

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
INTRODUCTION to COMPUTER VISION	IND4147020	Fall Semester	3+0	3	6
<b>Prerequisites Courses</b>	LİNEER CEBİR VE DİFERANSİYEL DENKLEMLER				
<b>Recommended Elective Courses</b>					
<b>Language of Instruction</b>	English				
<b>Course Level</b>	First Cycle (Bachelor's Degree)				
<b>Course Type</b>	Elective				
<b>Course Coordinator</b>	Prof.Dr. Bahadır Kürşat GÜNTÜRK				
<b>Name of Lecturer(s)</b>	Prof.Dr. Bahadır Kürşat GÜNTÜRK				
<b>Assistant(s)</b>					
<b>Aim</b>	To understand the basic topics in computer vision and to apply and evaluate various computer vision techniques.				
<b>Course Content</b>	This course contains; Optical image formation, Imaging pipeline, Image filtering, Edge detection and Hough transform, Morphological operations, Image enhancement, Keypoint detection (basic ideas), Keypoint detection (scale invariant methods), Image interpolation, Geometric transformations, Motion estimation, Camera calibration, 3D vision, Color space.				
<b>Course Learning Outcomes</b>		<b>Teaching Methods</b>		<b>Assessment Methods</b>	
Understand and apply basic image processing techniques		1, 14, 15, 4		A, C	
Understand and apply image formation and modeling concepts		1, 14, 15, 2, 4		A, C	
Understand and apply mid-level computer vision techniques, including feature extraction and optical flow		1, 14, 15, 2, 4		A, C	
Design and evaluate solutions to computer vision problems		1, 14, 15, 2, 4		A, C	
<b>Teaching Methods</b>	1: Lecture, 14: Self-Study, 15: Problem solving, 2: Question - Answer, 4: Exercise, Practice				
<b>Assessment Methods</b>	A: Written Exam, C: Homework				
<b>Lecture Schedule</b>					
<b>Sequence</b>	<b>Topics</b>	<b>Preliminary Preparation</b>			
1	Optical image formation				
2	Imaging pipeline				
3	Image filtering				
4	Edge detection and Hough transform				
5	Morphological operations				
6	Image enhancement				
7	Keypoint detection (basic ideas)				
8	Keypoint detection (scale invariant methods)				
9	Image interpolation				
10	Geometric transformations				
11	Motion estimation				
12	Camera calibration				
13	3D vision				
14	Color space				
<b>Evaluation Methods</b>		<b>Weight(%)</b>			
Midterm Exam		30			
General Exam		70			

Resources
Sonka, Hlavac, and Boyle. "Image Processing, Analysis, and Machine Vision." Cengage Learning, 4th edition.