

# Lecture Module - Automatic Control

ME3050 - Dynamics Modeling and Controls

Mechanical Engineering

Tennessee Technological University

## Automatic Control

## Lecture Module - Automatic Control

- Topic 1 - Introduction to Control Systems
- Topic 2 - Control of First Order Plants
- Topic 3 - Control of Second Order Plants
- Topic 4 - Application and Implementation

# Topic 1 - Introduction to Control Systems

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## Control System Examples:

- Thermal Control - HVAC - 3D Printing
- Vehicle Control - Cruise - ACC
- Precision Motion Control - Robotics - Automation

**Goal:** cause system output to go to specified state

**Strategy:**

## Introduction to Control Systems

Control of First Order Plants

Control of Second Order Plants

Application and Implementation

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Application and Implementation

# Amplitude Ratio

# References

- System Dynamics, Palm III, Third Edition - Chapter 10 - Introduction to Feedback Control Systems

## Topic 2 - Control of First Order Plants

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# Harmonic Input Function



























## Topic 3 - Control of Second Order Plants

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## Topic 3 - Application and Implementation

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