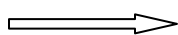


M.A/M.Sc Mathematics Semester 4th

Effective from academic session 2011



Repetition for 2012 with minor change

WAVELET ANALYSIS

Course No. MM-OP-408

Unit-I:

ELEMENTS OF FOURIER ANALYSIS: Fourier series, Fourier transforms, Inversion formula, Parseval Identity and Plancherel Theorem, Continuous-time convolution and the delta function, Heisenberg uncertainty principle, Poisson's summable formula, Shannon sampling theorem, Fourier transforms of tempered distributions

Unit-II:

WAVELET TRANSFORM: Time - frequency localization, definition and examples of wavelets, Dyadic wavelets, Wavelet series, Orthonormal wavelet bases, continuous and discrete wavelet transform, frames.

Unit-III:

SCALING FUNCTIONS AND MULTI-RESOLUTION ANALYSIS (MRA): Multiresolution analysis, orthonormal systems and Riesz systems, scaling equations and structure constants, from scaling function to MRA and orthonormal wavelet.

Unit –IV:

COMPACTLY SUPPORTED WAVELETS AND CONVERGENCE PROPERTIES: Spline wavelets and their properties, wavelets with compact support, construction of compact wavelets, smoothness of wavelets, convergence properties of wavelet series.

Recommended Books

1. Ten lectures of wavelets, Daubechies, I, CBMS series, Philadelphia, SIAM, 1992.
2. Introduction to Fourier analysis and wavelets, Pinsky, M, A, Brooks/Cole 2002.

Suggested Readings

1. A first course on wavelets, Hernandez, E and G. Weiss, Boca Raton, FL, CRC press, 1996.
2. An introduction to wavelets, Chui, C.K, San Diego, Academic press, 1992