ECE 260 (Continuous-Time Signals and Systems) Video Lectures

1   Introduction

The following is a link to the full video:
  ◇ https://youtu.be/jApBXeFQTMk [duration: 00:23:12]
The following are links to particular offsets within the video:
  ◇ 00:00: [intro] Unit: Introduction
  ◇ 00:18: [intro] Signals
  ◇ 01:41: [intro] Classification of Signals
  ◇ 06:01: [intro] Graphical Representation of Signals
  ◇ 07:09: [intro] Systems
  ◇ 07:44: [intro] Classification of Systems
  ◇ 09:19: [intro] Signal Processing Systems
  ◇ 11:50: [intro] Communication Systems
  ◇ 14:01: [intro] Control Systems
  ◇ 17:52: [intro] Why Study Signals and Systems?
  ◇ 20:03: [intro] System Failure Example: Tacoma Narrows Bridge
  ◇ 22:41: [intro] System Failure Example: Tacoma Narrows Bridge (Continued)

2   Complex Analysis

The following is a link to the full video:
  ◇ https://youtu.be/8_KKaTEUZB0 [duration: 00:45:42]
The following are links to particular offsets within the video:
  ◇ 00:00: [complex] Unit: Complex Analysis
  ◇ 00:26: [complex] Complex Numbers
  ◇ 01:45: [complex] Complex Numbers (Continued)
  ◇ 03:07: [complex] Geometric Interpretation of Cartesian and Polar Forms
  ◇ 03:58: [complex] The arctan Function
  ◇ 07:14: [complex] The atan2 Function
  ◇ 08:32: [complex] Conversion Between Cartesian and Polar Form
  ◇ 09:46: [complex] Properties of Complex Numbers
  ◇ 11:02: [complex] Conjugation
  ◇ 12:08: [complex] Properties of Conjugation
  ◇ 13:37: [complex] Addition
  ◇ 14:38: [complex] Multiplication
  ◇ 15:44: [complex] Division
  ◇ 17:47: [complex] Properties of the Magnitude and Argument
  ◇ 18:56: [complex] Euler's Relation and De Moivre's Theorem
  ◇ 20:06: [complex] Roots of Complex Numbers
  ◇ 21:05: [complex] Quadratic Formula
  ◇ 22:04: [complex] Complex Functions
  ◇ 23:35: [complex] Continuity
  ◇ 25:11: [complex] Differentiability

⋄ 26:40: [complex] Open Disks
⋄ 27:53: [complex] Analyticity
⋄ 29:51: [complex] Example A.10
⋄ 30:27: [complex] Example A.11
⋄ 31:25: [complex] Zeros and Singularities
⋄ 35:20: [complex] Zeros and Poles of a Rational Function
⋄ 39:00: [complex] Example A.12

3   Preliminaries — Introduction

The following is a link to the full video:

⋄ https://youtu.be/0950-nR1KqQ [duration: 00:00:26]

The following are links to particular offsets within the video:

⋄ 00:00: [prelim] Unit: Preliminaries

4   Preliminaries — Functions, Sequences, System Operators, and Transforms

The following is a link to the full video:

⋄ https://youtu.be/LREmWSf5v3k [duration: 00:33:33]

The following are links to particular offsets within the video:

⋄ 00:00: [prelim] Section: Functions, Sequences, System Operators, and Transforms
⋄ 00:11: [prelim] Sets
⋄ 01:07: [prelim] Notation for Intervals on the Real Line
⋄ 03:41: [prelim] Mappings
⋄ 06:19: [prelim] Functions
⋄ 09:59: [prelim] Example 2.2
⋄ 15:58: [prelim] Sequences
⋄ 19:42: [prelim] System Operators
⋄ 22:48: [prelim] Remarks on Operator Notation for CT Systems
⋄ 28:21: [prelim] Example 2.6
⋄ 30:08: [prelim] Example 2.7
⋄ 31:38: [prelim] Transforms
⋄ 32:49: [prelim] Examples of Transforms

5   Preliminaries — Signal Properties

The following is a link to the full video:

⋄ https://youtu.be/iWDh_nhVEII [duration: 00:08:59]

The following are links to particular offsets within the video:

⋄ 00:00: [prelim] Section: Properties of Signals
⋄ 00:10: [prelim] Even Symmetry
⋄ 01:53: [prelim] Odd Symmetry
⋄ 03:59: [prelim] Conjugate Symmetry
⋄ 05:04: [prelim] Periodicity
⋄ 06:46: [prelim] Periodicity (Continued 1)
⋄ 07:49: [prelim] Periodicity (Continued 2)

6 CT Signals and Systems — Introduction

The following is a link to the full video:

⋄ https://youtu.be/9wJGqOaEbWg [duration: 00:00:23]

The following are links to particular offsets within the video:

⋄ 00:00: [ctsigsys] Unit: Continuous-Time (CT) Signals and Systems

7 CT Signals and Systems — Independent/Dependent-Variable Transformations

The following is a link to the full video:

