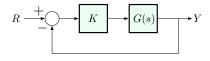
## Frequency-Response Design Method: Main Idea



## Two-step procedure:

- 1. Plot the frequency response of the open-loop transfer function KG(s) [or, more generally, D(s)G(s)], at  $s = j\omega$
- 2. See how to relate this open-loop frequency response to closed-loop behavior.

## We will work with two types of plots for $KG(j\omega)$ :

- 1. Bode plots: magnitude  $|KG(j\omega)|$  and phase  $\angle KG(j\omega)$  vs. frequency  $\omega$  (could have seen it earlier, in ECE 342)
- 2. Nyquist plots:  $\operatorname{Im}(KG(j\omega))$  vs.  $\operatorname{Re}(K(j\omega))$  [Cartesian plot in s-plane] as  $\omega$  ranges from  $-\infty$  to  $+\infty$