

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E

Communication Engineering

Subject Name: **Image Processing**

Sr.No	Course content
1	Introduction – Image as a 2D data, Image representation – Gray scale and Color images, image sampling and quantization.
2	Frequency domain processing – Two dimensional orthogonal transforms: DFT, FFT, WHT. Haar transform, KLT, DCT.
3	Image enhancement – filters in spatial and frequency domains, histogram-based processing, Homomorphic filtering.
4	Edge detection – non parametric and model based approaches, LOG filters, localization problem
5	Image restoration – PSF, circulant and block circulant matrices, deconvolution, restoration using inverse filtering. Wiener filtering and maximum entropy- based methods.
6	Mathematical morphology – binary morphology, dilation, erosion, opening and closing duality relations, gray scale morphology, application such as hit-and-miss transform thinning and shape decomposition.
7	Image communication – JPED, JPEG 2000, MPEGs and H.26x standards packet video, error concealment.
8	Image texture analysis co-occurrence matrix, measures of textures, statistical models for textures, principal component analysis.
9	Misc. topic such as – Hough Transform, boundary detection, chain coding, and segmentation, thresholding methods.

Reference Books:

1. R. Gonzalez and E. Woods, Digital Image Processing, PHI
2. A. K. Jain, Fundamentals of digital image processing, Prentice Hall of India.
3. W. K. Pratt, Digital image processing, Prentice Hall
4. Rosenfold and A. C. Kak, Digital imag processing, Vol 1 & 2, Prentice Hall.