SYLLABUS

EC630202 SIGNALS AND SYSTEMS L T

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COURSE OBJECTIVE:

- To analyze the characteristics of continuous, discrete signals and systems.
- To characterize different transforms and their application in system analysis.
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- To characterize different transforms and their application in system analysis.
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- To analyze the characteristics of continuous, discrete signals and systems.

COURSE OUTCOMES:

After completing this course, the student will be able to:

CO1:Classify the Signals and Systems using properties.

CO2: Analyze any continuous time signals and systems using Fourier Methods.

CO3: Analyze the continuous time signals and systems using Laplace Transform. CO4:Analyze any discrete time signals and systems using DTFT and Z transforms CO5:Apply DFT effectively in signal analysis.

UNIT I CLASSIFICATION OF SIGNALS AND SYSTEMS

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Continuous time signals (CT signals) – discrete time signals (DT signals) – Step, Ramp, Pulse, Impulse, Exponential – Transformation of the independent variable – Classification of CT and DT signals – CT systems and DT systems – Basic system properties – Linear Time invariant (LTI) Systems and properties.

UNIT II FOURIER SERIES REPRESENTATION AND CT FOURIER TRANSFORM 12

Fourier Series representation of CT periodic signals – Convergence of Fourier Series – Properties – Differential equation – Convolution integral – Properties – Impulse response of Interconnected systems – Fourier Transform Representation of an aperiodic signal – Convergence of Fourier Transforms – Properties – Analysis of LTI Systems using Fourier Transform – Impulse response – Frequency response.

UNIT III LAPLACE TRANSFORM **12**

Laplace Transform – Region of Convergence for Laplace Transform – Inverse Laplace Transform – Unilateral Laplace Transform – Properties – Analysis of LTI Systems using Laplace Transform – Impulse response – State variable equations and matrix representation of systems.

UNIT IV DISCRETE–TIME FOURIER TRANSFORM AND Z TRANSFORM 12

Difference equation – Convolution sum – Properties – Impulse response of Interconnected systems

– DTFT and properties. Z–Transform – Region of Convergence for Z–Transform – Inverse Z–

Transform –Unilateral Z–Transform –Properties – Analysis of LTI Systems using Z–Transform –

Impulse response – State variable equations and matrix representation of systems

UNIT V DFT & FFT **12**

Discrete Fourier Transform (DFT) - deriving DFT from DTFT, properties of DFT - periodicity, symmetry, circular convolution. Fast computation of DFT - Radix-2 Decimation-in-time (DIT) Fast Fourier transform (FFT), Decimation- in-frequency (DIF) Fast Fourier transform (FFT). Linear filtering using FFT.

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OTAL: 45 PERIODS TEXT BOOKS:

1. Allan V.Oppenheim, S.Wilsky and S.H.Nawab, “Signals and Systems”, Pearson Education, 2007.
2. Robert A. Gabel and Richard A.Roberts, “Signals & Linear Systems”, 3rd Edition, John Wiley, 1987

REFERENCES:

1.H P Hsu and RakeshRanjan,“ Signals and Systems, Schaum’s Outlines”, Tata McGraw Hill, 2007

2.S.Salivahanan, “Digital Signal Processing”, 3rd Edition, McGraw Hill International/TMH, 2015.

3.Simon Haykin and Barry Van Veen, “Signals and Systems” John Wiley &sons, Inc, 2004