

APPLIED GROUP II (C) : DIGITAL SIGNAL PROCESSING

Unit I : Signal and Systems

Introduction – Signals – Systems – The frequency domain - from concept to application. Analog signals – Operations on signals – Signal Symmetry – Harmonic signals and sinusoids – Commonly Encountered Signals – The impulse function – the Doublet – Moments. Discrete signals – Operations on discrete signals.

Unit II : Analog Systems

Analog systems – Introduction – System classification – Analysis of linear time invariant (LTI) Systems – LTI Systems Described by Differential Equations – The Impulse Response of LTI Systems – System Stability – Application Oriented Examples.

Unit III : Analog Systems

Discrete – time systems – Discrete – time Operators – System Classification – Digital Filters – Digital Filters Described by Difference Equations - Impulse Response of Digital Filters – Stability of Discrete Time LTI Systems – Connections : System Representative in Various Forms.

Unit IV : Fourier Series

Fourier Series – Parseval's Relation and the Power in Periodic Signals – The Spectrum of Periodic Signals – Properties of Fourier Series – Signal Reconstruction and the Gibbs Effect – System Response to Periodic Inputs – Application oriented Examples – Dirichlet Kernel and Gibbs Effect – Fourier Series, Orthogonality, and Least Squares – Existence, Convergence and Uniqueness – Historical Perspective.

Unit V : Fourier Transform

Fourier Transform – Fourier Transform Pairs and Properties – System analysis using Fourier Transform – Frequency Response of Filters – Energy and Power Spectral Density – Time Band width Measures.

Book for Study

1. Analog and Digital Signal Processing, 2nd Edition, Ashok Ambardar, Brooks & Cole Publishing Company, 2001 (Indian edition)

Books for Reference

1. Theory and Applications of Digital Signal Processing – L.R. Rainer and B.Gold, Prentice Hall India – New Delhi, 1975.
2. Digital Signal Processing – Salivahanan – Tata McGraw Hill Publishing Company
3. Digital Signal Processing – Allan V.Oppenheim and Ronald W., Schafer, Prentice Hall of India, New Delhi, 2000.
4. Architecture of Digital Signal Processing – Perter Pirsch – John Wiley – 1998
5. Introduction to Digital Signal Processing – Johny R.Johnson.