

King Saud University
College of Engineering
Electrical Engineering Department

EE 329: Signals and Systems Analysis for SE Department

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Office 2C29

Office hours: TBA

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Textbooks:

1. A.V. Oppenheim, A. S. Willsky, and S. H. Nawab, "Signals & Systems", Prentice-Hall, 1997,
2. S. Haykin and B. V. Veen, "Signals and Systems", John Wiley & Sons, Inc., 1999.
3. G. E. Carlson, "Signal and Linear System Analysis with MATLAB", John Wiley & Sons, Inc., 1998.

Course Outline:

Topic	Chapters
Signals and Systems	Ch 1
LTI systems	Ch. 2
Fourier Series for Periodic Signals	Ch. 3
The Continuous time Fourier Transform	Ch. 4
The Discrete time Fourier Transform	Ch. 5

Grading system:

15 % Home works

15 % Each Mid-Term examination

40 % Final examination

Midterms Exams

1st Midterm: Saturday 03/02/1424

2nd Midterm: Monday 4/3/1424

3rd Midterm: Monday 18/3/1424

EE 329 Signals and systems for SE

Course Schedule, Academic Year 1423/1424

الأسبوع	الموضوعات
1	Definition of a signal. Definition of a system. Continuous-time signals and systems. Discrete-time signals and systems. Analysis versus synthesis, and applications.
2	Continuous-Time (CT) and Discrete-Time (DT) Signals Classifications of CT and DT signals Deterministic signals. Random signals. Periodic signals. Energy and power signals. Even and odd signals.
3	Transformations of the independent variable of CT and DT signals. Time shifting. Reflection. Time scaling.
4	Basic operations on CT and DT signals Convolution The convolution integral. The convolution sum.
5	Properties of convolution The commutative property. The distributive property. The associative property. Correlation Cross-correlation function. Autocorrelation function.
6	Properties of correlation functions. Relationship between convolution and correlation. Fourier series (FS) representations of CT and DT periodic signals Linear combinations of harmonically related complex exponentials. Determination of the FS representation.
7	Fourier transform (FT) representations of CT and DT signals Development of the FT representation.
8	Convergence of the FT. The FT for periodic signals Properties of the Fourier representations. Linearity. Conjugation and conjugate symmetry. Time and frequency shifting, and scaling Differentiation and integration. Differencing and summation. Convolution. Multiplication. Duality.
9	Differencing and summation.

	<p>Convolution. Multiplication. Parseval's relation. Duality.] CT and DT Systems Interconnections of systems.</p>
10	<p>Basic system properties Systems with and without memory. Causal and noncausal systems. Stable and nonstable systems.</p>
11	<p>Linear and nonlinear systems. Time invariant and time varying systems. Invertibility and inverse systems. Linear time-invariant (LTI) systems</p>
12	<p>The response of LTI systems to an arbitrary input. The impulse response. Development of the convolution sum. Development of the convolution integral. Relationship between step and impulse responses.</p>
13	<p>Properties of LTI Systems LTI systems interconnected in cascade and parallel LTI systems with and without memory. Invertibility of LTI systems. Causality for LTI systems. Stability for LTI systems.</p>
14	<p>The response of LTI systems to a complex exponential The frequency response. System response to a periodic signal. Filtering. DT processing of CT signals. The sampling theorem. Basic system components. Systems characterized by linear constant-coefficient and difference equations</p>