



# MEEG 311 – Lecture 26

## Vibration and Control

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### **Goals:**

- Definition of the gain and phase crossover frequencies:
  - The gain crossover frequency is indicative of the bandwidth of the system
- Gain and phase margins for unity feedback systems:
  - Phase margin: at the gain crossover frequency, how much phase separates the phase curve from  $-180$
  - Gain margin: at the phase crossover frequency, how much gain is required in order for the magnitude plot to cross the 0dB line (magnitude = 1)
- Design example:
  - Critical gain computation using the root locus (review of root locus)
  - Critical gain computation using Routh's stability criterion (review of Routh's criterion)
  - Gain and phase margins