



Course of
"Automatic Control Systems"
2024/25

Project

Prof. Francesco Montefusco

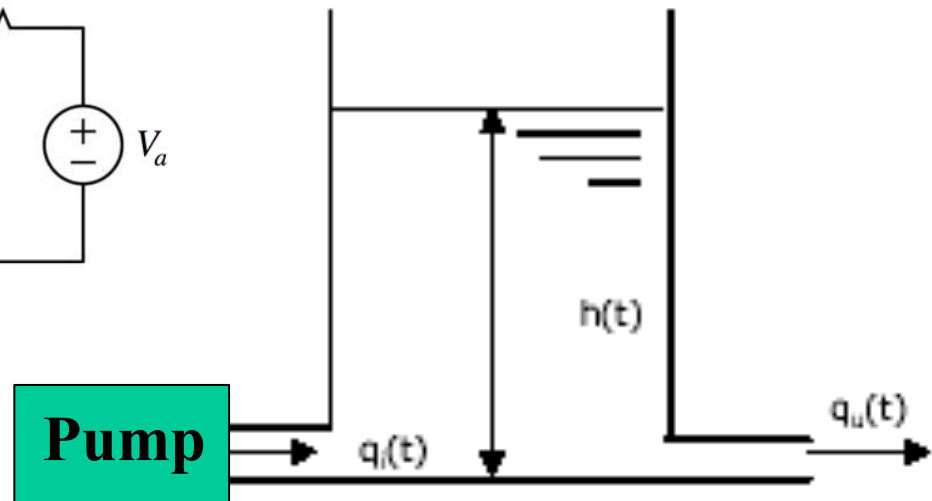
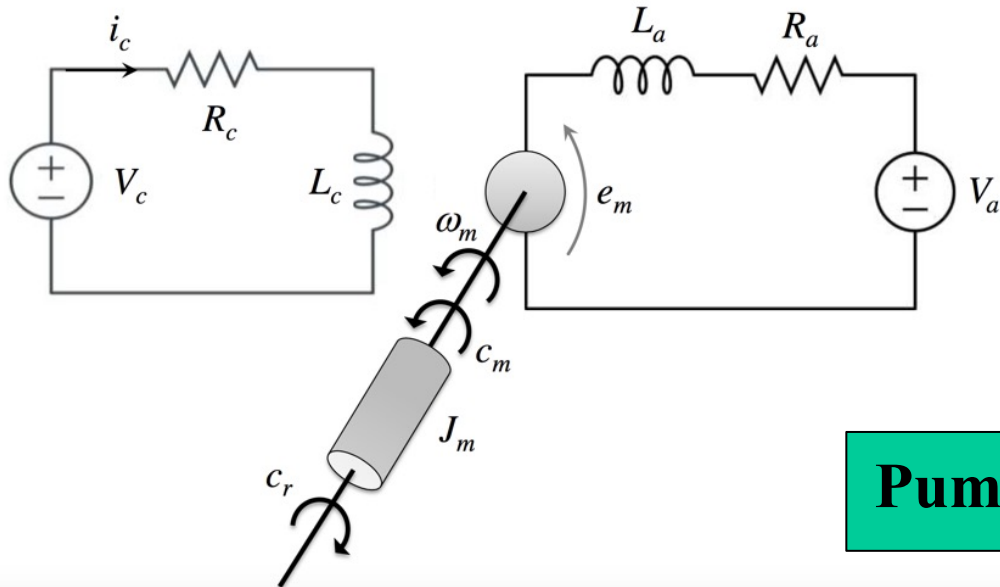
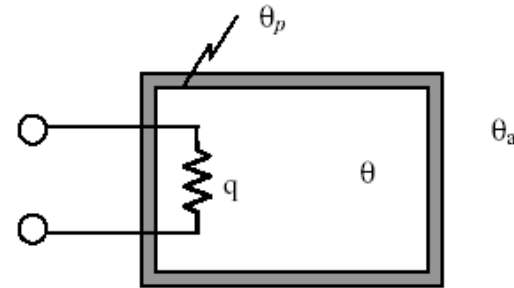
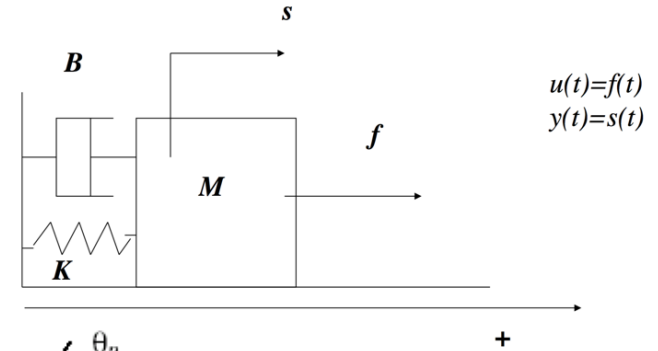
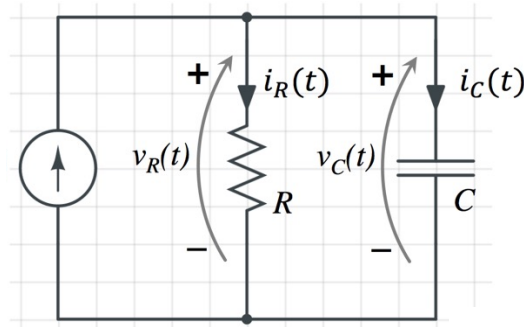
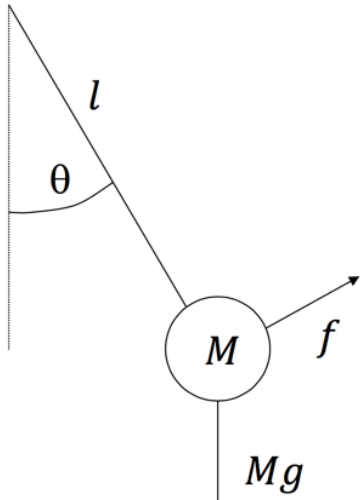
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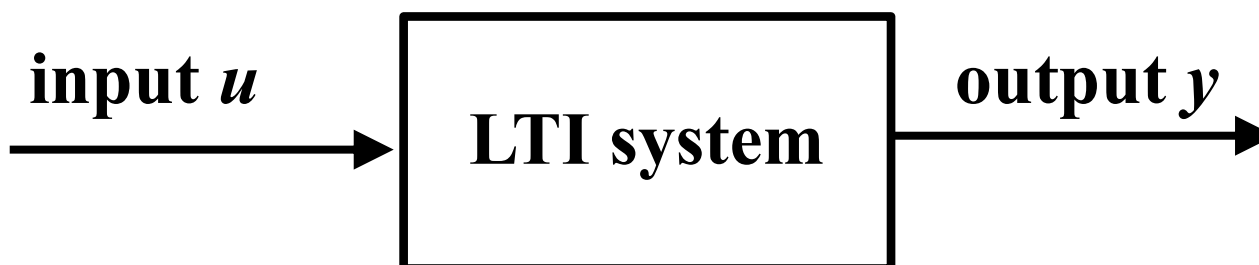
Team code: **tz3jpwb**

