General information	
Academic subject	Computational Intelligence
Degree course	Computer Science (LM-18)
Curriculum	Knowledge Engineering and Machine Intelligence
Credits	6
Compulsory attendance	No, but recommended
Language	English

Teachers	Name Surname	E-mail address
	Gennaro Vessio	gennaro.vessio@uniba.it
	Gabriella Casalino	gabriella.casalino@uniba.it

Credit details	Type	# credits	hours
	Lectures	4	32
	Laboratory	1	15
	Student project	1	

Schedule	
Period	1st semester
Year	2nd
Type of class	Lectures + tutorials + seminars

Time management	
Hours	47
Lectures	32
Laboratory	15

Calendar	
Class begins	September 28, 2020
Class ends	January 13, 2021

Syllabus	
Prerequisites	None. Students who attended the Artificial Intelligence course in the first year can have some advantages.

Expected learning outcomes (according to Dublin Descriptors)	*Knowledge and understanding* Students will know the basics, main tasks and main approaches to Computational Intelligence, with particular attention to Neural Networks. *Applying knowledge and understanding* Students will be able to apply Computational Intelligence techniques to specific problems in several interdisciplinary areas, to adequately set the techniques for a fruitful application and to set up evaluation experiments. *Making informed judgements and choices* Students will be able to compare different Computational Intelligence techniques and choose the appropriate ones to address specific problems. They will also be able to evaluate the experimental results and link them to the characteristics of the technique evaluated. *Communicating knowledge and understanding* Students will be able to work in teams, completing their knowledge of Computational Intelligence in order to realize a fruitful collaboration with other types of skills of other team members. *Capacities to continue learning* Students will be provided with methodological foundations that will enable them to understand the latest developments in Computational Intelligence. Classes will make use of recent scientific articles and authoritative websites that will allow students to stay up to date on advances in Computational Intelligence.
Content	• Preliminaries • Machine learning: A tour of the classics • Neural networks • Convolutional neural networks • Genetic algorithms • Fuzzy systems • Applications

Course program	
Bibliography	• Russel, S., & Norvig, P. (2013). Artificial intelligence: A modern approach. Pearson Education Limited

	• Engelbrecht, A. P. (2007). Computational intelligence: An introduction. John Wiley & Sons • James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). An introduction to statistical learning. New York: Springer • Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep learning. MIT press • Chollet, F. (2017). Deep Learning with Python. Manning Publications • Géron, A. (2019). Hands-on machine learning with Scikit-Learn, Keras, and TensorFlow: Concepts, tools, and techniques to build intelligent systems. O'Reilly Media
Notes	When needed, students will be provided with additional material, such as articles or online resources.
Teaching methods	Lectures, classroom programming tutorials and seminars.
Assessment methods	Oral exam on a previously submitted case study (no later than one week before).
Evaluation criteria	• Ability to identify the appropriate method to address a specific problem. • Ability to apply the method to try to solve the problem. • Ability to critically discuss the main strengths and limitations of the proposed approach. • Ability to write and clearly present the case study carried out.
Further information	It is highly recommended to feed your curiosity by independently exploring topics not explained directly in the course, as the panorama is very vast, full of ideas and constantly evolving.