# UNIT-2

# (Lecture-1)

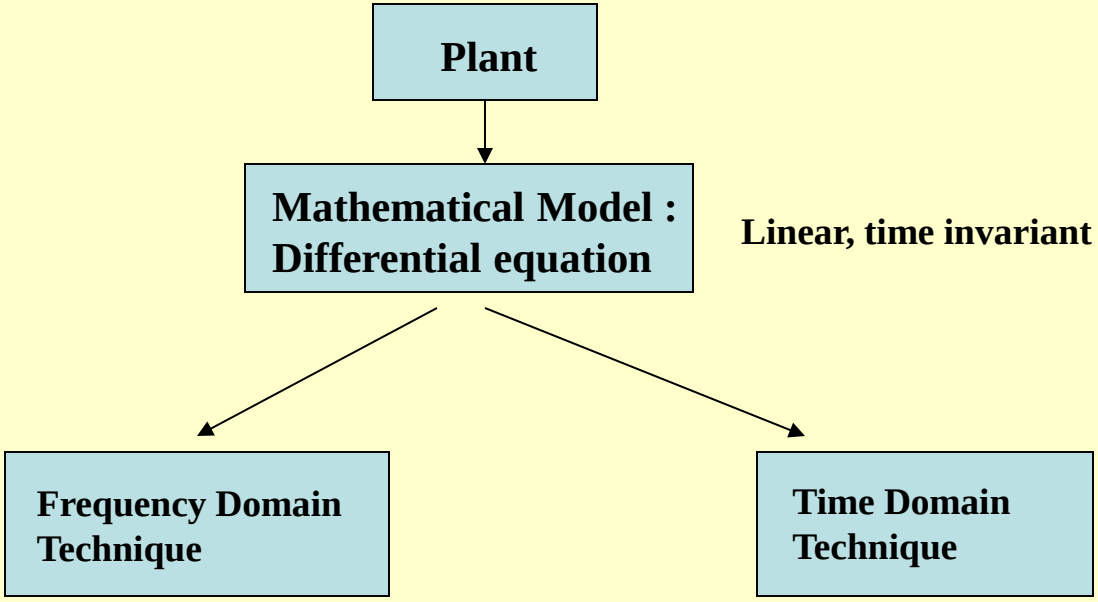
## State-Variable Analysis

# Objectives

**How to find mathematical model, called a state-space representation, for a linear, time-invariant system**

**How to convert between transfer function and state space models**

**How to linearize a state space representation**


Plant
Mathematical Model :
Differential equation
Linear, time invariant
Frequency Domain
Technique
Time Domain
Technique

# Two approaches for analysis and design of control system

1. **Classical Technique or Frequency Domain Technique**

2. **Modern Technique or Time Domain Technique**

1. **Select a particular subset of all possible system variables, and call *state variables*.**

2. **For *n*th-order, write *n simultaneous, first-order differential equations* in terms of the state variables (*state equations*).**

3. **If we know the initial condition of all of the state variables at as well as the system input for, we can solve the equations**