

COMPUTER VISION AND PATTERN RECOGNITION

1	Course Title:	COMPUTER VISION AND PATTERN RECOGNITION	
2	Course Code:	EEM4427	
3	Type of Course:	Optional	
4	Level of Course:	First Cycle	
5	Year of Study:	4	
6	Semester:	7	
7	ECTS Credits Allocated:	4.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	-	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Yrd.Doç.Dr. Ahmet Emir DİRİK	
15	Course Lecturers:	-	
16	Contact information of the Course Coordinator:	E-posta: edirik@uludag.edu.tr Tel: (224) 294 0655 Adres: Elektronik Mühendisliği Bölümü 4. Kat, No:425	
17	Website:	http://home.uludag.edu.tr/~edirik	
18	Objective of the Course:	<p>The main objectives of the course are as follows:</p> <p>To provide essential knowledge of computer vision and pattern recognition fundamentals.</p> <p>To develop advanced skills and competency in computer vision and pattern recognition discipline.</p> <p>To apply these skills to the full spectrum of computer vision and pattern recognition problems, through independent research and investigation.</p> <p>To develop the students' transferable skills including communication (oral, written and aural), time and project management.</p>	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	Gain sufficient knowledge on computer vision and pattern recognition field; the ability to model and solve computer vision and pattern recognition problems using theoretical and practical knowledge.
		2	Gain the ability to identify, model, and solve complex computer vision and pattern recognition problems; the ability to select and apply appropriate analysis and modeling methods for these problems.
		3	Gain the ability to design partly or fully a complex computer vision and pattern recognition system, process, device or a product meeting specific requirements under realistic constraints and conditions; the ability to apply modern design methods in this context.
		4	Gain the ability to develop, select, and use modern techniques and tools necessary for computer vision and pattern recognition applications; the ability to use information technologies in an efficient way.

		5	Gain the ability to design and conduct complex experiments and to collect, analyze and interpret data for computer vision and pattern recognition problems		
		6			
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21	Course Content:				
	Course Content:				
Week	Theoretical		Practice		
1	Projection geometry and perspective, mathematical fundamentals				
2	Geometric transformations, Affine transform and image processing application				
3	Curve and surface definition				
4	Edge definition and contour extraction				
5	2D digital filters and edge detection				
6	Segmentation, lighting and shadows				
7	Classification and recognition				
8	Deterministic and statistical learning, multi dimensional probability distribution functions				
Activites			Number	Duration (hour)	Total Work Load (hour)
11	Theoretical: Bayes, maximum likelihood learning methods and algorithms		14	3.00	42.00
Practicals/Labs			0	0.00	0.00
13	Self study and preparation: (k-neighbor) learning and		14	4.00	56.00
Homeworks			1	5.00	5.00
14	Projects: Competitive learning methods, Self-organizing-maps (SOM)		1	20.00	20.00
Field Studies			0	0.00	0.00
22	Midterm exams: Textbooks, References and/or Other Materials:		1	15.00	15.00
Others			0	0.00	0.00
Final Exams			2	27.00	54.00
Total Work Load					165.00
Total work load/ 30 hr			3	Pattern Recognition and Machine Learning (Information	5.50
ECTS Credit of the Course					4.00
			(Hall, 2007)		
23	Assesment				
TERM LEARNING ACTIVITIES		NUMBE R	WEIGHT		
Midterm Exam		1	30.00		
Quiz		0	0.00		
Home work-project		1	20.00		
Final Exam		1	50.00		
Total		3	100.00		
Contribution of Term (Year) Learning Activities to Success Grade			50.00		
Contribution of Final Exam to Success Grade			50.00		

Total									100.00							
Measurement and Evaluation Techniques Used in the Course																
24	ECTS / WORK LOAD TABLE															
25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
ÖK5	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low			2 low			3 Medium			4 High			5 Very High			