-0.2s}}{s(s+1)}$
  - d)  $G(s) = \frac{10(s+1)}{s(s^2 + 20s + 100)}$
  
3. Sketch the Nyquist diagram for the systems with the following transfer functions:
  - a)  $G(s) = \frac{1}{(1+0.5s)(1+2s)}$
  - b)  $G(s) = \frac{1+0.5s}{s^2}$
  
4. Sketch the Bode plot for the systems given in Problem 3.