Note Title 1/13/2022

* Gain Cross Over frequency (ω_{gc}): The frequency at which the magnitude is 0dB, is called gain crossover frequency.

* Phase crossover frequency (ω_{pc}): The frequency at which the phase angle is -180° is called phase cross-over frequency.

* Gain Margin (GM): It is the factor by which the system gain is increased to bring the system to the verge of stability i.e. Marginaly stable.
  - It is the reciprocal of magnitude at ω_{pc}

$$\therefore \boxed{GM = \frac{1}{|GH(j\omega)|_{\omega=\omega_{pc}}} \quad \text{in linear}}$$

$$\boxed{GM|_{dB} = -20 \log |G(j\omega)|_{\omega=\omega_{pc}}}$$

* Phase Margin (PM): phase margin is the additional phase lag required to add to the system to bring the system to the verge of stability i.e. (MS)

$$\boxed{PM = 180^\circ + \angle GH|_{\omega=\omega_{gc}}}$$