

AMTC15 DIGITAL IMAGE PROCESSING

UNIT-1 CONTINUOUS IMAGE MATHEMATICAL CHARACTERIZATION

- 1.1 Image Representation, Two-Dimensional Systems,
- 1.2 Two-Dimensional Fourier Transform, Image Stochastic Characterization

UNIT-2 PSYCHOPHYSICAL VISION PROPERTIES

- 2.1 Light Perception, Eye Physiology, Visual Phenomena,
- 2.2 Monochrome Vision Model, Color Vision Model

UNIT-3 PHOTOMETRY AND COLORIMETRY

- 3.1 Photometry, Color Matching, Colorimetry Concepts,
- 3.2 Tristimulus Value Transformation

UNIT-4 IMAGE SAMPLING AND RECONSTRUCTION

- 4.1 Image Sampling And Reconstruction Concepts,
- 4.2 Image Sampling Systems, Image Reconstruction Systems

UNIT-5 DISCRETE IMAGE MATHEMATICAL CHARACTERIZATION

- 5.1 Vector-Space Image Representation,
- 5.2 Generalized Two-Dimensional Linear Operator, Image Statistical Characterization,
- 5.3 Image Probability Density Models, Linear Operator Statistical Representation

UNIT-6 IMAGE QUANTIZATION

- 6.1 Scalar Quantization, Processing Quantized Variables,
- 6.2 Monochrome And Color Image Quantization

UNIT-7 SUPERPOSITION AND CONVOLUTION

- 7.1 Finite-Area Superposition and Convolution, Sampled Image Superposition And Convolution,
- 7.2 Circulant Superposition And Convolution,
- 7.3 Superposition And Convolution Operator Relationship

UNIT-8. UNITARY TRANSFORMS

- 6.1 General unitary transforms, Fourier transform, cosine, sine, and Hartley transforms, hadamard, haar, and daubechies transforms, karhunen-loeve transform

UNIT-9 IMAGE ENHANCEMENT

- 9.1 Contrast Manipulation, Histogram Modification, Noise Cleaning, Edge Crispening,
- 9.2 Color Image Enhancement, Multispectral Image Enhancement

UNIT-10 IMAGE RESTORATION MODELS

- 10.1 General Image Restoration Models, Optical Systems Models,
- 10.2 Photographic Process Models, Discrete Image Restoration Models

UNIT-11 MORPHOLOGICAL IMAGE PROCESSING

- 11.1 Binary Image Connectivity, Binary Image Hit Or Miss Transformations,
- 11.2 Binary Image Shrinking, Thinning, Skeletonizing, And Thickening,
- 11.3 Binary Image Generalized Dilation And Erosion,
- 11.4 Binary Image Close And Open Operations, Gray Scale Image Morphological Operations

UNIT-12 EDGE DETECTION

- 12.1 Edge, line, and spot models, first-order derivative edge detection, second-order derivative edge detection, edge-fitting edge detection,
- 12.2 Luminance edge detector performance, color edge detection, line and spot detection

UNIT-13 IMAGE FEATURE EXTRACTION

- 13.1 Image feature evaluation, amplitude features, transform coefficient features, texture definition, and visual texture discrimination

Reference Books:

1. Digital Image Processing by Gonzalez and Woods
2. Digital Image Processing”by William K Pratt

