Title:	**"Introduction to Computer Vision"**
Course catalog number:	ELEC 345/546, COMP 345/546 (Spring 2017)
Instructor:	Prof. Ashok Veeraraghavan, Rice University, (vashok (at) rice.edu)
Office Hours:	TBD
Class time:	Tuesday 4:00 – 5:15 PM Thursday 4:00 – 5:15 PM
Class location:	Herztein 210
TA sessions:	Monday 5:00 – 6:00 PM Wednesday 5:00 – 6:00 PM
TA session location:	TBD
Prerequisites:	Prior knowledge of undergraduate-level linear algebra is a plus, but the course is self-contained.
Textbook:	**Computer Vision: Algorithms and Applications** by Richard Szeliski This book is available for free download from the book's website.
Reference Textbooks:	**1.** **Computer Vision: A Modern Approach** by David Forsyth and Jean Ponce. **2.** **Multiple View Geometry in Computer Vision** by Richard Hartley and Andrew Zisserman. **3.** **Pattern Classification** by Richard O. Duda, Peter E. Hart and David G. Stork.
Software Skills:	Required: Matlab (A brief introduction will be given) Additional: C++, OpenCV (Not required but may help)
Additional Material:	CVOnline -- Compendium of Computer Vision Matlab primer by Kermit Sigmon

MATLAB tutorial (by David Kriegman and Serge Belongie)

More MATLAB tutorials: (by Martial Hebert at CMU)
basic operations, programming, working with images

Getting started with Matlab: basic tutorial (by Stefan Roth)

Linear algebra and Random variables (via David Kriegman)

Grading (subject to change):

Take Home Assignments (7)	-	65%
Mid Term Examination	-	15%
Final Examination in Class	-	5%
Final Examination Take Home	-	15%

Late Submissions:

Assignments are expected to be submitted on the due date. Each student gets a total of 3 late days that can be used however you wish. For examples, all 3 days can be used towards 1 assignment or 1 day late for 3 assignments or other combinations.

Late submissions beyond that will be penalized as below:

1. One day late will be penalized 25% of the credit.
2. Two Days late will be penalized 50%.
3. Submissions more than 2 days late will not be considered for credit.

I will be ruthless in enforcing this policy. There will be no exceptions.

Collaboration Policy:

I encourage collaboration both inside and outside class. You may talk to other students for general ideas and concepts but the programming must be done independently. For mid-term and final examination there will be no collaboration permitted.

Plagiarism:

Plagiarism of any form will not be tolerated. You are expected to credit all sources explicitly. If you have any doubts regarding what is and is not plagiarism, talk to me.

Updates to the Course:

Information contained in this course syllabus may be subject to change with reasonable advance notice as appropriate.

Introduction				
01	Jan 10, 2017	Introduction to Computer Vision and Sample Applications.		
02	Jan 12, 2017	Animal Eyes, Perception and Illusions Assignment0 release		
Photometry (Image Processing, Feature Extraction)				
03	Jan 17, 2017	Linear filters and Edge detection		
04	Jan 19, 2017	Feature extraction (Harris + SIFT)		
05	Jan 24, 2017	Feature Extraction 2 Assignment1 release		
06	Jan 26, 2017	Model Fitting and RANSAC		
07	Jan 31, 2017	Alignment		
08	Feb 02, 2017	Photometric tools (Gradient domain processing, Laplacian etc) Assignment2 release		
09	Feb 07, 2017	REVIEW AND DISCUSSION		
	Feb 09, 2017	Spring Break (No classes)		
Image Formation				
10	Feb 14, 2017	Cameras, Projection		
11	Feb 16, 2017	Projective Geometry and meteorology Assignment3 release		
12	Feb 21, 2017	Computational Photography		
13	Feb 28, 2017	REVIEW AND DISCUSSION		

3D Geometry				
14	Mar 02, 2017	Camera Calibration Assignment4 release		
15	Mar 07, 2017	Midterm Exam		
16	Mar 09, 2017	Stereo and Multi-view stereo		
	Mar 14&16	Midterm Recess (No Class)		
17	Mar 21, 2017	Structured Light and Kinect		
18	Mar 23, 2017	Structure from Motion Assignment5 release		
19	Mar 28, 2017	Light, Shading and Color (Material Properties)		
20	Mar 30, 2017	Photometric Stereo and Shape from Shading		
Recognition and Pattern Classification/Machine Learning Methods				
21	Apr 04, 2017	History and Overview Assignment6 release		
22	Apr 06, 2017	Recognition and Machine Learning		
23	Apr 11, 2017	Bags of features and part based models		
24	Apr 13, 2017	Face + Review and Discussion Assignment7 release		
Miscellaneous				
25	Apr 18, 2017	Motion (Tracking, Optical Flow)		
26	Apr 20, 2017	Photometry: Segmentation		