SIGNALS AND SYSTEMS

Block Diagram Representation

- Graphical representation of a system
- Represent how input signals are transformed into output signals through various system components

Key Components in Block Diagrams of LTI Systems

- Input/Output Signals
- Summing Junction
- Gain Blocks
- Differentiators and Integrators
- System Blocks (Transfer Function)

Basic Block Diagram Representation

First-Order LTI System:

Consider a first-order system described by the differential equation:

$$\frac{dy(t)}{dt} + ay(t) = bx(t)$$

- Summer
- Gain block
- Integrator

Feedback Systems

- In many control systems, the output is fed back into the system to adjust the input.
- In such feedback systems, block diagrams show the feedback loop explicitly.

Example: Negative Feedback System

Applications of Block Diagrams

- Control Systems
- Signal Processing
- Communication Systems
- Electrical Circuits

Thank you