# ELECTIVE II

## **Digital Image Processing**

### UNIT 1: Introduction of Digital Image Processing (DIP)

Introduction to the DIP areas and applications; Components of Digital Image Processing; Elements of Visual Perception; Image Sensing and Acquisition; Image Sampling and Quantization; Relationships between pixels; color models.

#### **UNIT 2: Image Enhancement**

Spatial Domain: Gray level transformations; Histogram processing; Basics of Spatial Filtering; Smoothing and Sharpening Spatial Filtering Frequency Domain: Introduction to Fourier Transform; Smoothing and Sharpening frequency domain filters; Ideal, Butterworth and Gaussian filters

#### **UNIT 3: Image Restoration**

Noise models; Mean Filters; Order Statistics; Adaptive filters; Band reject Filters; Band pass Filters; Notch Filters; Optimum Notch Filtering; Inverse Filtering; Wiener filtering

#### **UNIT4: Feature Extraction and Image Segmentation**

**Feature Extraction**: Contour and shape dependent feature extraction, Extraction of textural features **Segmentation**: Detection of Discontinuities; Edge Linking and Boundary detection; Region based segmentation; Morphological processing- erosion and dilation.

#### **UNIT 5: Image Compression and Encoding**

Entropy-based schemes, Transform-based encoding, Predictive encoding and DPCM, Vector quantization, Huffman coding.