DIGITAL IMAGE PROCESSING

Course Code: 13EC1131

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Course Educational Objectives:

✤ To understand theoretical foundations of digital image processing;
✤ To appreciate modern applications; and,
✤ To study various techniques of image enhancement, restoration, compression and segmentation.

Course Outcomes:

At the end of this course, the student should be able to know

✤ The fundamentals of image processing.
✤ Various transforms used in image processing.
✤ About the various techniques of image enhancement, restoration, compression and segmentation.

UNIT-I (12 Lectures)
INTRODUCTION:
Digital image fundamentals, Concept of gray levels, Applications of image processing, Image Sensing and Acquisition, Image Sampling and Quantization, Gray level to binary image conversion, Relationships between pixels.

UNIT-II (12 Lectures)
IMAGE TRANSFORMS:

UNIT-III (15 Lectures)
IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN:
Point processing, Histogram processing, Spatial filtering.
IMAGE ENHANCEMENT IN THE FREQUENCY DOMAIN:
Image smoothing, Image sharpening, Homomorphic Filtering.

UNIT-IV  (12 Lectures)
COLOR IMAGE PROCESSING:
Color models, Pseudo color image processing, full color image processing.

IMAGE RESTORATION:
Degradation model, Algebraic approach to restoration, Inverse filtering, Least mean square filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT-V  (15 Lectures)
IMAGE COMPRESSION:
Redundancies and their removal methods, Fidelity criteria, Image compression models, Source encoder and decoder, Error free compression, Lossy compression.

IMAGE SEGMENTATION:
Detection of discontinuities, Edge linking and boundary detection, Thresholding, Region oriented segmentation.

TEXT BOOKS:

REFERENCES: