CSE 903 TH: Image Processing **Credit:4**

Course Outcomes (CO):

i. Understand the basic theory and algorithms/ techniques that are widely used in digital image processing.
ii. Understand image analysis algorithms.
iii. Understand current applications of Image Processing.
iv. Develop hands-on experience in using computers to process images.

Syllabus:

Introduction, image definition and its representation, neighbourhood. Orthogonal transformations like DFT,DCT, Wavelet.

Enhancement: contrast enhancement, smoothing and sharpening, filtering and restoration

Segmentation: pixel classification, global/local gray level thresholding, region growing, split/merge techniques, edge detection operators, Hough transform. Image feature/primitive extraction, component labelling, medial axis transform, skeletonization/thinning, shape properties, textural features – moments, gray level co-occurrence matrix, structural features, Fourier descriptor, polygonal approximation. Compression: coding, quantization, spatial and transform domain-based compression. Color image processing: color model, enhancement, and segmentation.

Mathematical morphology: basic concepts, erosion, dilation, opening, closing. Advanced applications likebiomedical image processing, digital watermarking, etc

References:

1. R. C. Gonzalez and R. E. Woods, Digital Image Processing, Addison-Wesley, California, 1993.
2. Rosenfeld and A. C. Kak, Digital Picture Processing, Vol. 1 & 2, 2nd ed. Academic Press, Inc. 1982.
3. Chanda and D. Dutta Mazumdar, Digital Image Processing and Analysis, Prentice Hall of India, NewDelhi, 2000.