

<b>4<sup>th</sup> Semester</b>	<b>REE4D002</b>	<b>Signal and Systems</b>	<b>L-T-P 3-0-0</b>	<b>3 CREDITS</b>
--------------------------------	-----------------	---------------------------	------------------------	------------------

**MODULE – I (7 Hours)**

**Discrete-Time Signals and Systems:**

Discrete-Time Signals: Some Elementary Discrete-Time signals, Classification of Discrete-Time Signals, Simple Manipulation, Discrete-Time Systems : Input-Output Description, Block Diagram Representation, Classification, Interconnection.

**MODULE – II (8 Hours)**

Analysis of Discrete-Time LTI Systems: Techniques, Response of LTI Systems, Properties of Convolution, Causal LTI Systems, Stability of LTI Systems; Discrete-Time Systems Described by Difference Equations; Implementation of Discrete-Time Systems. Correlation of Discrete-Time Signals: Cross correlation and Autocorrelation Sequences, Properties.

**MODULE – III (10 Hours)**

**The Continuous-Time Fourier Series:**

Basic Concepts and Development of the Fourier series; Calculation of the Fourier Series, Properties of the Fourier Series.

**The Continuous-Time Fourier Transform:**

Basic Concepts and Development of the Fourier Transform; Properties of the Continuous-Time Fourier Transform.

**MODULE- IV (10 Hours)**

**The Z-Transform and Its Application to the Analysis of LTI Systems:**

The Z-Transform: The Direct Z-Transform, The Inverse Z-Transform; Properties of the Z-Transform; Rational Z-Transforms: Poles and Zeros, Pole Location and Time-Domain Behavior for Causal Signals, The System Function of a Linear Time-Invariant System; Inversion of the Z-Transforms: The Inversion of the Z-Transform by Power Series Expansion, The Inversion of the Z-Transform by Partial-Fraction Expansion; The One-sided Z-Transform: Definition and Properties, Solution of Difference Equations.

**MODULE- V (10 Hours)**

**The Discrete Fourier Transform: Its Properties and Applications:**

Frequency Domain Sampling: The Discrete Fourier Transform; Properties of the DFT: Periodicity, Linearity, and Symmetry Properties, Multiplication of Two DFTs and Circular Convolution, Additional DFT Properties.

**Books:**

1. Digital Signal Processing – Principles, Algorithms and Applications, John. G. Proakis and Dimitris. G. Manolakis, 4th Edition, Pearson.
2. Fundamentals of Signals and Systems - M. J. Roberts, TMH
3. Signal & Systems by Tarun Kumar Rawat, Oxford University Press.
4. Signals and Systems – A NagoorKani, TMH
5. Signals and Systems, Chi-Tsong Chen, Oxford
6. Principles of Signal Processing and Linear Systems, B.P. Lathi, Oxford.
7. Principles of Linear Systems and Signals, B.P Lathi, Oxford