

2. DIGITAL IMAGE PROCESSING

Semester	Subject Code	Category	Lecture Hrs		Theory Hrs		Practical		Credits
			Per week	Per Sem	Per week	Per Sem	Per week	Per Sem	
V		Elective -III	5	75	5	75	0	0	3

COURSE OBJECTIVE

- The course provides the overviews learning about Digital image processing techniques and image enhancement, segmentation and color image processing techniques.

COURSE OUTCOME

. On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level (K1-K4)
CO1	Learning the fundamental concepts of Digital image processing techniques	K1
CO2	To familiarize the student with the concept image enhancement techniques	K2
CO3	Analyze the technique of Image restoration process	K3
CO4	Understand and learn the importance of color image processing	K2
CO5	To learn the concept of image compression and image segmentation techniques	K4

Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze

MAPPING WITH PROGRAMME OUTCOME

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M	M	S	M	S	S
CO2	L	S	M	M	S	M
CO3	S	M	S	M	S	S
CO4	S	S	M	S	M	M
CO5	M	S	S	M	M	M

S-Strong,

M-Medium and

L-Low

SYLLABUS

UNIT 1 DIGITAL IMAGE FUNDAMENTALS

14 Hrs

Light and Electromagnetic spectrum, Components of Image processing system, Image formation and digitization concepts, Neighbours of pixel adjacency connectivity, regions and boundaries, Distance measures, Applications.

UNIT 2 IMAGE ENHANCEMENTS

15Hrs

Image Enhancements: In spatial domain: Basic gray level transformations, Histogram processing, Using arithmetic/Logic operations, smoothing spatial filters, Sharpening spatial filters. In Frequency domain: Introduction to the Fourier transform and frequency domain concepts, smoothing frequency- domain filters, Sharpening frequency domain filters.

UNIT 3 IMAGE RESTORATION

14Hrs

Various noise models, image restoration using spatial domain filtering, image restoration using frequency domain filtering, Estimating the degradation function, Inverse filtering.

UNIT 4 COLOUR IMAGE PROCESSING

15Hrs

Colour fundamentals, Colour models, Colour transformation, Smoothing and Sharpening, Colour segmentation

UNIT 5 IMAGE COMPRESSION AND IMAGE SEGMENTATION 15Hrs

Introduction, Image compression model, Error-free compression, Lossy compression. Detection of discontinuities, Edge linking and boundary detection, thres holding

Distribution of Marks: Theory 75% and Applications 25%

TEXT BOOKS

S.No	Author	Title	Publisher	Year of Publication
1	Rafel C. Gonzalez and Richard E. Woods	Digital Image Processing	Pearson Education	2015
2	Bhabatosh Chanda and Dwijesh Majumder	Digital Image Processing	Publisher : PHI	2016

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S.No	Author	Title	Publisher	Year of Publication
1	Rafel C. Gonzalez and Richard E. Woods	Fundamentals of Digital Image Processing	Publisher : PHI	2015
2	Anil K Jain	Digital Image Processing Using Matlab	Pearson Education	2016
3	Kenneth R Castleman	Digital Image Processing	Pearson Education	2007
4	S Jayaraman, S Esakkirajan, T Veerakumar	Digital Image Processing	McGraw Hill	2009
5	Jonathan M. Blackledge	Digital Image Processing	Woodhead Publishers	2005
6	Bhabatosh Chanda and Dwijesh Majumder	Digital Image Processing	Publisher : PHI	2016
7	Dr. Sanjay Sharma	Digital Image Processing	Pearson Education	2017
8	S.Annaduarai, R.Shanmugalakshmi	Fundamentals of Digital Image Processing	Pearson Education	2006

WEB RESOURCES

1. <https://www.tutorialspoint.com/dip/index.htm>
2. <https://www.javatpoint.com/digital-image-processing-tutorial>

TEACHING METHODOLOGY

- Class room teaching.
- Group discussions
- Seminars
- Demo using systems
- Chart/Assignment
- Simulation Model
- Smart Class room

SYLLABUS DESIGNER

1. Mrs. G.SANGEETHA LAKSHMI, Assistant Professor and Head, Dept of Computer Applications.
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