

G.2.1 Video-Lecture Catalog

To allow the content in the video lectures to be more easily located and navigated, a catalog of the video lectures is included below. This catalog contains a list of all slides covered in the lectures, where each slide in the list has a link to the corresponding time offset in the YouTube video where the slide is covered. By using this catalog, it is a trivial exercise to jump to the exact point in the video lectures where a specific slide/topic is covered (i.e., simply click on the appropriate hyperlink).

G.2.1.1 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)

G.2.1.2 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

G.2.1.3 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

G.2.1.4 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

G.2.1.5 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)

G.2.1.6 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

G.2.1.7 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

G.2.1.8 CT Signals and Systems — Function Properties

The following is a link to the full video:

- ◇ <https://youtu.be/PRD3WoWrx44> [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

G.2.1.9 CT Signals and Systems — Elementary Functions

The following is a link to the full video:

- ◇ <https://youtu.be/qVur0xA8oYM> [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

G.2.1.10 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

G.2.1.11 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

G.2.1.12 CT LTI Systems — Introduction

The following is a link to the full video:

- ◇ <https://youtu.be/o012SX3Fzw8> [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?

G.2.1.13 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

G.2.1.14 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

G.2.1.15 CT LTI Systems — Properties of LTI Systems

The following is a link to the full video:

- ◇ <https://youtu.be/c0hpZyxyDW8> [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

G.2.1.16 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

G.2.1.17 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

G.2.1.18 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

G.2.1.19 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]

G.2.1.20 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

G.2.1.21 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

G.2.1.22 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

G.2.1.23 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

G.2.1.24 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

G.2.1.25 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

G.2.1.26 CT Fourier Transform — Properties of the Fourier Transform

The following is a link to the full video:

- ◊ <https://youtu.be/1aIz9zjetzc> [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)

G.2.1.27 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

G.2.1.28 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

G.2.1.29 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

G.2.1.30 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

G.2.1.31 CT Fourier Transform — Application: Circuit Analysis

The following is a link to the full video:

- ◇ <https://youtu.be/LTs-04k90pQ> [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

G.2.1.32 CT Fourier Transform — Application: Amplitude Modulation

The following is a link to the full video:

- ◇ https://youtu.be/Ua_H10iZL-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

G.2.1.33 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

G.2.1.34 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

G.2.1.35 Laplace Transform — Introduction

The following is a link to the full video:

- ◇ <https://youtu.be/uVCVrZOI19s> [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)

G.2.1.36 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

G.2.1.37 Laplace Transform — Region of Convergence

The following is a link to the full video:

- ◇ <https://youtu.be/DoaZUx550Yw> [duration: 00:23:29]

The following are links to particular offsets within the video:

- ◇ 00:00: [It] Section: Region of Convergence (ROC)
- ◇ 00:26: [It] Left-Half Plane (LHP)
- ◇ 01:21: [It] Right-Half Plane (RHP)
- ◇ 02:08: [It] Intersection of Sets
- ◇ 02:49: [It] Adding a Scalar to a Set
- ◇ 03:45: [It] Multiplying a Set by a Scalar
- ◇ 05:22: [It] Region of Convergence (ROC)
- ◇ 06:06: [It] ROC Property 1: General Form
- ◇ 07:23: [It] ROC Property 2: Rational Laplace Transforms
- ◇ 08:38: [It] ROC Property 3: Finite-Duration Functions
- ◇ 09:38: [It] ROC Property 4: Right-Sided Functions
- ◇ 10:56: [It] ROC Property 5: Left-Sided Functions
- ◇ 12:13: [It] ROC Property 6: Two-Sided Functions
- ◇ 13:17: [It] ROC Property 7: More on Rational Laplace Transforms
- ◇ 15:20: [It] General Form of the ROC
- ◇ 17:11: [It] Example 7.7

