Dept Number	CS 586	Course Title	Pattern Recognition and Image Processing
Semester Hours	3	Course Coordinator	Qiang Cheng
Catalog Description	An introduction to the area of computer vision for the purpose of restoration, segmentation, encoding, analysis, and recognition of pictures. Topics include: image transforms, edge detection, smoothing, filtering, pseudo-coloring, syntactic methods in scene analysis, parametric decision theory, non-parametric decision theory, linear discriminant functions, parameter estimation, supervised learning, and unsupervised learning.		

Textbooks

References

Course Learning Outcomes

Assessment of the Contribution to Program Outcomes

Outcome →	1	2	3	4	5	6	7	8	9	10
Assessed →	X	X	X	X	X		X			

Prerequisites by Topic

CS 220 and Math 380 or consent of instructor.

Major Topics Covered in the Course

1. Computer Representation and Display of Picture Data {3 classes}
2. Image Transforms {7 classes}
3. Image Enhancement {3 classes}
4. Image Encoding {3 classes}
5. Descriptive Methods in Scene Analysis {2 classes}
6. Restoration {4 classes}
7. Non Parametric Decision Theory {4 classes}
8. Linear Discriminant Functions {3 classes}
9. Statistical Discriminant Functions {6 classes}
10. Clustering and Non Supervised Learning {5 classes}

Major Lab Assignments and Projects

Assessment Plan for the Course

Tool 1. **Assignments:**

Assignment 1: O-1, O-2

Assignment 3: O-1, O-3

Assignment 6: O-1, O-4

Tool 2. **Machine Problem:**

Machine Problem: O-3, O-5, O-7

Tool 3. **Exams:**

Exam 1: O-1

Exam 2: O-2, O-4