



STANLEY
COLLEGE OF ENGINEERING & TECHNOLOGY FOR WOMEN
(Approved by AICTE , New Delhi | Affiliated to Osmania University ,Hyderabad)
Address : Chapel Road, Abids ,Hyderabad

CS 413

IMAGE PROCESSING
(Elective - I)

Unit – I

Introduction to Digital Image Processing, Origins and Applications of Digital Image Processing, Fundamental steps in Digital Image Processing, Components of Digital Image Processing System, Elements of Visual Perception, Light and the Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization.

Unit – II

Filtering in the Frequency Domain: Preliminary Concepts, Sampling and the Fourier Transform of Sampled Functions, The Discrete Fourier Transform (DFT) of one Variable, Extension to Function Two Variables, Some Properties of the 2-D Discrete Fourier Transform, Image Smoothing and Sharpening using Frequency Domain Filters.

Unit – III

Intensity Transformations and Spatial Filtering: Histogram Processing, Fundamental of Spatial Filtering, Smoothing and Sharpening Spatial Filters
Image Segmentation: Point, Line and Edge Detection, Thresholding, Region-Based Segmentation.

Unit – IV

Image Compression: Fidelity Criteria, Image Compression Models, Image Formats, Containers and Compression Standards, Compression Methods: Huffman Coding, Golomb Coding, Arithmetic Coding, LZW Coding, Run-Length Coding.

Unit – V

Restoration: Noise Models, Inverse filtering, Least squares Filtering.
Introduction to Color Image Processing and Video Processing.

Suggested Reading:

1. Gonzalez R.C., Woods R.E: *Digital Image Processing*, Pearson Education, Third Edition 2008.
2. William K. Pratt, “*Digital Image Processing*”, John Wiley & sons Inc. 3rd Edition, 2001.

3. McAndrew, *Introduction to Digital Image Processing*, Cengage Learning 2004.
4. Sonka, Hlavac, Boyle, *Digital Image Processing and Computer Vision*, Cengage Learning, 2008.
5. Rosenfeld A. Kak AC., *Digital Picture Processing Vol. I & II* Acad, Press, 2nd Edition, 1982.

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