## *SUBJECT NO-EC60501, SUBJECT NAME- DIGITAL IMAGE PROCESSING*
### *LTP- 3-1-0,CRD- 4*

**SYLLABUS :-**

Pre-requisites: EC31008Digital image fundamentals: Visual perception, image sensing and acquisition, sampling and quantization, basic relationship between pixels and their neighborhood properties; Image enhancement in spatial domain: Gray-level transformations, histogram equalization, spatial filters- averaging, order statistics; Edge detection: first and second derivative filters, Sobel, Canny, Laplacian and Laplacian-of Gaussion masks; Image filtering in frequency domain: One and two-dimensional DFT, properties of 2-D DFT, periodicity properties, convolution and correlation theorems, Fast Fourier Transforms, Smoothing and sharpening filtering in frequency domain, ideal and Butterworth filters, homomorphic filtering; Image restoration: Degradation/ restoration process, noise models, restoration in presence of noise-only spatial filtering, linear position-invariant degradations, estimating the degradation function, inverse filtering, Wiener filtering, constrained least squares filtering, geometric transformations; Color image processing: Color models ÃÂ¢ÃÂÃÂ RGB, HSI, YUV, pseudo-color image processing, full-color image processing, color transformation, color segmentation, noise in color images; Morphological Image Processing: Basic operations- dilation, erosion, opening, closing, Hit-Miss transformations, Basic morphological algorithms- boundary extraction, region filling, connected components, convex hull, thinning, thickening, skeletons, pruning, extensions to gray-scale morphology; Image segmentation: Edge linking and boundary detection, Hough transforms, graph-theoretic techniques, global and adaptive thresholding, Region based segmentation, Segmentation by morphological watersheds, motion based segmentation; Texture Analysis: Co-occurrence matrix, Gabor filter.