

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
INTRODUCTION to COMPUTER VISION	COE4147020	Fall Semester	3+0	3	6
Prerequisites Courses	LİNEER CEBİR VE DİFERANSİYEL DENKLEMLER; LİNEER CEBİR				
Recommended Elective Courses					
Language of Instruction	English				
Course Level	First Cycle (Bachelor's Degree)				
Course Type	Elective				
Course Coordinator	Prof.Dr. Bahadır Kürşat GÜNTÜRK				
Name of Lecturer(s)	Prof.Dr. Bahadır Kürşat GÜNTÜRK				
Assistant(s)					
Aim	To understand the basic topics in computer vision and to apply and evaluate various computer vision techniques.				
Course Content	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.				
Course Learning Outcomes		Teaching Methods		Assessment Methods	
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	
Teaching Methods	1: Lecture, 14: Self-Study, 15: Problem solving, 2: Question - Answer, 4: Exercise, Practice				
Assessment Methods	A: Written Exam, C: Homework				
Lecture Schedule					
Sequence	Topics	Preliminary Preparation			
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				
Evaluation Methods		Weight(%)			
Midterm Exam		30			
General Exam		70			

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