Digital Image Processing (Elective)

Course # COMP 4075

Credits 6

Prerequisites and/or Corequisites: Programing 1, Linear Algebra

Course Description

Digital Image Processing is a fundamental course that explores the techniques and algorithms used to manipulate, enhance, and analyze digital images. This course covers both theoretical foundations and practical applications of image processing in various fields, including computer vision, medical imaging, remote sensing, and multimedia. Students will learn about image representation, enhancement, restoration, compression, segmentation, feature extraction, and recognition.

Course Learning Outcomes

Upon the completion of this course, students will be able to:

- Understand digital image representation, acquisition, and pixel characteristics.
- Apply techniques like histogram equalization, contrast stretching, and filtering for image enhancement.
- Implement restoration methods to recover degraded images from noise and blurring.
- Employ thresholding, edge detection, and feature extraction for image segmentation and analysis.
- Learn lossless and lossy compression techniques for efficient image storage and transmission.
- Evaluate time and space complexity of algorithms and compare them to select optimal solutions.
- Apply image processing to various fields like medical imaging and computer vision.
- Develop problem-solving skills through hands-on projects and practical exercises.

Course Assessments and Grading

Item	**Weight**
Attendance & Activities	10%
Assignment (5 assignments)	20%
Quizzes (5 quizzes)	20%
Midterm exam (exam + project)	20%
Final exam (exam + project)	30%