⋄ https://youtu.be/dtfMWDJPqEs [duration: 00:38:00]

The following are links to particular offsets within the video:

⋄ 00:00: [ctsigsys] Section: Independent- and Dependent-Variable Transformations
⋄ 00:18: [ctsigsys] Time Shifting (Translation)
⋄ 01:24: [ctsigsys] Time Shifting (Translation): Example
⋄ 03:17: [ctsigsys] Time Reversal (Reflection)
⋄ 04:45: [ctsigsys] Time Compression/Expansion (Dilation)
⋄ 06:02: [ctsigsys] Time Compression/Expansion (Dilation): Example
⋄ 08:04: [ctsigsys] Time Scaling (Dilation/Reflection)
⋄ 10:21: [ctsigsys] Time Scaling (Dilation/Reflection): Example
⋄ 11:57: [ctsigsys] Combined Time Scaling and Time Shifting
⋄ 19:36: [ctsigsys] Exercise 3.3
⋄ 25:55: [ctsigsys] Combined Time Scaling and Time Shifting: Example
⋄ 28:26: [ctsigsys] Two Perspectives on Independent-Variable Transformations
⋄ 31:14: [ctsigsys] Demonstration: Two Views of Time-Shifting Transformations
⋄ 33:26: [ctsigsys] Amplitude Scaling
⋄ 35:19: [ctsigsys] Amplitude Shifting
⋄ 36:11: [ctsigsys] Combined Amplitude Scaling and Amplitude Shifting

8 CT Signals and Systems — Function Properties

The following is a link to the full video:

⋄ https://youtu.be/PRD3WoWrxa4 [duration: 00:26:30]

The following are links to particular offsets within the video:

⋄ 00:00: [ctsigsys] Section: Properties of Functions
⋄ 00:11: [ctsigsys] Symmetry and Addition/Multiplication
⋄ 02:28: [ctsigsys] Decomposition of a Function into Even and Odd Parts
⋄ 04:48: [ctsigsys] Theorem 3.1
⋄ 08:17: [ctsigsys] Sum of Periodic Functions
⋄ 11:50: [ctsigsys] Example 3.2
⋄ 14:00: [ctsigsys] Example 3.4
⋄ 17:17: [ctsigsys] Right-Sided Functions
⋄ 19:49: [ctsigsys] Left-Sided Functions
⋄ 21:54: [ctsigsys] Finite-Duration and Two-Sided Functions
⋄ 23:32: [ctsigsys] Bounded Functions
⋄ 25:14: [ctsigsys] Energy and Power of a Function

9 CT Signals and Systems — Elementary Functions

The following is a link to the full video:
- ⋄ https://youtu.be/qVurOxA8oYM [duration: 00:51:59]

The following are links to particular offsets within the video:
- ⋄ 00:00: [ctsigsys] Section: Elementary Functions
- ⋄ 00:17: [ctsigsys] Real Sinusoidal Functions
- ⋄ 00:49: [ctsigsys] Complex Exponential Functions
- ⋄ 01:23: [ctsigsys] Real Exponential Functions
- ⋄ 02:35: [ctsigsys] Complex Sinusoidal Functions
- ⋄ 03:49: [ctsigsys] Complex Sinusoidal Functions (Continued)
- ⋄ 04:15: [ctsigsys] Plots of Complex Sinusoidal Functions
- ⋄ 05:14: [ctsigsys] General Complex Exponential Functions
- ⋄ 07:00: [ctsigsys] General Complex Exponential Functions (Continued)
- ⋄ 07:44: [ctsigsys] Unit-Step Function
- ⋄ 09:08: [ctsigsys] Signum Function
- ⋄ 09:50: [ctsigsys] Rectangular Function
- ⋄ 10:59: [ctsigsys] Cardinal Sine Function
- ⋄ 12:55: [ctsigsys] Unit-Impulse Function
- ⋄ 17:25: [ctsigsys] Unit-Impulse Function as a Limit
- ⋄ 19:55: [ctsigsys] Properties of the Unit-Impulse Function
- ⋄ 22:17: [ctsigsys] Figure: Graphical Interpretation of Equivalence Property
- ⋄ 24:23: [ctsigsys] Example 3.8
- ⋄ 25:55: [ctsigsys] Example 3.9
- ⋄ 29:34: [ctsigsys] Example 3.10
- ⋄ 36:30: [ctsigsys] Representing a Rectangular Pulse (Using Unit-Step Functions)
- ⋄ 39:08: [ctsigsys] Example 3.11
- ⋄ 43:06: [ctsigsys] Representing Functions Using Unit-Step Functions
- ⋄ 44:21: [ctsigsys] Example 3.12

10 CT Signals and Systems — Systems

The following is a link to the full video:
- ⋄ https://youtu.be/InFEzaTvC1o [duration: 00:05:40]

The following are links to particular offsets within the video:
- ⋄ 00:00: [ctsigsys] Section: Continuous-Time (CT) Systems
- ⋄ 00:13: [ctsigsys] CT Systems
- ⋄ 02:36: [ctsigsys] Block Diagram Representations
- ⋄ 02:57: [ctsigsys] Interconnection of Systems

