

<b>DIGITAL IMAGE PROCESSING</b> <b>[As per Choice Based Credit System (CBCS) scheme]</b> <b>(Effective from the academic year 2017 - 2018)</b> <b>SEMESTER – VII</b>			
Subject Code	17CS753	IA Marks	40
Number of Lecture Hours/Week	3	Exam Marks	60
Total Number of Lecture Hours	40	Exam Hours	03
CREDITS – 03			
Module – 1			Teaching Hours
<b>Introduction</b> Fundamental Steps in Digital Image Processing, Components of an Image Processing System, Sampling and Quantization, Representing Digital Images (Data structure), Some Basic Relationships Between Pixels- Neighbors and Connectivity of pixels in image, Applications of Image Processing: Medical imaging, Robot vision, Character recognition, Remote Sensing.			8 Hours
Module – 2			
<b>Image Enhancement In The Spatial Domain:</b> Some Basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic/Logic Operations, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters, Combining Spatial Enhancement Methods.			8 Hours
Module – 3			
<b>Image Enhancement In Frequency Domain:</b> Introduction, Fourier Transform, Discrete Fourier Transform (DFT), properties of DFT , Discrete Cosine Transform (DCT), Image filtering in frequency domain.			8 Hours
Module – 4			
<b>Image Segmentation:</b> Introduction, Detection of isolated points, line detection, Edge detection, Edge linking, Region based segmentation- Region growing, split and merge technique, local processing, regional processing, Hough transform, Segmentation using Threshold.			8 Hours
Module – 5			
<b>Image Compression:</b> Introduction, coding Redundancy , Inter-pixel redundancy, image compression model, Lossy and Lossless compression, Huffman Coding, Arithmetic Coding, LZW coding, Transform Coding, Sub-image size selection, blocking, DCT implementation using FFT, Run length coding.			8 Hours
<b>Course outcomes:</b> The students should be able to:			
<ul style="list-style-type: none"> <li>• Explain fundamentals of image processing</li> <li>• Compare transformation algorithms</li> <li>• Contrast enhancement, segmentation and compression techniques</li> </ul>			
<b>Question paper pattern:</b> The question paper will have ten questions. There will be 2 questions from each module. Each question will have questions covering all the topics under a module. The students will have to answer 5 full questions, selecting one full question from each module.			
<b>Text Books:</b> 1. Rafael C G., Woods R E. and Eddins S L, Digital Image Processing, Prentice Hall, 3 <sup>rd</sup> edition, 2008.			
<b>Reference Books:</b>			

1. Milan Sonka, "Image Processing, analysis and Machine Vision", Thomson Press India Ltd, Fourth Edition.
2. Fundamentals of Digital Image Processing- Anil K. Jain, 2nd Edition, Prentice Hall of India.
3. S. Sridhar , Digital Image Processing, Oxford University Press, 2<sup>nd</sup> Ed, 2016.