

## 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	21CCS5Da	Elective - II	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*

**UNIT 1: DIGITAL IMAGE FUNDAMENTALS****14 Hours**

Light and Electromagnetic spectrum - Components of Image processing system - Image formation and digitization concepts - Neighbors of pixel - Adjacency connectivity - Regions and boundaries, Distance measures, Applications.

**UNIT 2: IMAGE ENHANCEMENTS****15 Hours**

Image Enhancements: 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****14 Hours**

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****15 Hours**

Color fundamentals - Color models - Color transformation - Smoothing and Sharpening - Color segmentation

**UNIT 5: IMAGE COMPRESSION AND IMAGE SEGMENTATION****15 Hours**

Introduction - Image compression model - Error-free compression - Lossy compression - Detection of discontinuities - Edge linking and boundary detection - Thresholding

**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

## REFERENCE BOOKS

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	2010
4	S Jayaraman, S Esakkirajan,T Veerakumar	Digital Image Processing	McGraw Hill	2009
5	Jonathan M. Blackledge	Digital Image Processing	Woodhead Publishers	2011
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	2008

## WEB RESOURCES

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

## TEACHING METHODOLOGY

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

## SYLLABUS DESIGNER

- Mrs.G.SANGEETHA LAKSHMI, Assistant Professor & HOD, Dept of Computer Science & Applications
- Mrs.M MARIA MADHANA, Assistant Prof, Dept of Computer Science & Applications