Notes in ECEN 5448

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February 29, 2016

Lecture

nyquist stability continued.

Designing compensators from bode plots.
crossover frequency and phase margin

for compensator, you can back out where the pole needs to be to effect a given frequency with:

$$\omega = \frac{1 - z_1}{T}$$

breakpoints at:

$$|1 - z_1| = \omega T$$

$$|1 - p_1| = \omega T$$

very accurate if $\omega T \leq 0.1$ sampling frequency is about 60X the breakpoint frequency you want.
works till $\omega T \leq 8$ is 45 degrees.

lead used to improve transient response, lag used to improve steady-state characteristics.

usually for lag compensators, the pole is really close to 1 and the zero is close to 1 as well.

margin command for gain and phase margins.