### Dept Number
- CS 586

### Course Title
- Pattern Recognition and Image Processing

<table>
<thead>
<tr>
<th>Semester Hours</th>
<th>Course Coordinator</th>
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<tr>
<td>3</td>
<td>Qiang Cheng</td>
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### 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

<table>
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<tr>
<th>Outcome</th>
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<td>Assessed</td>
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### Assessment of the Contribution to Program Outcomes

### Prerequisites by Topic

- CS 220 and Math 380 or consent of instructor.

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<td>Major Topics Covered in the Course</td>
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</table>
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