

EEE 321

Signals and Systems

Ankara University

Faculty of Engineering

Electrical and Electronics Engineering Department

Continuous-Time and Discrete-Time Systems

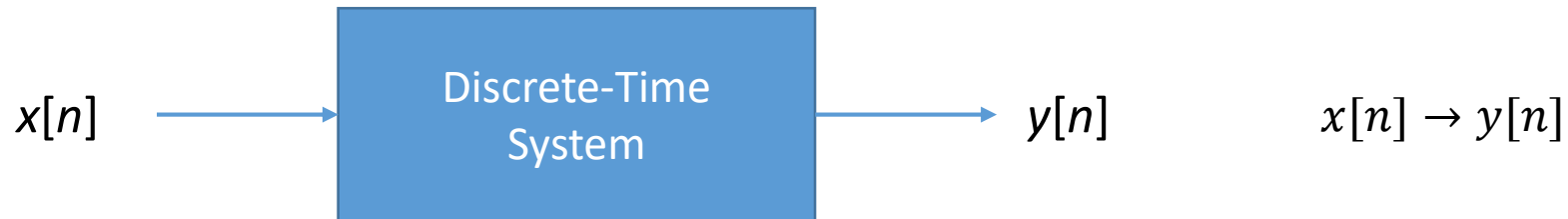
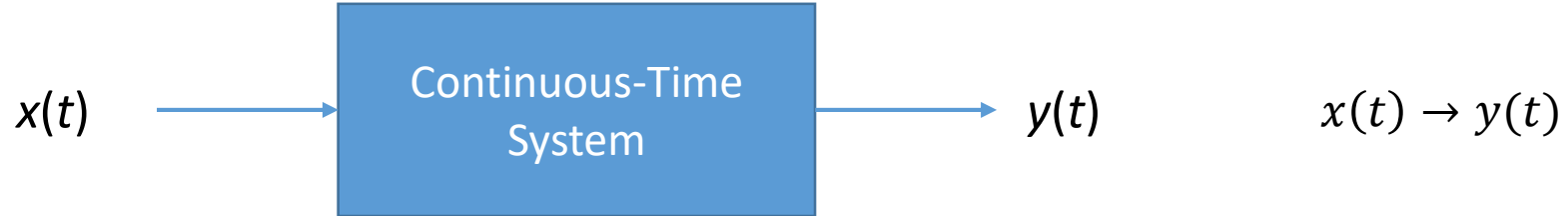
EEE321 Signals and Systems