G.2.1.38 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: [It] Section: Properties of the Laplace Transform
- ◇ 00:21: [It] Properties of the Laplace Transform
- ◇ 00:39: [It] Laplace Transform Pairs
- ◇ 02:34: [It] Linearity
- ◇ 05:00: [It] Example 7.8
- ◇ 09:57: [It] Example 7.9
- ◇ 14:41: [It] Time-Domain Shifting
- ◇ 15:42: [It] Example 7.10
- ◇ 17:16: [It] Laplace-Domain Shifting
- ◇ 18:56: [It] Example 7.11
- ◇ 22:37: [It] Time-Domain/Laplace-Domain Scaling
- ◇ 24:31: [It] Example 7.12
- ◇ 28:13: [It] Conjugation
- ◇ 29:14: [It] Example 7.13
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- ◇ 35:22: [It] Example 7.14
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- ◇ 40:16: [It] Example 7.15
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- ◇ 42:37: [It] Example 7.16
- ◇ 44:29: [It] Time-Domain Integration
- ◇ 46:56: [It] Example 7.17
- ◇ 49:13: [It] Initial Value Theorem
- ◇ 51:23: [It] Final Value Theorem
- ◇ 53:36: [It] Example 7.18
- ◇ 55:26: [It] More Laplace Transform Examples

- ◇ 55:42: [It] Example 7.19

G.2.1.39 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: [It] Section: Determination of Inverse Laplace Transform
- ◇ 00:10: [It] Finding Inverse Laplace Transform
- ◇ 01:18: [It] Example 7.27
- ◇ 09:55: [It] Example 7.28

G.2.1.40 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: [It] Section: Laplace Transform and LTI Systems
- ◇ 00:37: [It] System Function of LTI Systems
- ◇ 03:08: [It] Block Diagram Representations of LTI Systems
- ◇ 03:58: [It] Interconnection of LTI Systems
- ◇ 05:47: [It] Causality
- ◇ 09:14: [It] Example 7.31
- ◇ 12:31: [It] BIBO Stability
- ◇ 15:22: [It] Example 7.32
- ◇ 17:24: [It] Example 7.33
- ◇ 19:24: [It] Example 7.34
- ◇ 23:38: [It] Invertibility
- ◇ 26:01: [It] Example 7.35
- ◇ 27:53: [It] LTI Systems and Differential Equations
- ◇ 29:51: [It] Example 7.36
- ◇ 31:39: [It] Example 7.37

G.2.1.41 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: [It] Section: Application: Circuit Analysis
- ◇ 00:12: [It] Electronic Circuits
- ◇ 01:15: [It] Resistors
- ◇ 01:17: [It] Inductors
- ◇ 01:19: [It] Capacitors
- ◇ 01:24: [It] Circuit Analysis With the Laplace Transform
- ◇ 03:25: [It] Example 7.38

G.2.1.42 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: [It] Section: Application: Design and Analysis of Control Systems
- ◇ 00:13: [It] Control Systems

- ◇ 02:35: [It] Feedback Control Systems
- ◇ 05:27: [It] Stability Analysis of Feedback Systems
- ◇ 07:40: [It] Example 7.40 — Stabilization Example: Unstable Plant
- ◇ 08:52: [It] Example 7.40 — Stabilization Example: Using Pole-Zero Cancellation
- ◇ 11:04: [It] Example 7.40 — Stabilization Example: Using Feedback (1)
- ◇ 13:42: [It] Example 7.40 — Stabilization Example: Using Feedback (2)
- ◇ 17:04: [It] Example 7.40 — Stabilization Example: Using Feedback (3)
- ◇ 17:55: [It] Example 7.40 — Remarks on Stabilization Via Pole-Zero Cancellation
- ◇ 20:12: [It] Exercise 7.30

G.2.1.43 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: [It] Section: Unilateral Laplace Transform
- ◇ 00:32: [It] Unilateral Laplace Transform
- ◇ 03:15: [It] Inversion of the Unilateral Laplace Transform
- ◇ 05:40: [It] Unilateral Versus Bilateral Laplace Transform
- ◇ 07:39: [It] Properties of the Unilateral Laplace Transform
- ◇ 09:14: [It] Unilateral Laplace Transform Pairs
- ◇ 10:21: [It] Solving Differential Equations Using the Unilateral Laplace Transform
- ◇ 11:31: [It] Example 7.42
- ◇ 14:25: [It] Example 7.43

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