Course Code	CSE340/CSE540/ECE340
Course Name	Digital Image Processing
Credits	4
Course Offered to	UG/PG
Course Description	Course includes fundamental theories and algorithms of digital image acquisition, color representation, sampling and quantization, frequency transform via DFT, enhancement, filtering, restoration, analysis, feature extraction, segmentation, morphological transform, and compression. Practical applications such as JPEG compression will be covered.

Pre-requisites		
Pre-requisite (Mandatory)	Pre-requisite (Desirable)	Pre-requisite(other)
MTH100 Maths I	ECE250 Signals & Systems	
MTH201 Probability & Statistics		

*Please insert more rows if required

Post Conditions*(For suggestions on verbs please refer the second sheet)				
CO1	**CO2**	**CO3**	**CO4**	**CO5**
Students are be able to demonstrate an understanding of fundamental spatial domain image processing	Students are be able to analyze image transforms	Students are be able to apply image processing techniques in spatial and Fourier domain.	Students are be able to analyze spatial and frequency domain properties for compression	Student are be able to examine feature representation and segmentation

Weekly Lecture Plan

Week Number	**Lecture Topic**	**COs Met**	**Assignment/Labs/Tutorial**
1	Introduction -Imaging Systems -Applications	CO1	
2	Digital image fundamentals - Human visual system - Digital Image Formation - Sampling and Quantization - Interpolation - Geomteric Transformation	CO1,CO3	Assignment - Analytical + Practical
3&4	Image processing theory and practice - Registration - Intensity transformation - Histogram processing - Convolution - Spatial filtering	CO1,CO3	Lab exercise
5&6	- Fourier transform - Convolution - Sampling and reconstruction - Aliasing - DFT	CO2, CO3,CO4	Assignment - Analytical + Practical
7&8	DFT Properties Filtering in frequency domain	CO2, CO3,CO4	Assignment - Analytical + Practical

9	Image Restoration - Noise models - Linear and non-linear filters - Wiener filtering - Constrained least squares filtering - Reconstruction (if time permits)	CO1,CO2,CO3	Lab exercise
10	Color Image Fundamentals	CO1	Assignment - Analytical + Practical
11	DCT and Image Compression	CO2,CO2,CO4	
12	Morphological Image Processing	CO1,C05	Assignment - Analytical + Practical
13	Image Segmentation - Point, line and edge detection - Thresholding	CO1,CO5	

*Please insert more rows if required

Weekly Lab Plan			
Week Number	**Laboratory Exercise**	**COs Met**	**Platform (Hardware/Software)**

*Please insert more rows if required

Assessment Plan	
Type of Evaluation	% Contribution in Grade
Quiz	20
Assignment	20
Mid-sem	15
End-sem	25
Project	20

*Please insert more row for other type of Evaluation

Resource Material	
Type	**Title**
Textbook	Gonzalez and Woods, Digital Image Processing, 3rd edition, Prentice Hall, 2008