

EENG307: Second Order Systems¹

Lecture 11

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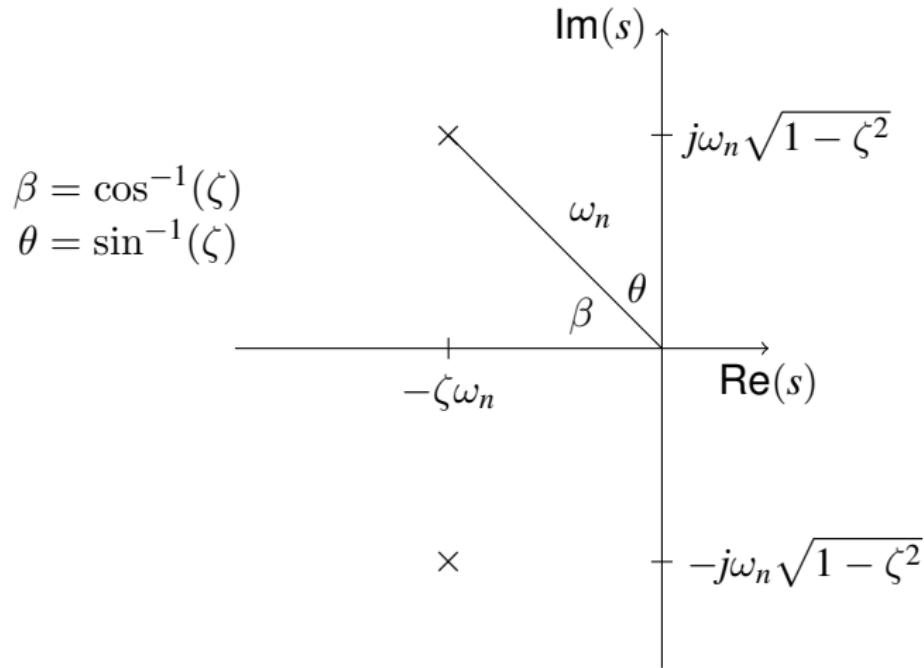
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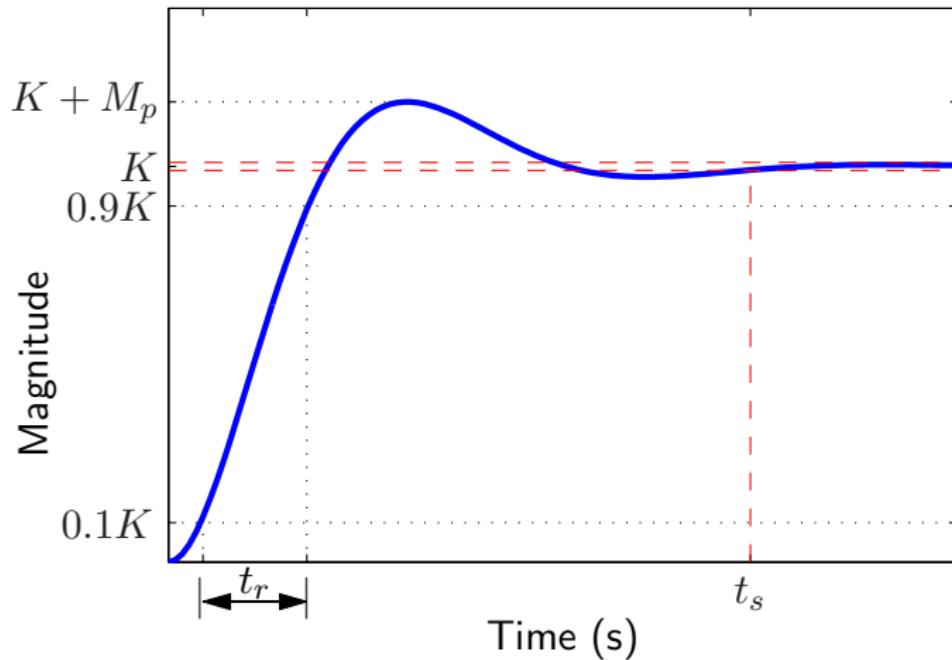
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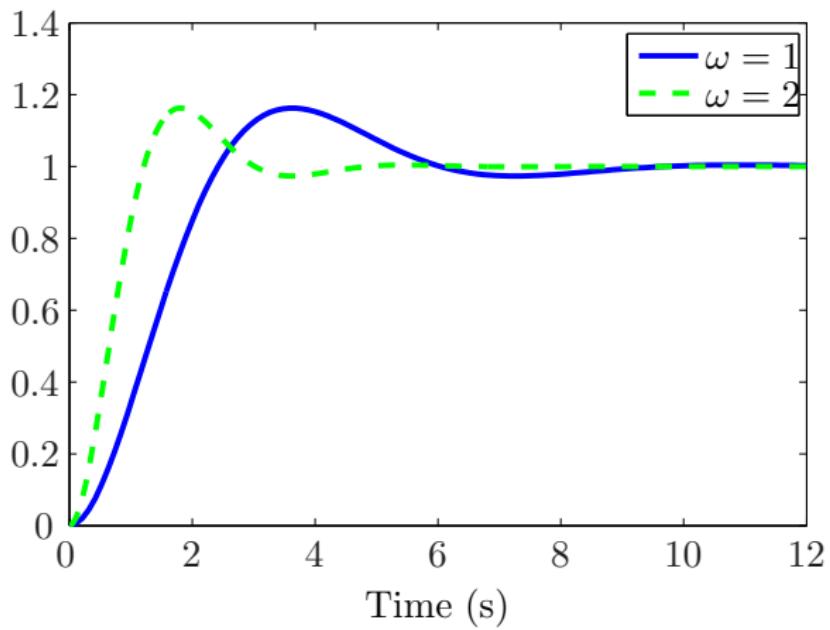
Under-damped poles in complex plane



Second Order Step Response Specifications



Step Response with Varying ω_n



Equation for step response

$$y(t) = K - Ke^{-\zeta(\omega_n t)} \left[\cos(\sqrt{1 - \zeta^2}(\omega_n t)) + \frac{\zeta}{\sqrt{1 - \zeta^2}} \sin(\sqrt{1 - \zeta^2}(\omega_n t)) \right]$$

Step Response in Normalized Time

