ECE 223 Signals & Systems II

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Key Concepts from Last Time

- DT complex sinusoidal harmonics are not distinct
- Any DT periodic signal can be exactly represented as a sum of $N$ complex sinusoidal harmonics
- The Fourier series analysis equation tells us how to calculate the coefficients $X[k]$.
- The synthesis equation tells us how the signal can be reconstructed from $X[k]$.
- The coefficients are periodic with the same fundamental period as the signal: $X[k] = X[k + N]$.
- The analysis and synthesis equations are both finite sums.
- This means they can be calculated almost exactly with computers.

Homework Assignment 2

- Reading
  - Required: Chapter 3: Sections 5–6
- Required Problems (must turn in)
  - Ch. 3: 7, 9, 50e, 50f, 51e, 51f
- Recommended Problems (don’t turn in)
  - Ch. 3: 8, 10, 50a-c, 51a-c
- Required problems due on Monday, April 11
- Assignment is also posted on the class web site
- Solutions will be posted soon

Lecture Overview

Last Time

- DT harmonics
- DT Fourier series
  - Derivation
  - Relevance
  - Example

This Time

- CT Fourier series
  - Derivation
  - Relevance
  - Example