Lecture 6

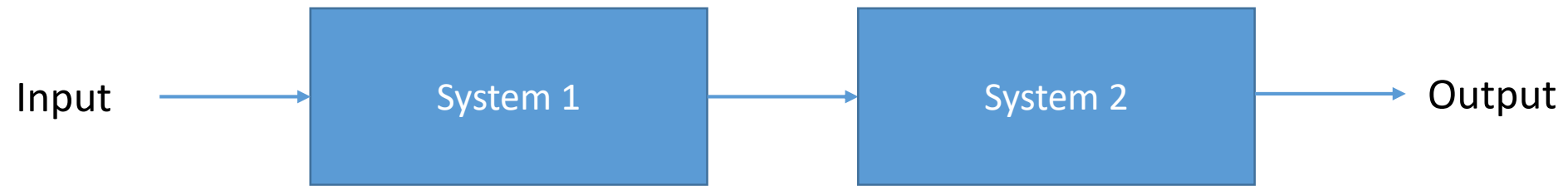
Agenda

- Systems
- System connections
- Basic system properties

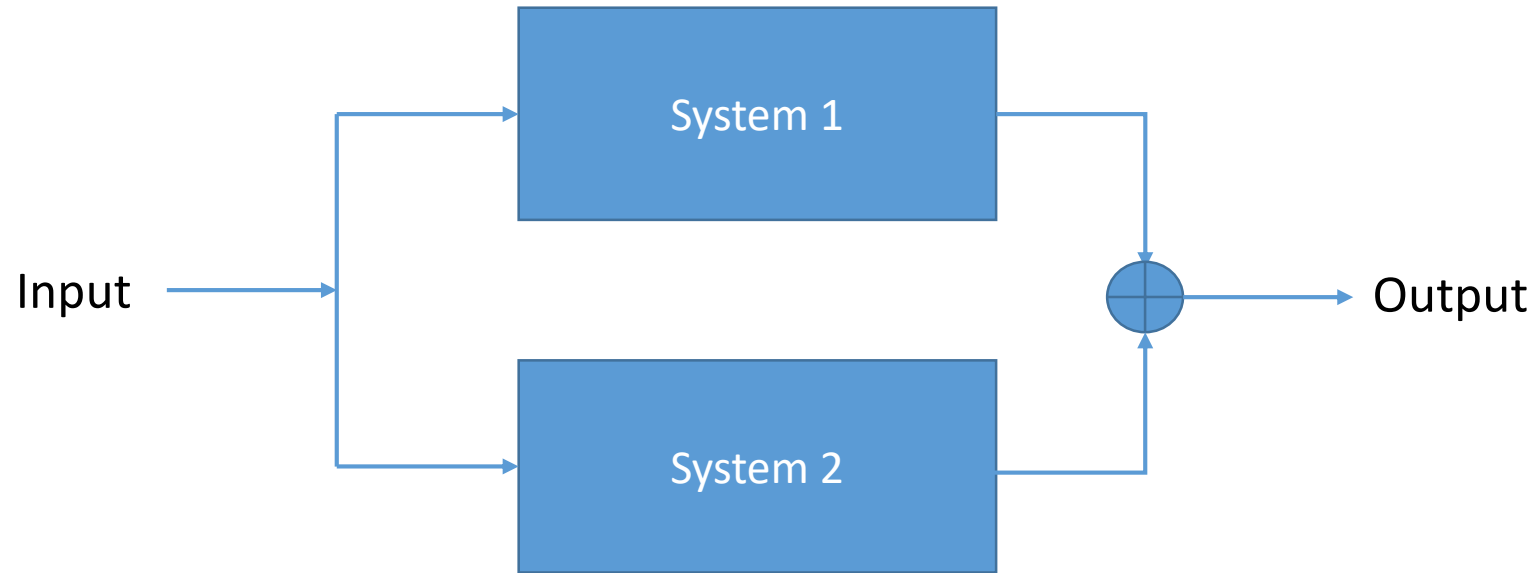
Continuous-Time and Discrete-Time Systems