11 CT Signals and Systems — System Properties

The following is a link to the full video:
- ⋄ https://youtu.be/C53uS3lkeJQ [duration: 01:14:19]

The following are links to particular offsets within the video:
- ⋄ 00:00: [ctsigsys] Section: Properties of (CT) Systems
- ⋄ 00:11: [ctsigsys] Memory
- ⋄ 02:45: [ctsigsys] Memory (Continued)
- ⋄ 04:42: [ctsigsys] Example 3.15
- ⋄ 06:09: [ctsigsys] Example 3.16
- ⋄ 08:02: [ctsigsys] Causality

- ⋄ 11:14: [ctsigsys] Causality (Continued)
- ⋄ 12:58: [ctsigsys] Example 3.19
- ⋄ 14:36: [ctsigsys] Example 3.20
- ⋄ 16:28: [ctsigsys] Invertibility
- ⋄ 20:53: [ctsigsys] Invertibility (Continued)
- ⋄ 22:39: [ctsigsys] Example 3.23
- ⋄ 27:28: [ctsigsys] Example 3.24
- ⋄ 31:22: [ctsigsys] Bounded-Input Bounded-Output (BIBO) Stability
- ⋄ 34:57: [ctsigsys] Example 3.27
- ⋄ 37:46: [ctsigsys] Example 3.28
- ⋄ 40:37: [ctsigsys] Time Invariance (TI)
- ⋄ 43:30: [ctsigsys] Time Invariance (Continued)
- ⋄ 44:59: [ctsigsys] Example 3.32
- ⋄ 47:28: [ctsigsys] Example 3.33
- ⋄ 51:27: [ctsigsys] Additivity, Homogeneity, and Linearity
- ⋄ 56:03: [ctsigsys] Additivity, Homogeneity, and Linearity (Continued 1)
- ⋄ 58:38: [ctsigsys] Additivity, Homogeneity, and Linearity (Continued 2)
- ⋄ 01:00:21: [ctsigsys] Example 3.35
- ⋄ 01:03:58: [ctsigsys] Example 3.36
- ⋄ 01:08:59: [ctsigsys] Eigenfunctions of Systems
- ⋄ 01:10:44: [ctsigsys] Example 3.41

12 CT LTI Systems — Introduction

The following is a link to the full video:
- ⋄ https://youtu.be/oOl2SX3Fzw8 [duration: 00:02:24]

The following are links to particular offsets within the video:
- ⋄ 00:00: [ctltisys] Unit: Continuous-Time Linear Time-Invariant (LTI) Systems
- ⋄ 00:52: [ctltisys] Why Linear Time-Invariant (LTI) Systems?

13 CT LTI Systems — Convolution

The following is a link to the full video:
- ⋄ https://youtu.be/q2n6l3-gi_c [duration: 00:57:49]

The following are links to particular offsets within the video:
- ⋄ 00:00: [ctltisys] Section: Convolution
- ⋄ 00:15: [ctltisys] CT Convolution
- ⋄ 03:32: [ctltisys] Example X.4.1
- ⋄ 10:46: [ctltisys] Practical Convolution Computation
- ⋄ 14:25: [ctltisys] Example 4.1
- ⋄ 34:26: [ctltisys] Exercise 4.18(u)
- ⋄ 46:21: [ctltisys] Properties of Convolution
- ⋄ 49:03: [ctltisys] Theorem 4.1
- ⋄ 56:06: [ctltisys] Representation of Functions Using Impulses

14 CT LTI Systems — Convolution and LTI Systems

The following is a link to the full video:
- ⋄ https://youtu.be/fnH51-gRiqg [duration: 00:25:29]

The following are links to particular offsets within the video:

- ◇ 00:00: [ctltisys] Section: Convolution and LTI Systems
- ◇ 00:19: [ctltisys] Impulse Response
- ◇ 03:03: [ctltisys] Theorem 4.5
- ◇ 07:14: [ctltisys] Example 4.5
- ◇ 10:52: [ctltisys] Step Response
- ◇ 12:52: [ctltisys] Block Diagram Representation of LTI Systems
- ◇ 13:31: [ctltisys] Interconnection of LTI Systems
- ◇ 16:31: [ctltisys] Example 4.7

15 CT LTI Systems — Properties of LTI Systems

The following is a link to the full video:
- ◇ https://youtu.be/cOhpZyxyDW8 [duration: 00:46:04]

