

Dynamics Review - Modeling Assumptions

ME3050 - Dynamics Modeling and Controls
Tennessee Technological University

May 29, 2020

Topic 3 - Modeling Assumptions

Topic 3 - Modeling Assumptions

- Simplify Complex Systems
- Increase Complexity Incrementally
- Solid Mechanics and Dynamics
- Thermal and Fluid Systems
- Electrical and Power Systems

Simplify Complex Systems

Increase Complexity Incrementally
Solid Mechanics and Dynamics
Thermal and Fluid Systems
Electrical and Power Systems

Simplify Complex Systems

Engineers encounter complex systems and these systems are difficult to model. Do we run away? No!

Increase Complexity Incrementally

You cannot solve a complex problem in your head or all at once.

Engineers model and analyse complex systems one piece at a time on a component level.

In system dynamics we study the system behavior by modeling the interactions and responses of the different components involved.

Solid Mechanics and Dynamics

- Frictionless Sliding
- Pure Roll - No Slip
- Planar Motion
-

Thermal and Fluid Systems

- Viscous Boundary Layer
- Insulated or Constant Flux Boundaries
-

Electrical and Power Systems

- Zero Heat Loss or Generation
- Zero Resistance Conductors
-