MODELLO D (inglese)	
General Information	
Academic subject	Computer Vision
Degree course	Computer Science (LM18)
Curriculum	Artificial Intelligence
ECTS credits	6
Compulsory attendance	No
Language	English

Subject teachers	Name Surname	Mail address	SSD
	Giovanna Castellano	giovanna.castellano@uniba.it	INF01
	Berardina Nadja De Carolis	berardina.decarolis@uniba.it	INF01

ECTS credits details			
Lectures	4 credits	32 hours	
Exercises	2 credit	30 hours	

Class schedule	
Period	2st semester
Year	1st
Type of class	Lectures - workshops

Time management	
Hours	62
Hours of lectures	32
Tutorials and lab	30

Academic calendar	
Class begins	March 1, 2021
Class ends	June 4, 2021

Syllabus	
Prerequisites/requirements	None.
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in A4a, A4b, A4c tables of the SUA-CdS)	*Knowledge and understanding* The students will know the foundations, the main tasks and the main approaches to Computer Vision, with particular focus on applications in the field of Social Robotics. *Applying knowledge and understanding* The students will be able to apply Computer Vision techniques to specific problems in different interdisciplinary areas and to properly set up the techniques for fruitful applications. *Making informed judgements and choices* The students will be able to compare different Computer Vision techniques, and to choose those that are appropriate to tackle specific problems. *Communicating knowledge and understanding* The students will be able to work in team, bringing to bear their knowledge in order to carry out fruitful cooperation with other kinds of expertise from other members of the team.

	Capacities to continue learning The students will be provided with methodological foundations that will allow them to understand the latest developments of Computer Vision and stay up-to-date with advances published in recent scientific papers and authoritative websites.
Contents	Course outline - From Image processing to Computer Vision Part I - Basics of Image processing • Light and Color, Image formation, Color models • Transformations, Filtering, Convolution • Contrast enhancement Part II - Grouping/segmentation of pixels • Edge detection and Thresholding • Clustering and fuzzy clustering for image segmentation Part III - Image classification and object recognition • Machine learning for CV • Image classification • Supervised learning (ANNs) for Computer Vision • Deep learning (CNNs) for Computer Vision • Fuzzy logic for CV Part IV - Computer Vision applications in Social Robotics
Course program	
Bibliography	R.C. Gonzalez and R.E. Woods. Digital Image Processing, Prentice Hall, 2002. S. Gollapudi, Learn Computer Vision Using OpenCV - With Deep Learning CNNs and RNNs, Apress, 2019. J.E. Solem, Programming Computer Vision with Python, O'Reilly. ebook
Notes	When necessary, the students will be provided with supplementary material given by the teachers.
Teaching methods	Lectures, exercises and tutorials in the classroom
Assessment methods (indicate at least the type written, oral, other)	Oral test, requiring previous submission (no later than a week before) of a case study.
Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are.	1. Ability to identify the appropriate Computer Vision method to approach a specific problem 2. Ability to apply a suitable Computer Vision method to solve a problem in a specific applicative scenario.
Further information	