The following are links to particular offsets within the video:
- ◇ 00:00: [ctltisys] Section: Properties of LTI Systems
- ◇ 00:35: [ctltisys] Memory
- ◇ 04:03: [ctltisys] Example 4.8
- ◇ 06:21: [ctltisys] Example 4.9
- ◇ 07:14: [ctltisys] Causality
- ◇ 09:32: [ctltisys] Example 4.10
- ◇ 12:09: [ctltisys] Example 4.11
- ◇ 14:29: [ctltisys] Invertibility
- ◇ 16:39: [ctltisys] Example 4.12
- ◇ 20:12: [ctltisys] BIBO Stability
- ◇ 21:56: [ctltisys] Example 4.14
- ◇ 27:32: [ctltisys] Example 4.15
- ◇ 32:22: [ctltisys] Eigenfunctions of LTI Systems
- ◇ 35:10: [ctltisys] Representations of Functions Using Eigenfunctions
- ◇ 38:07: [ctltisys] Example: Corollary of Theorem 4.12
- ◇ 41:29: [ctltisys] Example 4.16

16 Interlude

The following is a link to the full video:
- ◇ https://youtu.be/5pliTVUox0I [duration: 00:04:54]

The following are links to particular offsets within the video:
- ◇ 00:00: Interlude

17 CT Fourier Series — Introduction

The following is a link to the full video:
- ◇ https://youtu.be/YxQ2Bi3Z4Iw [duration: 00:01:33]

The following are links to particular offsets within the video:
- ◇ 00:00: [ctfs] Unit: Continuous-Time Fourier Series (CTFS)
- ◇ 00:31: [ctfs] Introduction

18 CT Fourier Series — Fourier Series

The following is a link to the full video:

◇ https://youtu.be/u55IQ5kSGoM [duration: 00:19:23]
The following are links to particular offsets within the video:
  ◇ 00:00: [ctfs] Section: Fourier Series
  ◇ 00:16: [ctfs] Harmonically-Related Complex Sinusoids
  ◇ 01:42: [ctfs] CT Fourier Series
  ◇ 03:51: [ctfs] CT Fourier Series (Continued)
  ◇ 06:37: [ctfs] Example 5.1
  ◇ 13:28: [ctfs] Example 5.3

19   CT Fourier Series — Convergence Properties of Fourier Series

The following is a link to the full video:
  ◇ https://youtu.be/Vrf1Q93-JFM [duration: 00:28:16]
The following are links to particular offsets within the video:
  ◇ 00:00: [ctfs] Section: Convergence Properties of Fourier Series
  ◇ 00:32: [ctfs] Remarks on Equality of Functions
  ◇ 06:06: [ctfs] Convergence of Fourier Series
  ◇ 08:48: [ctfs] Convergence of Fourier Series (Continued)
  ◇ 10:38: [ctfs] Convergence of Fourier Series: Continuous Case
  ◇ 11:40: [ctfs] Convergence of Fourier Series: Finite-Energy Case
  ◇ 12:55: [ctfs] Dirichlet Conditions
  ◇ 17:21: [ctfs] Convergence of Fourier Series: Dirichlet Case
  ◇ 18:50: [ctfs] Example 5.6
  ◇ 22:14: [ctfs] Gibbs Phenomenon
  ◇ 23:28: [ctfs] Gibbs Phenomenon: Periodic Square Wave Example
  ◇ 23:41: [ctfs] Gibbs Phenomenon: Periodic Square Wave Example [Annotated]

20   CT Fourier Series — Properties of Fourier Series

The following is a link to the full video:
  ◇ https://youtu.be/WRCjY_pPAZE [duration: 00:10:15]
The following are links to particular offsets within the video:
  ◇ 00:00: [ctfs] Section: Properties of Fourier Series
  ◇ 00:14: [ctfs] Properties of (CT) Fourier Series
  ◇ 00:33: [ctfs] Linearity
  ◇ 01:25: [ctfs] Even and Odd Symmetry
  ◇ 02:07: [ctfs] Real Functions
  ◇ 04:36: [ctfs] Trigonometric Forms of a Fourier Series
  ◇ 08:07: [ctfs] Other Properties of Fourier Series
  ◇ 09:20: [ctfs] Zeroth Coefficient of Fourier Series

21   CT Fourier Series — Fourier Series and Frequency Spectra

The following is a link to the full video:
  ◇ https://youtu.be/FDyi1EUAC9M [duration: 00:22:08]
The following are links to particular offsets within the video:
  ◇ 00:00: [ctfs] Section: Fourier Series and Frequency Spectra
  ◇ 00:20: [ctfs] A New Perspective on Functions: The Frequency Domain
  ◇ 01:50: [ctfs] Motivating Example
  ◇ 04:53: [ctfs] Motivating Example (Continued)

- ◇ 07:01: [ctfs] Fourier Series and Frequency Spectra
- ◇ 10:10: [ctfs] Fourier Series and Frequency Spectra (Continued)
- ◇ 12:20: [ctfs] Example 5.7
- ◇ 20:20: [ctfs] Frequency Spectra of Real Functions

22   CT Fourier Series — Fourier Series and LTI Systems

The following is a link to the full video:
- ◇ https://youtu.be/Vhwaw0NdCDM [duration: 00:25:47]