Examples of dynamical systems





Analysis of LTI system in the time and frequency domains



✧ *Input output representation*

✧ *State space representation*

✧ *Transfer function*

✧ *Stability analysis*

✧ *Free evolution*

✧ *Step response*

✧ *Frequency response (system as a filter, response to sinusoidal inputs)*

Analysis of LTI system in the time and frequency domains



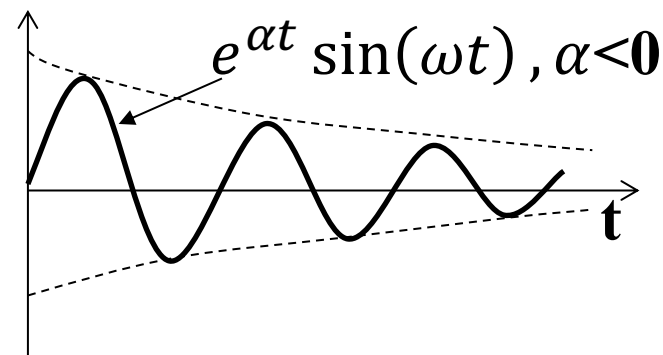
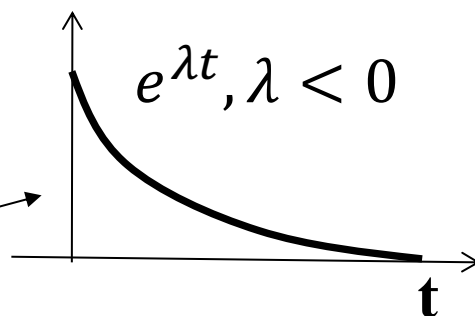
Given the input-output representation or the state space representation, evaluate

