RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

Credit Based Grading System

Electrical Engineering, VI Semester

EE-6005 Elective – II (I) Digital Signal Processing

COURSE CONTENTS

Unit-I

Introduction to Digital Signal Processing. Discrete time signals & sequences, linear shift invariant systems, stability and causality. Linear-constant coefficient difference equations. Frequency domain representation of discrete time signals and systems.

Unit-II

Applications of z-transforms, solution of difference equations of digital filters. System function, stability criterion, frequency response of stable systems. Realization of digital filters - direct, canonic, cascade & parallel forms.

Unit-III

Discrete Fourier series: Properties of discrete Fourier series, DFS representation of periodic sequences. Discrete Fourier Transforms: Properties of DFT: Fast Fourier Transforms (FFT) - Radix-2 decimation in time and decimation in frequency FFT Algorithms. Inverse FFT.

Unit-IV

IIR DIGITAL FILTERS: Analog filter approximations - Butterworth and Chebyshev. Design of IIR Digital filters from analog filters. Bilinear transformation method, step & impulse invariance techniques. Spectral Transformations.

Unit-V

FIR DIGITAL FILTERS: Characteristics of FIR Digital Filters frequency response. Design of FIR Digital Filters using Window Techniques. Comparison of IIR and FIR filters.

References:

1. Oppenheim & Schaffer, Digital Signal Processing, PHI.

2. John G. Proakis Digital Signal Processing: Principles, Algorithms, And Applications, 4/E

3. A. Anand Kumar Digital Signal Processing ,PHI

4. S.K. Mitra, Digital Signal Processing, TMH

5. Prof. N. Sarkar, Elements of Digital Signal Processing, Khanna Publication

6. Ludeman Fundamental of Digital Signal Processing, wileyindia

7. A. Antoniou, Digital Filters Analysis & Design, TMH