GUJARAT TECHNOLOGICAL UNIVERSITY
POWER ELECTRONICS
M.E. Semester: I

Subject Name: **Digital Signal Controller**

Sr. No.	Course Content
1.	**Discrete Time Signals:** Sequences & systems, linear time invariant systems & their properties. Difference equations. Frequency domain representations of discrete time signals & systems. DTFT.
2.	**Sampling of Continuous Time Signals:** Frequency domain representation of sampling, reconstruction of a band-limited signal from its samples, discrete time processing of continuous time signals, continuous time processing of discrete time signals, changing the sampling rate using discrete time processing ,aliasing & its remedies.
3.	**Z-Transform:** Properties of Z-transform, properties of ROC for the Z-transform, inverse Z-transform , complex convolution theorem, parseval's relation, unilateral Z-transform. Transform analysis of linear time invariant systems- Frequency response of LTI systems, systems functions frequency response for rational system functions, relationship between magnitude & single-phase , All-pass systems, Minimum phase system.
4.	**Structures Of Discrete Time Systems:** Signal flow graph representation of linear constant coefficient difference equation. Basic structures of FIR & IIR systems. Design of FIR filters by windowing; Kaiser window. Design of IIR filters from continuous time filter.
5.	**Discrete Fourier Transform:** DFT & its properties, Linear convolution using DFT, decimation in time FFT algorithm, implementation of the DFT using convolution, Discrete Hilbert transform.
6.	**Digital Signal Processor:** Computer architectures for signal processing, General-purpose digital signal processors, selection criteria, Implementation of DSP algorithms.

Reference Books:

1. Digital Signal Processing, Proakis & Monolakis , PHI.
2. Discrete-Time Signal Processing – Alan V. Oppenheim & Ronald W. Schafer & Buck PHI, Pvt., Ltd., New Delhi.
3. Theory & Application of Digital Signal Processing – L. R. Rabiner & B. Gold, PHI.
4. Data Books and Application Notes of DSP chip from Manufacturers.
5. Sanjit Mitra, Digital Signal processing, McGraw-Hill Science/Engineering/Math; 3 edition, 2005.
6. Digital Signal Processing by Emmanuel C.Ifeachor & Barrie W.Jervis, Pearson Edu.