PVP-19

DIGITAL IMAGE PROCESSING

Course Code	19EC4602B	Year	III	Semester	II
Course Category	Program Elective-III	Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Nil
Continuous Internal Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	Describe and explain basic operations of digital image processing. (L2)
CO2	Analyse and Design image processing algorithms (L4).
CO3	Implement image processing algorithms. (L4).
CO4	Apply the image processing algorithms in practical applications. (L3)

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)

Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation

* - Average value indicates course correlation strength with mapped PO

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1		1								2	
CO2	2	2	2	2	1								2	
CO3	2	2	2	2	3								2	
CO4	2	2	2	2	2	1		1	1		1	1	2	
Average* (Rounded to nearest integer)	2	2	2	2	2	1		1	1		1	1	2	

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Digital Image fundamentals:** Digital Image Representation, Fundamental steps in image processing, Concept of gray levels. Gray level to binary image conversion, Sampling and quantization, Resolution, Relationship between pixels. **Image Transforms:** 2-D discrete fourier transform and its Properties, Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Slant transform, Hotelling transform.	CO1, CO2, CO4
II	**Image Enhancement in Spatial Domain:** Point processing, Histogram processing, Image smoothing & Image sharpening. **Image Enhancement in frequency Domain:** Steps involved in frequency domain filtering, Image smoothing & Image sharpening.	CO1, CO2, CO3, CO4
III	**Image compression:** Redundancies and their removal methods, Fedility criteria, Image compression models, lossy and lossless compression.	CO1,CO2, CO3, CO4

IV	**Image segmentation:** Detection of discontinuities, edge linking and boundary detection, thresholding, region – oriented segmentation.	CO1, CO2, CO3, CO4
V	**Colour image processing**: Colour fundamentals, Colour models, Pseudo colour image processing, full colour image processing	CO1, CO2, CO3, CO4

Learning Resources
Text Books
1. Digital Image processing – R.C. Gonzalez & R.E. Woods, Addison Wesley/ Pearson education, 3rd Edition, 2002.
Reference Books
1. Fundamentals of Digital Image processing – A.K.Jain, PHI. 1989 2. Digital Image processing- S Jayaraman, S Esakkirajan and T. Veerakumar. TMH, 3rd Edition, 2010. 3. Digital Image Processing – William K. Pratt, John Wilely, 3rd Edition, 2004. 4. The Essential Guide to Image Processing-Alan c. Bovik, Academic Press, 2009.
e- Resources & other digital material
1. 1. http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT-KANPUR/ Digi_Img_Pro /ui/TOC.htm 2. http://nptel.iitm.ac.in/video.php?subjectId=117105079 3. http://en.wikipedia.org/wiki/Digital_image_processing. 4. http://www.filestube.com/d/digital+image+processing+gonzalez+solution.
