Lecture 4
Models for Control
Part I: Overview

CHE4400
Professor Jay H. Lee
Georgia Inst. Technology

Model Requirement for Control

- For effective design of control system, we must understand the input-output (MV or disturbance to CV) dynamics.

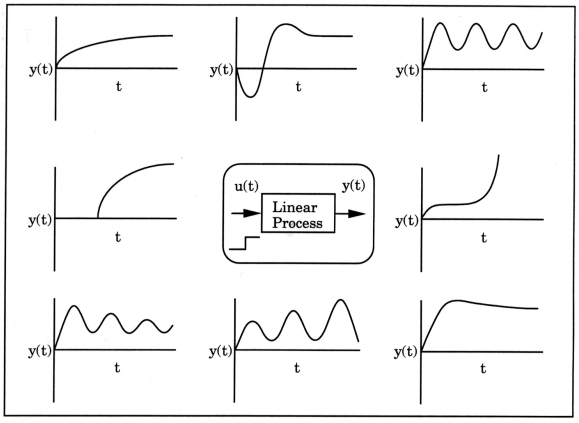
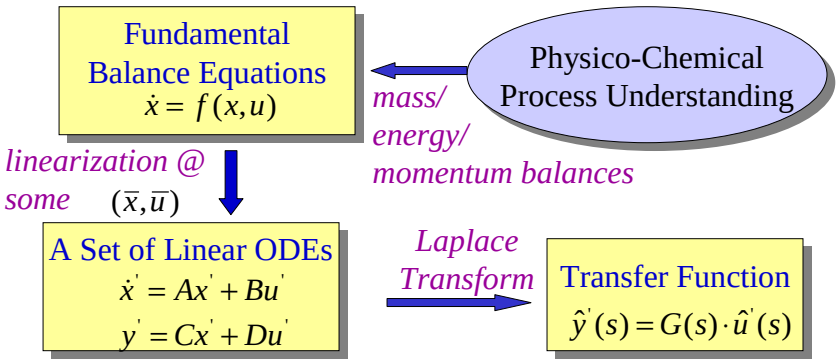


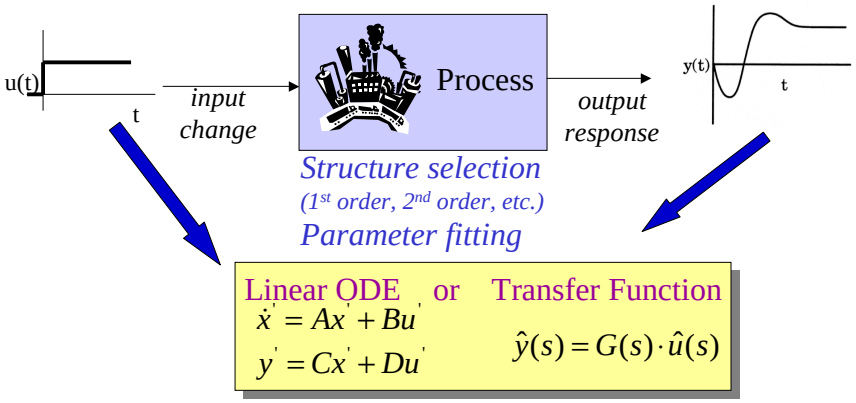
Figure 3.1. Possible responses of a linear process.

Obtaining the Model: Method 1



- There may NOT be **sufficient process understanding**.
- One may have too many equations, thus complicating the model development process (e.g., Laplace Transform) and the final model form.
- Must add sensor / control valve calibration and dynamics.

Obtaining the Model: Method 2



- Usually, the model is restricted to low-order linear differential equations (or transfer functions, equivalently).
- **Must understand how the order and parameter values of differential equation affect the response to various forcing functions (e.g., step, pulse)- *"Make Friends w/ Transfer Fcn."***