

Module 1 - Introduction

ME3050 - Dynamic Modeling and Controls

Mechanical Engineering

Tennessee Technological University

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

Engineers encounter complex systems and these systems are difficult to model and analyze. Analysis requires multiple steps or processes and modeling requires iteration. Typically, you cannot solve these complex problems in your head alone.



Image: [Wikipedia](#)

Increase Complexity Incrementally

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

In system dynamics we study the behavior of complex systems by modeling the iterations and responses of the different components involved. Our models will start simple and build in complexity as the theory is presented.

Solid Mechanics and Dynamics

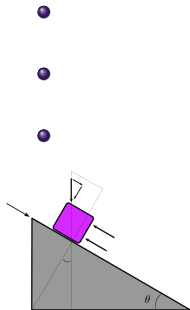
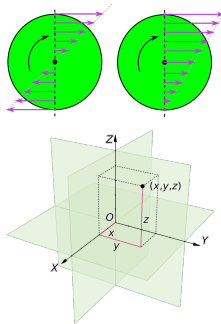


Image: TH



Images: TH, [Wikipedia](#)

Thermal and Fluid Systems



Electrical and Power Systems

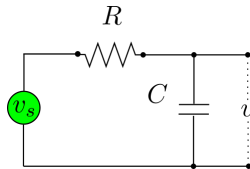


Image: TH