Course Type	Course Code	Name of Course	L	Т	Р	Credit
OE	EEO403	Digital Signal Processing	3	0	0	9

Course Objective

The objective of the course is to present an introductory concept as well as some design ideas on the Digital Signal Processing.

Learning Outcomes

Upon successful completion of the course the students will acquire the basic knowledge on the Digital Signal Processing, the analysis and derivation of different relevant topics such as DFT (Discrete Fourier transform) and FFT (Fast Fourier Transform) which are used in various domains of science and technology. They will know the basic ideas for designing various digital filters. They will be acquainted with some applications.

Unit No.	Topics to be covered	Lecture Hours	Learning Outcome
1	Introduction, Sampling, aliasing, z-transform and its properties, discrete-LTI systems, z-transfer function, discrete convolution, inverse z-transform.	13	Understanding of sampling of continuous-time signal to obtain discrete-time system, z- transformation and its application.
2	Digital filters – FIR and IIR filters, Filter structure, Design of FIR and IIR filters, Effect of finite word length. Correlation of discrete-time signals, Fourier transform of signals. Discrete Fourier transform and Fast Fourier Transform algorithms, Applications of FFT – spectrum analysis, FFT based digital filtering.	15	Knowledge on Discrete Fourier transform, Fast Fourier Transform and design knowledge of digital filter design and realization.
3	Digital signal processing of continuous time signals – sampling, anti-aliasing filter, sample and hold process, reconstruction filter. Application of digital signal processing in spectral analysis of sinusoidal signals, non-stationery signals and in musical signal processing.	14	Acquaintance with some issues on processing continuous-time signal and application of DSP in some cases.

Text Books:

1. Proakis J G, Manolakis D G (and D Sharma) – Digital Signal Processing: Principles, Algorithms and Applications.

Reference Books:

- 1. Oppenheim A V, Schafer R W Discrete-Time signal processing.
- 2. Hayes M H Schaum's Outlines: Digital Signal Processing.
- 3. S K Mitra Digital Signal Processing: A Computer-Based Approached