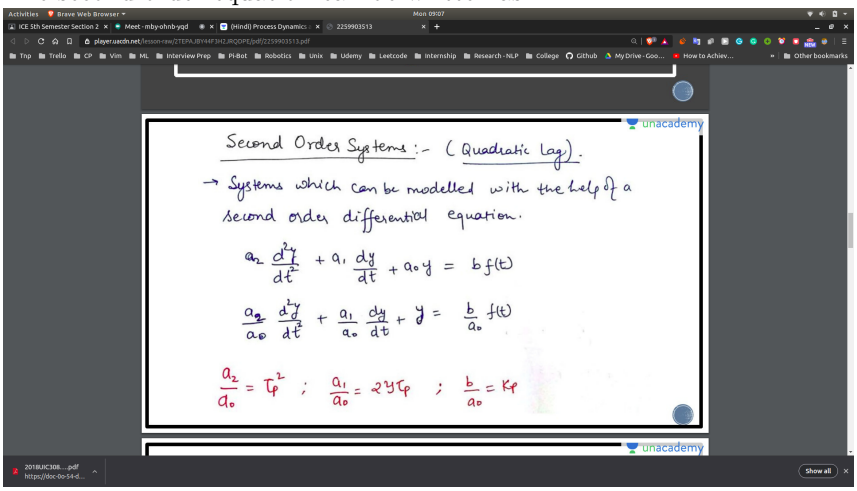
Second Order Systems

- The second order equation can be written as:
- 

- Here t_p ===> Natural Period of oscillations
- y ===> Damping Coefficient
- k_p ==> Process Gain

Converting into Laplace

- Taking Laplace Transform , we will get

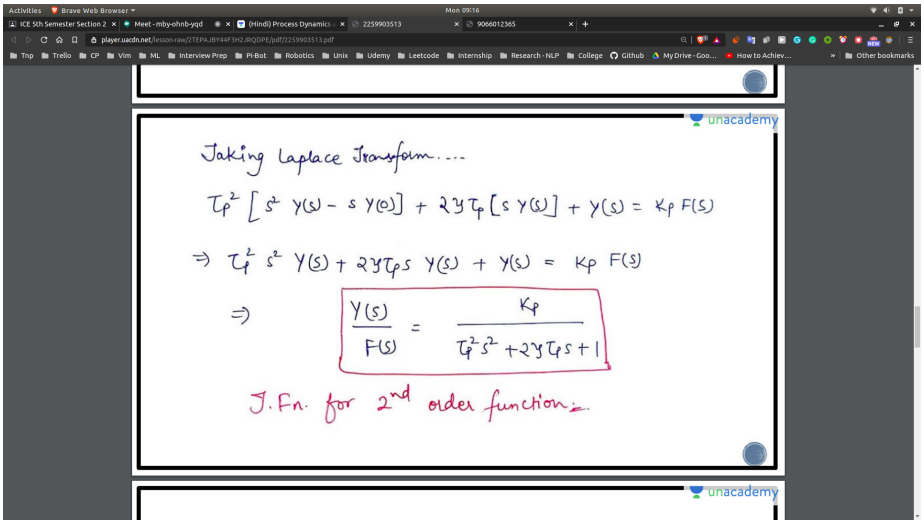


Figure 1: laplace_transfom

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- Slides in the today's folder only

How to make 2nd order using the First Order

Check in the NPTEL Examples Side for each of these Examples

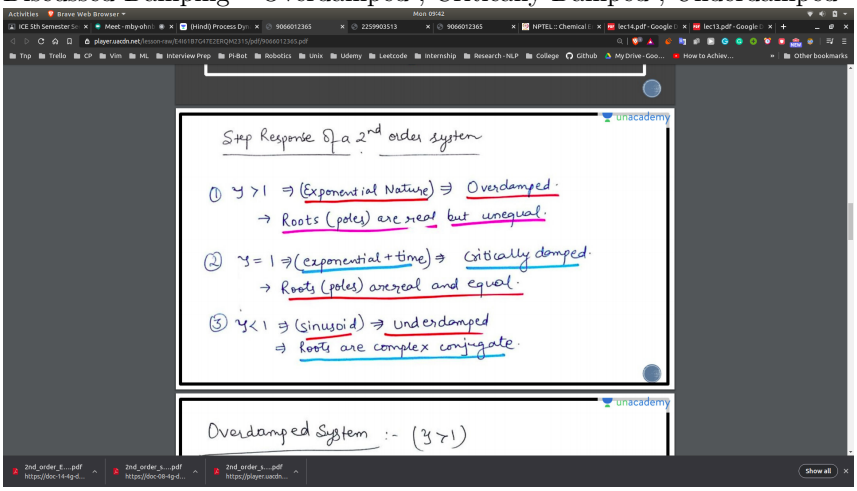
- By cascading the 1st order in series the to get the second order system
- If propotional integration is applied to the first order system it will become a second order system
- Inherent Systems
- No need to derive these equation , just know examples from high level

Examples

Check in the NPTEL Examples Side for each of these Examples

- Spring Mass Damper
- Manometer
- CSTRs in series (NPTEL Slides)
  - Also go in the calculation for this system!
  - Try to cascade and get the calculation

Damping

- Discussed Damping – Overdamped , Critically Damped , Underdamped
- 

References

- NPTEL Slides (Also in the Folder)
- Unacademy Slides (Also in the Folder)