★ *Transfer function*

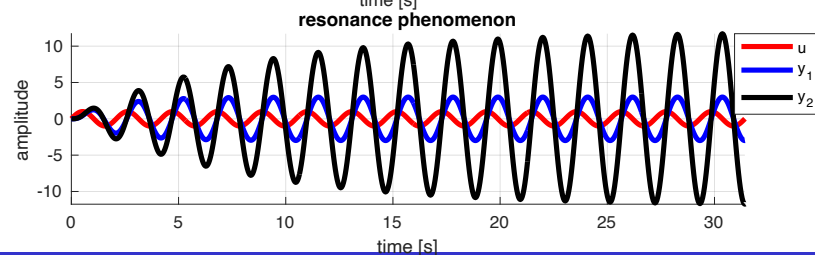
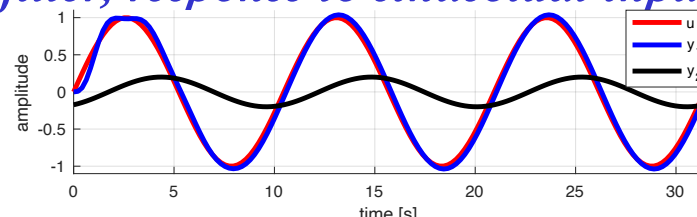
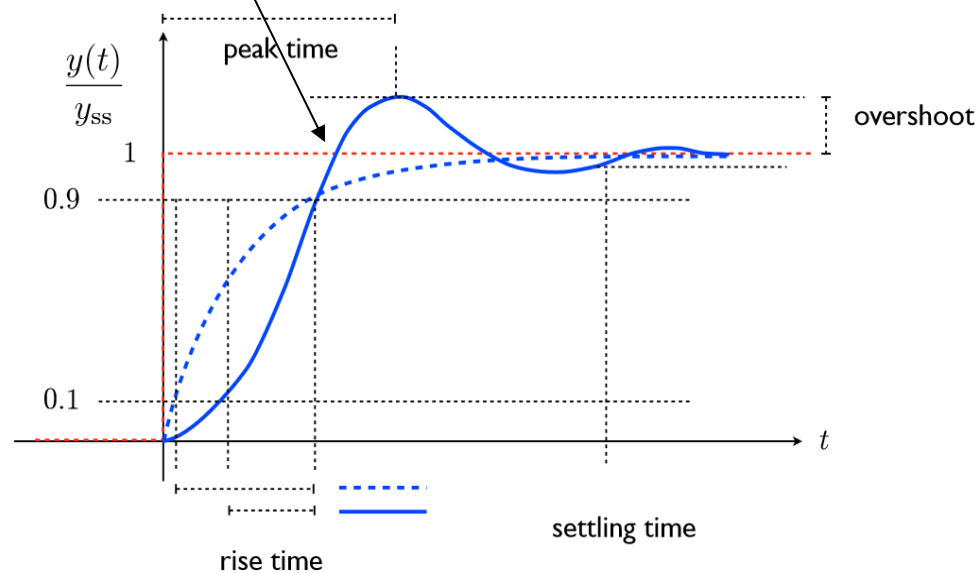
★ *Stability analysis*

★ *Free evolution*

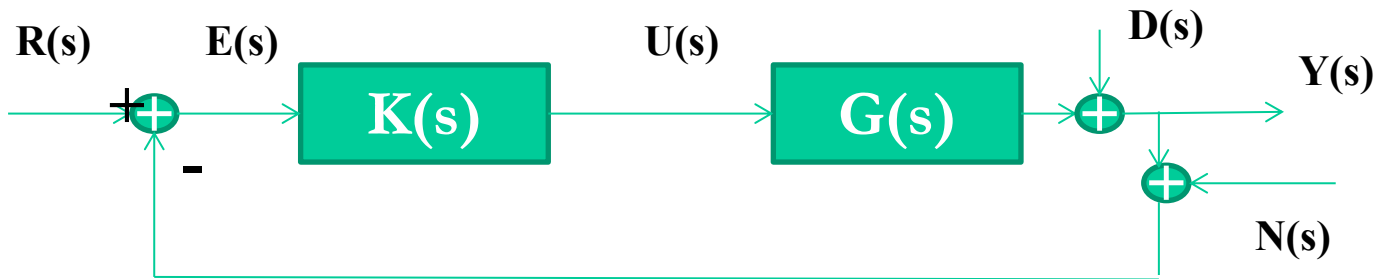
★ *Step response*



★ *Frequency response (system as a filter, response to sinusoidal inputs)*



Controller design



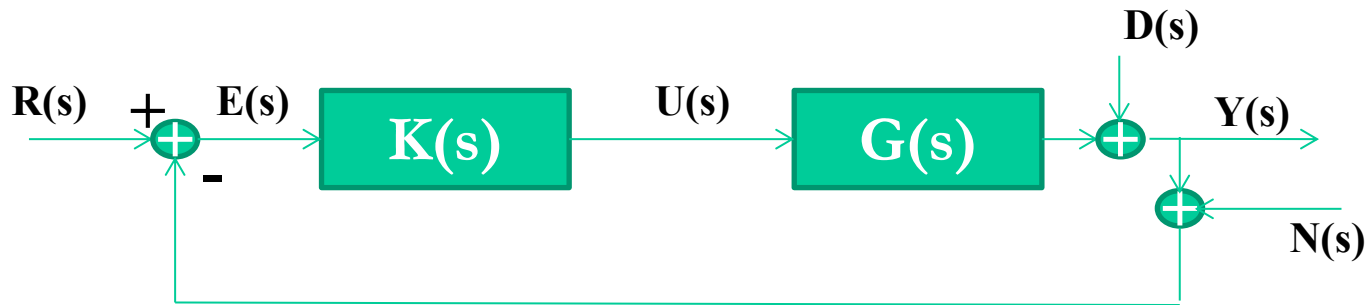
✧ *Stability*

✧ *Robust stability*

✧ *Steady-state performances*

✧ *Transient performances*

Controller design



❖ *Evaluate the performances (static and transient performances) of the closed-loop control system by employing different types of controllers $K(s)$:*

★ *Proportional (P) controller*

★ *Integral (I) controller*

★ *In general, PID controllers*

