Course Outline

Course Code: CSE 419
Course Title: Image Processing
Course Teacher: Md. Manirujjaman

Week	Topics	Lecture Outcomes	Teaching–Learning Methods
Week 1	Introduction: Digital image concept, purpose of image processing, image processing environment, types of imaging, fundamental steps, types of images, image formats	Understand basic concepts of digital images and image processing workflow	Lecture, multimedia presentation, discussion
Week 2	Sampling & Quantization, Representation of Digital Image	Explain digitization process and image representation	Lecture, pictorial examples
Week 3	Spatial and Intensity Resolution, Image Interpolation	Analyze resolution effects and apply interpolation methods	Lecture, problem solving
Week 4	Pixel neighborhood, adjacency, connectivity, paths, boundary, boundary applications, distance measures	Identify pixel relationships and apply boundary concepts	Lecture, examples.
Week 5	Linear & nonlinear operations, arithmetic operations, spatial operations, thresholding, histogram, histogram equalization	Apply spatial domain operations and histogram techniques	Lecture, examples.
Week 6–7	Image quality factors, point processing, neighborhood processing, histogram	Enhance image quality using spatial domain	Lecture, Math examples.

	specification	techniques	
Week 8	Image Compression: Types of redundancy, Huffman coding, Arithmetic coding, Run-length coding	Understand and apply basic image compression techniques	Lecture, numerical examples
Week 9–10	Review and assessment	Revise and integrate all course concepts	Discussion, problem solving