DIGITAL IMAGE PROCESSING

Course Code	20EC4701A	Year	IV	Semester	I
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	Understand the fundamentals and advances in Machine vision. (L2)
CO2	Apply the mathematical knowledge for image analysis(L3)
CO3	Analyse various image processing algorithms (L4).
CO4	Apply the image processing algorithms to real time 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	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3									2			3	
CO2	3									3			3	
CO3		3								3			3	
CO4	3									3			3	
Average * (Rounded to nearest integer)	3	3								3			3	

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Digital Image fundamentals:** Digital Image Representation, Fundamental steps in image processing, Concept of grey levels. Grey level to binary image conversion, Sampling and quantization, Resolution, Relationship between pixels.	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-CO4
III	**Image compression:** Redundancies and their removal methods, Fedility criteria, Image compression models, lossy and lossless compression.	CO1- CO4
IV	**Image segmentation:** Detection of discontinuities, edge linking and boundary detection, thresholding, region – oriented segmentation.	CO1- CO4
V	**Colour image processing:** Colour fundamentals, Colour models, Pseudo colour image processing, full colour image processing	CO1- CO4

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Learning Resources
Text Books
1. Digital Image processing – R.C. Gonzalez & R.E. Woods, Addison Wesley/ Pearson education, 3rd Ed., 2002. 2. Digital Image processing- S Jayaraman, S Esakkirajan and T. Veerakumar. TMH, 3rd Ed., 2010
Reference Books
1. Digital Image Processing – William K. Pratt, John Wilely, 3rd Ed., 2004. 2. The Essential Guide to Image Processing-Alan c. Bovik, Academic Press, 2009. 3. Fundamentals of Digital Image processing – A.K.Jain, PHI. *1995*
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.