The following are links to particular offsets within the video:
- ◇ 00:00: [ctfs] Section: Fourier Series and LTI Systems
- ◇ 00:22: [ctfs] Frequency Response
- ◇ 03:26: [ctfs] Fourier Series and LTI Systems
- ◇ 05:24: [ctfs] Example 5.9
- ◇ 09:27: [ctfs] Filtering
- ◇ 10:42: [ctfs] Ideal Lowpass Filter
- ◇ 12:05: [ctfs] Ideal Highpass Filter
- ◇ 13:26: [ctfs] Ideal Bandpass Filter
- ◇ 15:20: [ctfs] Example 5.10

23   CT Fourier Transform — Introduction

The following is a link to the full video:
- ◇ https://youtu.be/uqnNXbisNgA [duration: 00:01:40]

The following are links to particular offsets within the video:
- ◇ 00:00: [ctft] Unit: CT Fourier Transform
- ◇ 00:38: [ctft] Motivation for the Fourier Transform

24   CT Fourier Transform — Fourier Transform

The following is a link to the full video:
- ◇ https://youtu.be/3ghUBR8AHxg [duration: 00:12:45]

The following are links to particular offsets within the video:
- ◇ 00:00: [ctft] Section: Fourier Transform
- ◇ 00:13: [ctft] Development of the Fourier Transform [Aperiodic Case]
- ◇ 01:44: [ctft] Development of the Fourier Transform [Aperiodic Case] (Continued)
- ◇ 03:58: [ctft] Generalized Fourier Transform
- ◇ 05:33: [ctft] CT Fourier Transform (CTFT)
- ◇ 07:12: [ctft] Example 6.1
- ◇ 09:43: [ctft] Example 6.3

25   CT Fourier Transform — Convergence Properties

The following is a link to the full video:
- ◇ https://youtu.be/hWc6Gkscx0A [duration: 00:13:45]

The following are links to particular offsets within the video:
- ◇ 00:00: [ctft] Section: Convergence Properties of the Fourier Transform
- ◇ 00:32: [ctft] Convergence of the Fourier Transform
- ◇ 02:26: [ctft] Convergence of the Fourier Transform: Finite-Energy Case

⋄ 04:14: [ctft] Dirichlet Conditions
⋄ 08:45: [ctft] Convergence of the Fourier Transform: Dirichlet Case
⋄ 10:45: [ctft] Example 6.6

26   CT Fourier Transform — Properties of the Fourier Transform

The following is a link to the full video:
⋄ https://youtu.be/laIz9zjetzc [duration: 01:22:02]
The following are links to particular offsets within the video:
⋄ 00:00: [ctft] Section: Properties of the Fourier Transform
⋄ 00:19: [ctft] Properties of the (CT) Fourier Transform
⋄ 00:36: [ctft] Properties of the (CT) Fourier Transform (Continued)
⋄ 00:52: [ctft] (CT) Fourier Transform Pairs
⋄ 02:08: [ctft] Linearity
⋄ 03:09: [ctft] Example 6.7
⋄ 05:33: [ctft] Time-Domain Shifting (Translation)
⋄ 06:24: [ctft] Example 6.9
⋄ 11:37: [ctft] Frequency-Domain Shifting (Modulation)
⋄ 12:24: [ctft] Example 6.10
⋄ 17:40: [ctft] Time- and Frequency-Domain Scaling (Dilation)
⋄ 18:42: [ctft] Example 6.11
⋄ 23:01: [ctft] Conjugation
⋄ 23:53: [ctft] Example 6.12
⋄ 24:56: [ctft] Duality
⋄ 30:35: [ctft] Example 6.13
⋄ 33:15: [ctft] Time-Domain Convolution
⋄ 34:35: [ctft] Example 6.14
⋄ 37:34: [ctft] Time-Domain Multiplication
⋄ 39:58: [ctft] Example 6.15
⋄ 45:09: [ctft] Time-Domain Differentiation
⋄ 46:48: [ctft] Example 6.16
⋄ 48:26: [ctft] Frequency-Domain Differentiation
⋄ 49:15: [ctft] Example 6.17
⋄ 51:20: [ctft] Time-Domain Integration
⋄ 53:00: [ctft] Example 6.18
⋄ 55:22: [ctft] Parseval's Relation
⋄ 56:54: [ctft] Example 6.19
⋄ 59:12: [ctft] Even/Odd Symmetry
⋄ 59:53: [ctft] Real Functions
⋄ 01:01:33: [ctft] More Fourier Transforms
⋄ 01:01:47: [ctft] Example 6.26
⋄ 01:07:21: [ctft] Exercise 6.5(g)
⋄ 01:16:00: [ctft] Exercise 6.2(j)

27   CT Fourier Transform — Fourier Transform of Periodic Functions

The following is a link to the full video:
⋄ https://youtu.be/oh1MA8axvtI [duration: 00:12:55]
The following are links to particular offsets within the video:
⋄ 00:00: [ctft] Section: Fourier Transform of Periodic Functions
⋄ 00:25: [ctft] Fourier Transform of Periodic Functions

◇ 03:21: [ctft] Fourier Transform of Periodic Functions (Continued)
◇ 05:08: [ctft] Example 6.20
◇ 07:03: [ctft] Example 6.21
◇ 10:00: [ctft] Example 6.24

