1.	Course Title	Machine Vision		
2.	Code	F18L3W123		
3.	Study program	Software engineering and information systems		
4.	Study Program Organizer	Faculty of Computer Science and Engineering		
5.	Degree (first, second, third cycle)	first cycle		
6.	Academic year / semester 4 / winter / optional	7. ECTS credits 6		
8.	Teacher	associate professor Ivica Dimitrovski, associate professor Andrea Kulakov, assistant professor Petre Lameski		
9.	Course enrollment prerequisites	Дигитално процесирање на слика или Машинско учење		
10.	Course program goals (competencies): The goal of this course is to introduce the students to the basic concepts and principles of computer vision. The students who will successfully finish the course will be able to design efficient systems for computer vision for handwriting recognition, detection and recognition of faces, movement detection, human and vehicle tracking, gesture recognition, classification and recognition of visual objects, scene analysis and understanding etc.			
11.	Course program content: Introduction to computer vision. Cameras and optics. Brightness and color. Pixels and filters. Image processing in frequency domain. Image pyramid. Machine learning: clustering and classification. Edge detection and line overlapping. Robust line overlapping (Hough transformation, RANSAC, etc.). Clustering and image segmentation. GMM (Gaussian Mixture Models). Points of interest detection. Feature tracking. Optical flow. Stereo correspondence. Scaling- and rotation-invariant feature transformation (SIFT, SURF). Visual words dictionaries. Recognition and classification of visual objects.			
12.	Learning methods: Lectures using presentations, interactive lectures, exercises (using equipment and software packages), teamwork, case studies, invited guest lecturers, independent preparation and defense of a project assignment and seminar work.			
13.	Total available time	180		
14.	Distribution of the available time	30 + 45 + 15 + 15 + 75 = 180 hours		
15.	Teaching activity forms	15.1.	Lectures – theoretical teaching	30 hours

		15.2.	Exercises (laboratory, auditory), seminar papers, teamwork	45 hours
16.	Other activity forms	16.1.	Project Tasks	15 hours
		16.2.	Independent Learning Tasks	15 hours
		16.3.	Home learning	75 hours

17.	Assessment methodology		
	17.1.	Tests	30 points
	17.2.	Seminar paper/project (presentation: written and oral)	40 points
	17.3.	Activity and learning	10 points
	17.4.	Final exam	20 points

18.	Assessment criteria (points/grade)	up to 50 points	5 (five) (F)
		51 to 60 points	6 (six) (E)
		61 to 70 points	7 (seven) (D)
		71 to 80 points	8 (eight) (C)
		81 to 90 points	9 (nine) (B)
		91 to 100 points	10 (ten) (A)
19.	Course completion and final exam requirements	Realized activities 15.1 and 15.2	
20.	Teaching Language	Macedonian and English	
21.	Teaching quality evaluation method	Internal evaluation mechanisms and questionnaires	

22. Course Material

22.1. Mandatory course material

No.	Author	Title	Publisher	Year
1	Richard Szeliski	Computer Vision: Algorithms and Applications	Microsoft Research	2010
2	D.A. Forsyth and J. Ponce	Computer Vision: A Modern Approach	Prentice Hall	2002
3	N. Sebe, M.S. Lew	Robust Computer Vision: Theory and Applications (Computational Imaging and Vision)	Springer	2003

22.2. Additional course material

No.	Author	Title	Publisher	Year