

GUJARAT UNIVERSITY

K. S. SCHOOL OF BUSINESS MANAGEMENT
[Five Years' (Full-time) Integrated Degree Course]

Semester-9 [M.Sc. (CA & IT)]

Subject Code: - KS_C_EC - 591

Subject Name: - Image Processing

Course Credit: - 3

Objective:

Give the students a general understanding of the fundamentals of digital image processing, understanding the different types of images, converting into digital form, and performing various operations for enhancement and restoration.

Unit No.	Course Content	Weight-age (%)
1	Introduction to digital image processing, electromagnetic spectrum, fields using Digital Image Processing, Fundamental Steps in Digital Image Processing, Components of an Image Processing System Structure of Human Eye, Image Formation in Eye, Light and Electromagnetic Spectrum, Image Sensing and Acquisition , Image Sampling and Quantization, Basic Relationship between pixels, Linear and Non-linear operations	(20%)
2	Background of transformation functions, some basic gray level transformation functions, Histogram Processing, Enhancement using Arithmetic/Logic Operations, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters	(20%)
3	Introduction to Fourier Transform and Frequency Domain, Properties of Frequency domain, Smoothing Frequency Domain Filters, Sharpening Frequency Domain Filters Application areas of Digital Image Processing, Different File Formats.	(20%)
4	Image Degradation/Restoration Model, Noise Models, Restoration in the presence of Noise only-Spatial Filtering, Periodic Noise reduction by Frequency Domain Filtering, Estimating the Degradation Function, Inverse Filtering, Minimum mean square Error (Weiner) Filtering,	(20%)
5	Color Fundamentals, Color Models, Pseudocolor Image Processing, Basics of Full Color Image Processing, Color Transformations, Smoothing and Sharpening Fundamentals of image compression, types of redundancies, Image Compression Models	(20%)

Recommended Lecture Scheme: Approximately 40 to 45 hours in a semester

Recommended Practical Scheme: Not Applicable

Assignment: Minimum five assignments should be given.

Main Reference Books:

1. Digital Image Processing
R C Gonzalez and R E Woods
Second Edition, Pearson Education

Reference Books:

1. Fundamentals of Digital Image Processing
Anil K Jain, Prentice Hall India
2. Digital Image Processing and Analysis
B Chanda and D Dutta Majumdar Prentice Hall India

Chapter -wise coverage of syllabus from Text book:

Unit 1: Chapter 1 & 2

Unit 2: Chapter 3

Unit 3: Chapter 4

Unit 4: Chapter 5

Unit 5: Chapter 6 & 8