28   CT Fourier Transform — Fourier Transform and Frequency Spectra of Functions

The following is a link to the full video:

◇ https://youtu.be/1JI9Qs3vbJA [duration: 00:19:03]

The following are links to particular offsets within the video:

◇ 00:00: [ctft] Section: Fourier Transform and Frequency Spectra of Functions
◇ 00:21: [ctft] The Frequency-Domain Perspective on Functions
◇ 02:25: [ctft] Fourier Transform and Frequency Spectra
◇ 04:40: [ctft] Fourier Transform and Frequency Spectra (Continued 1)
◇ 05:55: [ctft] Fourier Transform and Frequency Spectra (Continued 2)
◇ 08:26: [ctft] Example 6.30
◇ 13:31: [ctft] Frequency Spectra of Real Functions
◇ 15:03: [ctft] Bandwidth

29   CT Fourier Transform — Fourier Transform and LTI Systems

The following is a link to the full video:

◇ https://youtu.be/zf9uo2wk8pw [duration: 00:15:42]

The following are links to particular offsets within the video:

◇ 00:00: [ctft] Section: Fourier Transform and LTI Systems
◇ 00:35: [ctft] Frequency Response of LTI Systems
◇ 02:35: [ctft] Frequency Response of LTI Systems (Continued 1)
◇ 04:08: [ctft] Frequency Response of LTI Systems (Continued 2)
◇ 04:53: [ctft] Block Diagram Representations of LTI Systems
◇ 05:49: [ctft] Interconnection of LTI Systems
◇ 07:37: [ctft] LTI Systems and Differential Equations
◇ 09:19: [ctft] Example 6.34
◇ 12:44: [ctft] Example 6.35

30   CT Fourier Transform — Application: Filtering

The following is a link to the full video:

◇ https://youtu.be/tfEhqrCDeJ0 [duration: 00:06:26]

The following are links to particular offsets within the video:

◇ 00:00: [ctft] Section: Application: Filtering
◇ 00:19: [ctft] Filtering
◇ 01:31: [ctft] Ideal Lowpass Filter
◇ 01:33: [ctft] Ideal Highpass Filter
◇ 01:35: [ctft] Ideal Bandpass Filter
◇ 01:48: [ctft] Example 6.38

31 CT Fourier Transform — Application: Circuit Analysis

The following is a link to the full video:
  ◇ https://youtu.be/LTs-O4k9OpQ [duration: 00:17:50]
The following are links to particular offsets within the video:
  ◇ 00:00: [ctft] Section: Application: Circuit Analysis
  ◇ 00:19: [ctft] Electronic Circuits
  ◇ 02:00: [ctft] Resistors
  ◇ 03:05: [ctft] Inductors
  ◇ 04:24: [ctft] Capacitors
  ◇ 05:52: [ctft] Circuit Analysis with the Fourier Transform
  ◇ 07:46: [ctft] Example 6.40

32 CT Fourier Transform — Application: Amplitude Modulation

The following is a link to the full video:
  ◇ https://youtu.be/Ua_H1OiZL-c [duration: 00:28:55]
The following are links to particular offsets within the video:
  ◇ 00:00: [ctft] Section: Application: Amplitude Modulation (AM)
  ◇ 00:46: [ctft] Motivation for Amplitude Modulation (AM)
  ◇ 04:16: [ctft] Trivial Amplitude Modulation (AM) System
  ◇ 09:21: [ctft] Trivial Amplitude Modulation (AM) System: Example
  ◇ 10:06: [ctft] Double-Sideband Suppressed-Carrier (DSB-SC) AM
  ◇ 12:58: [ctft] Example: Analysis of DSB-SC AM — Transmitter
  ◇ 16:14: [ctft] Example: Analysis of DSB-SC AM — Receiver
  ◇ 21:13: [ctft] Example: Analysis of DSB-SC AM — Complete System
  ◇ 24:19: [ctft] Example: Analysis of DSB-SC AM — Spectra
  ◇ 26:46: [ctft] Single-Sideband Suppressed-Carrier (SSB-SC) AM
  ◇ 27:48: [ctft] SSB-SC AM: Example

33 CT Fourier Transform — Application: Sampling and Interpolation

The following is a link to the full video:
  ◇ https://youtu.be/GkOrtV2BkZ8 [duration: 00:33:16]
The following are links to particular offsets within the video:
  ◇ 00:00: [ctft] Section: Application: Sampling and Interpolation
  ◇ 00:31: [ctft] Sampling and Interpolation
  ◇ 02:19: [ctft] Periodic Sampling
  ◇ 03:35: [ctft] Invertibility of Sampling
  ◇ 06:49: [ctft] Model of Sampling
  ◇ 09:16: [ctft] Model of Sampling: Various Signals
  ◇ 10:41: [ctft] Model of Sampling: Invertibility of Sampling Revisited
  ◇ 13:12: [ctft] Model of Sampling: Characterization
  ◇ 15:15: [ctft] Analysis of Sampling — Multiplication by a Periodic Impulse Train (Part 1)
  ◇ 16:37: [ctft] Analysis of Sampling — Fourier Series for a Periodic Impulse Train
  ◇ 18:59: [ctft] Analysis of Sampling — Multiplication by a Periodic Impulse Train (Part 2)
  ◇ 20:15: [ctft] Model of Sampling: Aliasing
  ◇ 22:34: [ctft] Model of Sampling: Aliasing (Continued)
  ◇ 26:38: [ctft] Model of Interpolation
  ◇ 28:43: [ctft] Sampling Theorem
  ◇ 30:33: [ctft] Example 6.41

34 Partial Fraction Expansions (PFEs)

The following is a link to the full video:
- ⋄ https://youtu.be/wgTXbvhSgnk [duration: 00:12:49]

The following are links to particular offsets within the video:
- ⋄ 00:00: [pfe] Unit: Partial Fraction Expansions (PFEs)
- ⋄ 00:10: [pfe] Motivation for PFEs
- ⋄ 00:55: [pfe] Strictly-Proper Rational Functions
- ⋄ 01:53: [pfe] Partial Fraction Expansions (PFEs) [CT and DT Contexts]
- ⋄ 03:28: [pfe] Simple-Pole Case [CT and DT Contexts]
- ⋄ 04:39: [pfe] Example B.1
- ⋄ 07:13: [pfe] Repeated-Pole Case [CT and DT Contexts]
- ⋄ 09:24: [pfe] Example B.2

35 Laplace Transform — Introduction

The following is a link to the full video:
- ⋄ https://youtu.be/uVCVrZOIl9s [duration: 00:02:49]

The following are links to particular offsets within the video:
- ⋄ 00:00: [lt] Unit: Laplace Transform (LT)
- ⋄ 00:32: [lt] Motivation Behind the Laplace Transform
- ⋄ 01:35: [lt] Motivation Behind the Laplace Transform (Continued)

36 Laplace Transform — Laplace Transform

The following is a link to the full video:
- ⋄ https://youtu.be/UOeBiWrAfDs [duration: 00:18:20]

The following are links to particular offsets within the video:
- ⋄ 00:00: [lt] Section: Laplace Transform
- ⋄ 00:15: [lt] (Bilateral) Laplace Transform
- ⋄ 02:07: [lt] Bilateral and Unilateral Laplace Transforms
- ⋄ 03:18: [lt] Relationship Between Laplace and Fourier Transforms
- ⋄ 06:22: [lt] Derivation: LT FT Relationship (Special Case)
- ⋄ 07:40: [lt] Derivation: LT FT Relationship (General Case)
- ⋄ 08:54: [lt] Laplace Transform Examples
- ⋄ 09:08: [lt] Example 7.3
- ⋄ 13:36: [lt] Example 7.4

37 Laplace Transform — Region of Convergence

The following is a link to the full video:
- ⋄ https://youtu.be/DoaZUx55OYw [duration: 00:23:29]

The following are links to particular offsets within the video:
- ⋄ 00:00: [lt] Section: Region of Convergence (ROC)
- ⋄ 00:26: [lt] Left-Half Plane (LHP)
- ⋄ 01:21: [lt] Right-Half Plane (RHP)
- ⋄ 02:08: [lt] Intersection of Sets
- ⋄ 02:49: [lt] Adding a Scalar to a Set
- ⋄ 03:45: [lt] Multiplying a Set by a Scalar
- ⋄ 05:22: [lt] Region of Convergence (ROC)

◇ 06:06: [lt] ROC Property 1: General Form
◇ 07:23: [lt] ROC Property 2: Rational Laplace Transforms
◇ 08:38: [lt] ROC Property 3: Finite-Duration Functions
◇ 09:38: [lt] ROC Property 4: Right-Sided Functions
◇ 10:56: [lt] ROC Property 5: Left-Sided Functions
◇ 12:13: [lt] ROC Property 6: Two-Sided Functions
◇ 13:17: [lt] ROC Property 7: More on Rational Laplace Transforms
◇ 15:20: [lt] General Form of the ROC
◇ 17:11: [lt] Example 7.7

38 Laplace Transform — Properties of the Laplace Transform

The following is a link to the full video:
◇ https://youtu.be/qld0TLDFaxc [duration: 01:00:16]
The following are links to particular offsets within the video:
◇ 00:00: [lt] Section: Properties of the Laplace Transform
◇ 00:21: [lt] Properties of the Laplace Transform
◇ 00:39: [lt] Laplace Transform Pairs
◇ 02:34: [lt] Linearity
◇ 05:00: [lt] Example 7.8
◇ 09:57: [lt] Example 7.9
◇ 14:41: [lt] Time-Domain Shifting
◇ 15:42: [lt] Example 7.10
◇ 17:16: [lt] Laplace-Domain Shifting
◇ 18:56: [lt] Example 7.11
◇ 22:37: [lt] Time-Domain/Laplace-Domain Scaling
◇ 24:31: [lt] Example 7.12
◇ 28:13: [lt] Conjugation
◇ 29:14: [lt] Example 7.13
◇ 33:07: [lt] Time-Domain Convolution
◇ 35:22: [lt] Example 7.14
◇ 37:48: [lt] Time-Domain Differentiation
◇ 40:16: [lt] Example 7.15
◇ 41:43: [lt] Laplace-Domain Differentiation
◇ 42:37: [lt] Example 7.16
◇ 44:29: [lt] Time-Domain Integration
◇ 46:56: [lt] Example 7.17
◇ 49:13: [lt] Initial Value Theorem
◇ 51:23: [lt] Final Value Theorem
◇ 53:36: [lt] Example 7.18
◇ 55:26: [lt] More Laplace Transform Examples
◇ 55:42: [lt] Example 7.19

