School of Information Technology
International Business College

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Digital Image Processing

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Aim of Unit:

This unit provides concepts and methodologies for digital image processing and computer vision analysis. This unit consists of image fundamentals, image enhancement in the spatial and frequency domains, restoration, color image processing, wavelets, image compression, morphology, segmentation, image description, and the fundamentals of object recognition. It focuses on material that has a broad scope of application.

Unit Outline:

- Introduction to Digital Image Processing
- Digital Image Fundamentals.
- Image Enhancement in the Spatial Domain.
- Image Enhancement in the Frequency Domain.
- Image Restoration.
- Color Image Processing.
- Wavelets and Multiresolution Processing.
- Image Compression.
- Morphological Image Processing.
- Image Segmentation.
- Representation and Description.
- Object Recognition.

Mode of Delivery:

Two hours lecture per week.
One hour tutorial per week.

Unit Assessment:

Assignments, Laboratories	20 %
Mid-Semester Test	20 %
Final Examination	60 %

Assessment Requirements:

Students must receive 50% or more for each component of Unit Assessment in order to pass the subject.

Student Workload:

Students will have 3 hours per week face-to-face learning during semester. Students are expected to work at least 5 hours per week out of class.

Text Book:

1. Rafael C. Gonzalez and Richard E. Woods, "Digital Image Processing", 2nd edition, Prentice Hall, 2002

Recommended References:

1. Linda G. Shapiro and George C. Stockman, "Computer Vision", Prentice Hall, 2001
2. J. R. Parker**,** "Algorithms for Image Processing and Computer Vision", Wiley, 1996

Subject Schedule

Weeks	Lecture/Tutorial Topics	Assignments/ Laboratories	Reading from Text Book
1	Introduction to Digital Image Processing	Assignment #1	Chapter 1
2	Digital Image Fundamentals	Lab #1	Chapter 2
3	Image Enhancement in the Spatial Domain	Assignment #2	Chapter 3
4	Image Enhancement in the Frequency Domain	Lab #2	Chapter 4
5	Image Restoration	Assignment #3	Chapter 5
6	Color Image Processing	Lab #3	Chapter 6
7	**Mid-Semester Test** Wavelets and Multiresolution Processing		Chapter 7
8	Image Compression	Assignment #4	Chapter 8
9	Morphological Image Processing	Lab #4	Chapter 9
10	Image Segmentation	Assignment #5	Chapter 10
11	Representation and Description	Lab #5	Chapter 11
12	Object Recognition	Assignment #6	Chapter 12
13	Revision		
14	**Final Examination**		