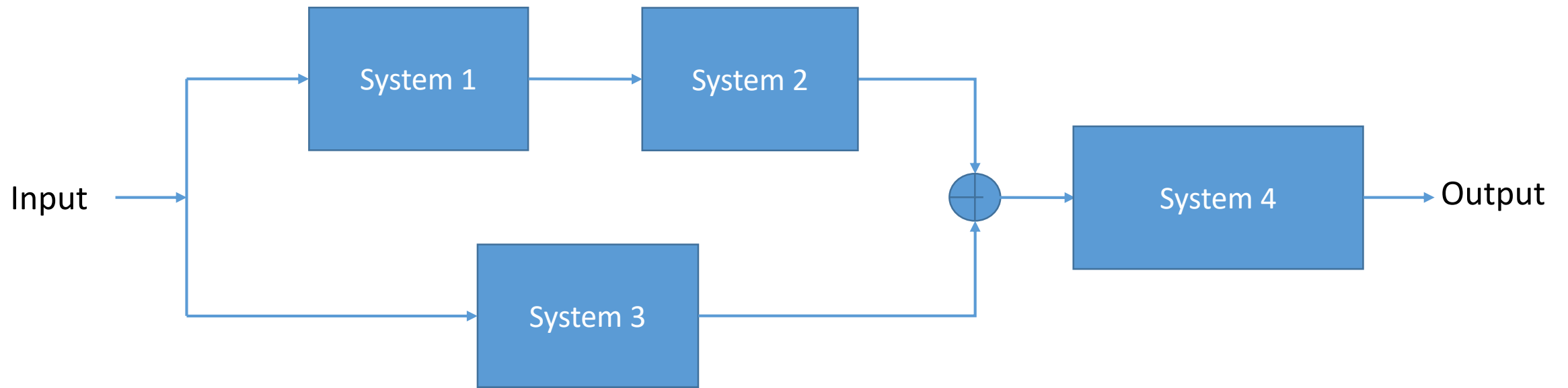
Interconnection of Systems



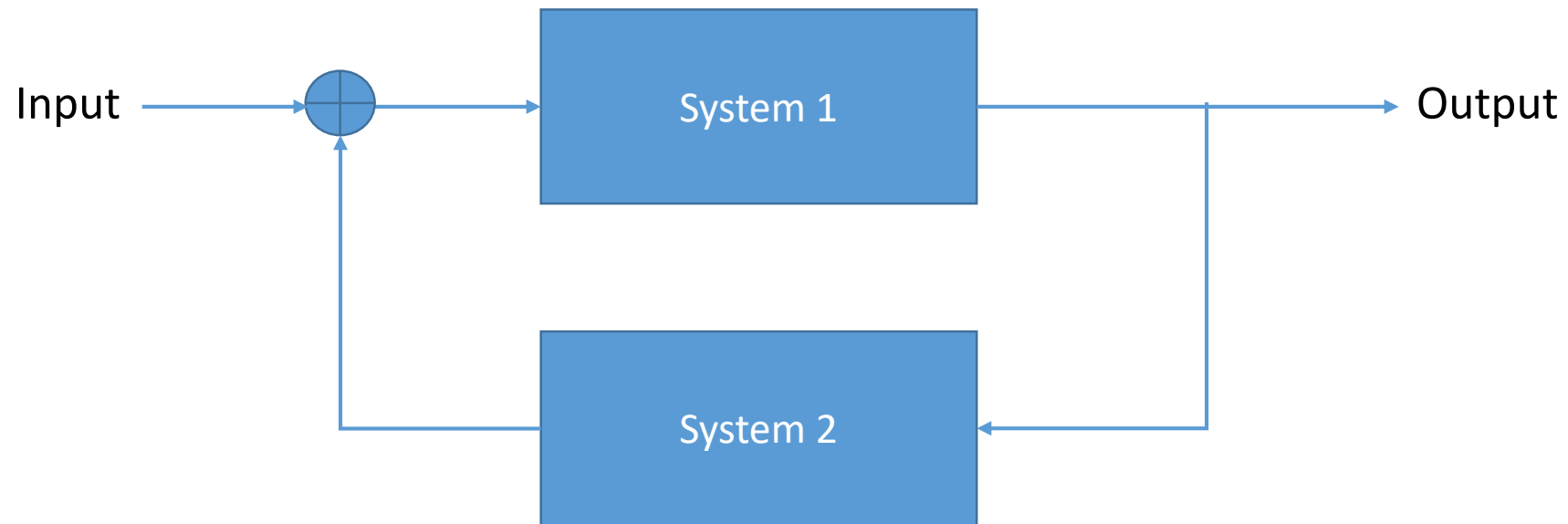
Series (Cascade) Interconnection



Parallel Interconnection



Series-Parallel Interconnection



Feedback Interconnection

Basic System Properties

- Systems with and without Memory

Memoryless System: Output given at a time depends only on the input at the same time.
If not, system is with memory.

- Invertibility of Systems

A system is invertible if distinct inputs lead to distinct outputs. Then there is inverse system.

- Causality

A system is causal if output at any time is dependent only on the input values at the present and past time. It does not depend on future values of the input.

- Stability

Bounded input \rightarrow Bounded Output

- Time Invariance

Time shift in the input results in identical time shift in the output.

- Linearity

Weighted sum of input signals results in weighted sum of the responses of the system to each of input signals.

References

- Signals and Systems, 2nd Edition, Oppenheim, Willsky, Nawab