PEI8J001 DIGITAL IMAGE PROCESSING

University level: 80%

Module: 1 (12 hours)

Introduction: Digital Image fundamentals: Image sensing and acquisition, Image sampling and quantization, relationship between pixels, Intensity transformations and spatial filtering, some basic intensity transformation functions, Histogram processing, spatial filters for smoothing and sharpening (Chapt: 2 & 3 of Text book 1)

Module: 2 (12 hours)

Filtering in the Frequency Domain: preliminary concepts, 2D DFT and its properties, basic filtering in the frequency domain, image smoothing and sharpening (Chapt: 4 of Text book 1)
Image Restoration and Reconstruction: Image restoration/degradation model, noise models, restoration in the presence of noise only, estimating the degradation function (Chapt: 5 of Text Book 1)

Module: 3 (12 hours)

Color Image Processing: color models, Color transformation (Chapt: 6 of Text book 1). Wavelets and Multi-resolution Processing: multiresolution expansions, wavelet transforms in one and two dimension (Chapt: 7 of Text book 1)

Module: 4 (12 hours)

Image Compression: Fundamentals, Error-free compression: variable length coding, LZW coding. Lossy compression: lossy predictive coding (Chapt: 8 of Text book 1)
Morphological Image Processing: Erosion and Dilation, opening and closing (Chapt: 9 of Text book 1)

Text Books:

1. R.C. Gonzalez, R.E. Woods, *Digital Image Processing*, 3rd Edition, Pearson Education
2. R C Gonzalez, Woods and Eddins, *Digital Image Processing using Matlab*, 2nd Edition, Tata McGraw Hill

Reference Books:

1. *S.Sridhar, Digital Image Processing, Oxford University Press, 2011*