GUJARAT TECHNOLOGICAL UNIVERSITY
M.E Semester: 2

Electrical Engineering

Subject Name : Digital Image Processing (Micro)

Sr. No.	Course Content
1	Image Processing Operation, Digital Image Representation: Coordinate Conventions, Images as Matrices, Reading, writing and displaying Images, Data Classes Image Types: Binary and Intensity Images; Conversion of Image classes and types, Array Indexing, Vector Indexing.
2	Intensity and Spatial Transforms: Intensity Transformation Functions : Logarithmic and Contrast-Stretching Transformations; Histogram Processing and Function Plotting - Generating and Plotting Image Histograms , Histogram Equalization and Histogram Matching (Specification) , Spatial Filtering- Linear and Non Linear, Standard Filters.
3	Frequency Domain Processing: Filtering in frequency domain-DFT, Generating Frequency domain filters- from Spacial Domain, Direct Method.Mesh Grid Array, LP filters, Sharpening- HP filters, HF emphesis filtering, Wireframe and surface Plotting
4	Image Restoration: Degradation Model, Noise Models, Periodic Noise, Estimation of Noise Parameters, Direct Inverse Filters-Winner Filtering, Constrained LS filters, Adaptive Noise Filters, Noise reduction –Spatial Domian, Frequency domain. Blind Deconvolution
5	Color Image Processing: Image Representation- RGB, Indexed Images. Space coversion- NYSC, YCbCr, HSV, HIS, CMY and CMYK; Basics of Color Image processing, Smooting and Sharpening,Segmentation
6	Image Compression: Color Redundancy- Interpixel, Psychological, Huffman code-coding & Decoding, RGB Compression-JPEG, JpEG2000
7	Image Segmentaion: Point, Line and Edge detection, Hough Transform for Detection, Thrshoulding -Local and Globel, Region Based Segmenation, Wvalet transform and application for Image Segementation, Distacne Transform and Watershed Segmentation
8	Object Recognition: Distance Measures, Decision Theoratic Methods-Maximum Distance classifier, Correlation matching, String Matching, Optimal Statistical Classifier, Adative Recognition.

Reference Books

1. Gonzalez and Woods: Digital Image Processing
2. Gonzalez and Woods: Digital Image Processing using MATLAB
3. Anil K Jain: Fundamentals of Digital Image Processing - PHI
4. Castleman: Digital Image Processing
5. Madhuri Joshi: Digital Image Processing