Course Syllabus	**EECS 4330 - Image Analysis & Computer Vision**
Credits & Contact hours	3 credit hours & two 75-minute lecture contact hours per week.
Coordinator	Dr. Ezzatollah Salari
Textbook	R. C. Gonzalez, R. E. Woods, Digital Image Processing, Prentice Hall 2008.
Course Information	Imaging geometry, image filtering, segmentation techniques, image representation and description, stereo vision and depth measurements, texture analysis, dynamic vision and motion analysis, matching and recognition. Prerequisites: EECS 3210 and EECS 3300 Elective Course
Specific Goals - Student Learning Objectives	The students will be able to 1. implement various image processing algorithms. 2. design various image filtering techniques including median filtering, and Gaussian smoothing. 3. perform various image segmentation techniques and edge detection. 4. design algorithms for contour and region representations. 5. devise techniques for stereo vision and depth measurements. 6. evaluate and measure texture information. 7. analyze dynamic scenes. 8. perform feature extraction and object recognition.

Topics	1. Introduction, Elements of Image Processing Systems
	2. Imaging Geometry
	3. 2-D and 3-D Transformations
	  a. Perspective Transformation
	  b. Stereo Imaging
	4. Image Enhancement
	  a. Contrast Stretching
	  b. Histogram Processing
	  c. Image Subtraction and Image Averaging
	  d. Smoothing Filters and Median Filtering
	  e. Image Sharpening
	5. Image Segmentation
	  a. Thresholding

    b. Edge Detection
    c. Hough Transform
6. Representation and Description
    a. Representation Schemes
    b. Boundary Descriptors
    c. Regional Descriptors
7. Motion Analysis
    a. Focus of Expansion
    b. Optical Flow
8. Correspondence Problem
    a. Interpretation
    b. Recognition Techniques