Subject Name: EC2029Digital Image Processing

Staff Name : A.Jayachitra , Associate Professor

Year : Final Year –ECE ‘B’ Section

**Syllabus:**

**UNIT I DIGITAL IMAGE FUNDAMENTALS**

Elements of digital image processing systems, Vidicon and Digital Camera workingprinciples, Elements of visual perception, brightness, contrast, hue, saturation, machband effect, Color image fundamentals - RGB, HSI models, Image sampling,Quantization, dither, Two-dimensional mathematical preliminaries, 2D transforms - DFT,DCT, KLT, SVD.

**UNIT II IMAGE ENHANCEMENT**

Histogram equalization and specification techniques, Noise distributions, Spatialaveraging, Directional Smoothing, Median, Geometric mean, Harmonic mean,Contraharmonic mean filters, Homomorphic filtering, Color image enhancement.

**UNIT III IMAGE RESTORATION**

Image Restoration - degradation model, Unconstrained restoration - Lagrange multiplierand Constrained restoration, Inverse filtering-removal of blur caused by uniform linearmotion, Wiener filtering, Geometric transformations-spatial transformations.

**UNIT IV IMAGE SEGMENTATION**

Edge detection, Edge linking via Hough transform – Thresholding - Region basedsegmentation – Region growing – Region splitting and Merging – Segmentation bymorphological watersheds – basic concepts – Dam construction – Watershedsegmentation algorithm.

**UNIT V IMAGE COMPRESSION**

Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmeticcoding, Vector Quantization, Transform coding, JPEG standard, MPEG.

**TEXTBOOK**

1. Rafael C. Gonzalez, Richard E. Woods, , Digital Image Processing', Pearson,

Second Edition, 2004.

2. Anil K. Jain, , Fundamentals of Digital Image Processing', Pearson 2002.

**REFERENCES**

1. Kenneth R. Castleman, Digital Image Processing, Pearson, 2006.

2. Rafael C. Gonzalez, Richard E. Woods, Steven Eddins,' Digital Image Processing

using MATLAB', Pearson Education, Inc., 2004.

3. D,E. Dudgeon and RM. Mersereau, , Multidimensional Digital Signal Processing',

Prentice Hall Professional Technical Reference, 1990.

4. William K. Pratt, , Digital Image Processing' , John Wiley, New York, 2002

5. Milan SonkaetaI, 'IMAGE PROCESSING, ANALYSIS AND MACHINE VISION',

Brookes/Cole, Vikas Publishing House, 2nd edition, 1999,