

University of Puerto Rico
 Mayagüez Campus
 College of Engineering
 Department of Electrical and Computer Engineering
 Graduate Program in Electrical Engineering

Course Syllabus

1. General Information:	
Alpha-numeric codification: INEL 6088 Course Title: Computer Vision Number of credits: 3 Contact Period: 3 hours per week	
2. Course Description:	
English: Introduction to Computer Vision. Computer Vision Systems. Biological Vision System and Biological Signal Processing; Early Image Processingboundary Detection; Region Growing; Texture and Shape Analysis.	
Spanish: Introduccion A la Vision Por Computadoras. Sistemas Para la Vision Porcomputadoras. Sistema de la Vision Biologica y el Procesamiento Biologico de Senales. Procesamiento de Los Atributos Primarios de Una Imagen; Deteccion de Contornos; Crecimiento de Regiones; Analisis de Texturas y Formas.	
3. Pre/Co-requisites and other requirements:	
4. Course Objectives:	
After completing this course the student should: Explain basic concepts and techniques of machine vision; Be able to develop a prototype of machine vision algorithms using MATLAB; Describe machine and computer vision applications.	
5. Instructional Strategies:	
<input checked="" type="checkbox"/> conference <input checked="" type="checkbox"/> discussion <input type="checkbox"/> computation <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> seminar with formal presentation <input type="checkbox"/> seminar without formal presentation <input type="checkbox"/> workshop <input type="checkbox"/> art workshop <input type="checkbox"/> practice <input type="checkbox"/> trip <input type="checkbox"/> thesis <input type="checkbox"/> special problems <input type="checkbox"/> tutoring <input type="checkbox"/> research <input checked="" type="checkbox"/> other, please specify: perform design exercises and projects , class design project presentation	
6. Minimum or Required Resources Available:	
Materials, equipment, and physical facilities needed to fulfill the course objectives.	
7. Course time frame and thematic outline	
Outline	Contact Hours
Course Introduction	1
Machine vision systems: Illumination, Camera and lenses selection, and positioning devices.	4
Introduction to Geometrical Optics	3
Binary Image Processing	4
Regions	5
Image Filtering	6

Edge detection	6
Contours and region representation	4
Shading	3
Stereo Vision	3
Photometric stereo	
Camera calibration	4
Total hours: (equivalent to contact period)	

8. Grading System

Quantifiable (letters) Not Quantifiable

9. Evaluation Strategies

	Quantity	Percent
<input checked="" type="checkbox"/> Exams	1	15%
<input checked="" type="checkbox"/> Final Exam	1	15%
<input type="checkbox"/> Short Quizzes		
<input checked="" type="checkbox"/> Oral Reports		10%
<input type="checkbox"/> Monographies		
<input type="checkbox"/> Portfolio		
<input checked="" type="checkbox"/> Projects	1	30%
<input type="checkbox"/> Journals		
<input checked="" type="checkbox"/> Other, specify: Laboratory Exercises and Homework		30%
TOTAL:		100%

10. Bibliography:

-Forsyth, David A., and Ponce, Jean, Computer Vision: A Modern Approach, Prentice Hall 2003
 -Shapiro G. Linda, and Stockman, Geroge, Computer Vision, Prentice Hall 2001
 -Jain, R., Kasturi R. and Schunck, B.G., Machine Vision, McGraw-Hill, Inc. 1995
 -M. Sonka, V. Hlavac, R. Boyle, Image Processing, Analysis, and Machine Vision, Engineering-Nelson, 2007.
 -W.E. Snyder, H. Qi, Machine Vision, Cambridge University Press, 2004.

11. According to Law 51

Students will identify themselves with the Institution and the instructor of the course for purposes of assessment (exams) accommodations. For more information please call the Student with Disabilities Office which is part of the Dean of Students office (Chemistry Building, room 019) at (787)265-3862 or (787)832-4040 extensions 3250 or 3258.

Person who prepared this description and date of preparation:

Raul Torres, August 2007