39 Laplace Transform — Determination of Inverse Laplace Transform

The following is a link to the full video:
◇ https://youtu.be/yW0nCwrwaCQ [duration: 00:20:17]
The following are links to particular offsets within the video:
◇ 00:00: [lt] Section: Determination of Inverse Laplace Transform
◇ 00:10: [lt] Finding Inverse Laplace Transform
◇ 01:18: [lt] Example 7.27

◇ 09:55: [lt] Example 7.28

40 Laplace Transform — Laplace Transform and LTI Systems

The following is a link to the full video:
   ◇ https://youtu.be/MWZV3c6TzJI [duration: 00:33:11]
The following are links to particular offsets within the video:
   ◇ 00:00: [lt] Section: Laplace Transform and LTI Systems
   ◇ 00:37: [lt] System Function of LTI Systems
   ◇ 03:08: [lt] Block Diagram Representations of LTI Systems
   ◇ 03:58: [lt] Interconnection of LTI Systems
   ◇ 05:47: [lt] Causality
   ◇ 09:14: [lt] Example 7.31
   ◇ 12:31: [lt] BIBO Stability
   ◇ 15:22: [lt] Example 7.32
   ◇ 17:24: [lt] Example 7.33
   ◇ 19:24: [lt] Example 7.34
   ◇ 23:38: [lt] Invertibility
   ◇ 26:01: [lt] Example 7.35
   ◇ 27:53: [lt] LTI Systems and Differential Equations
   ◇ 29:51: [lt] Example 7.36
   ◇ 31:39: [lt] Example 7.37

41 Laplace Transform — Application: Circuit Analysis

The following is a link to the full video:
   ◇ https://youtu.be/cf8JIy83DdQ [duration: 00:15:42]
The following are links to particular offsets within the video:
   ◇ 00:00: [lt] Section: Application: Circuit Analysis
   ◇ 00:12: [lt] Electronic Circuits
   ◇ 01:15: [lt] Resistors
   ◇ 01:17: [lt] Inductors
   ◇ 01:19: [lt] Capacitors
   ◇ 01:24: [lt] Circuit Analysis With the Laplace Transform
   ◇ 03:25: [lt] Example 7.38

42 Laplace Transform — Application: Design and Analysis of Control Systems

The following is a link to the full video:
   ◇ https://youtu.be/SgK69mQdgiw [duration: 00:29:03]
The following are links to particular offsets within the video:
   ◇ 00:00: [lt] Section: Application: Design and Analysis of Control Systems
   ◇ 00:13: [lt] Control Systems
   ◇ 02:35: [lt] Feedback Control Systems
   ◇ 05:27: [lt] Stability Analysis of Feedback Systems
   ◇ 07:40: [lt] Example 7.40 — Stabilization Example: Unstable Plant
   ◇ 08:52: [lt] Example 7.40 — Stabilization Example: Using Pole-Zero Cancellation
   ◇ 11:04: [lt] Example 7.40 — Stabilization Example: Using Feedback (1)

⋄ 13:42: [lt] Example 7.40 — Stabilization Example: Using Feedback (2)
⋄ 17:04: [lt] Example 7.40 — Stabilization Example: Using Feedback (3)
⋄ 17:55: [lt] Example 7.40 — Remarks on Stabilization Via Pole-Zero Cancellation
⋄ 20:12: [lt] Exercise 7.30

43   Laplace Transform — Unilateral Laplace Transform

The following is a link to the full video:
⋄ https://youtu.be/ac6Nbs6hf7M [duration: 00:20:52]
The following are links to particular offsets within the video:
⋄ 00:00: [lt] Section: Unilateral Laplace Transform
⋄ 00:32: [lt] Unilateral Laplace Transform
⋄ 03:15: [lt] Inversion of the Unilateral Laplace Transform
⋄ 05:40: [lt] Unilateral Versus Bilateral Laplace Transform
⋄ 07:39: [lt] Properties of the Unilateral Laplace Transform
⋄ 09:14: [lt] Unilateral Laplace Transform Pairs
⋄ 10:21: [lt] Solving Differential Equations Using the Unilateral Laplace Transform
⋄ 11:31: [lt] Example 7.42
⋄ 14:25: [lt] Example 7.43