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

Subject teacher	Name Surname	Mail address	SSD
	Corrado Mencar	corrado.mencar@uniba.it	INF/01
Place and reception time	Dept. of Computer Science, 6th floor	Monday, 15:00-17:00 or by appointment	

ECTS credits details		SSD	
Lectures	4 credits	INF/01	
Workshops	2 credits	INF/01	

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

Time management	
Hours	150
Hours of lectures	32
Tutorials and lab	30

Academic calendar	
Class begins	Sept. 24th, 2018
Class ends	Jan. 11th, 2019

Syllabus	
Prerequisites/requirements	Basic knowledge in Probability Theory Basic knowledge in Discrete Mathematics and Calculus Basic knowledge in Computer Science
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in the Didactic Regulation and Prospectus a.a. 2017-2018)	*Knowledge and understanding* The class in Information Theory provides the students with in-depth theoretical and methodological skills related to the concept of information (in the wide sense) and related theories. In particular, the class focuses on the general concepts of information theory, entropy, codes and stochastic processes. *Applying knowledge and understanding* The students in Information Theory will be able to use the acquired knowledge to: 1. understand and solve complex problems in different interdisciplinary areas; 2. integrate and individually find and re-adapt known solutions to growing problems (problem solving);

	Making informed judgements and choices The class gives the students the ability of modelling systems by considering the informational aspects of a system and the related measures. The exam requires the students to solve a problem by using the concepts of information theory. *Communicating knowledge and understanding* The students will refine their ability in communicating formal knowledge about a system in terms of informational concepts described in mathematical terms. In the exam, the students will be evaluated also according to their ability in formalizing the solutions of their assignments. *Capacities to continue learning* The class is general enough to enable students to continue their learning through more specialized scientific material (books, papers, etc.). The lectures will make use of internationally-recognized textbooks, scientific papers and authoritative websites.
Contents	• General Systems Theory • Probability Theory • Introduction to the Philosophy of Information • Shannon's Information Theory • Introduction to Coding Theory • Introduction to Algorithmic Information Theory • Introduction to Information Principle
Course program	
Bibliography	• Cover, T. M., & Thomas, J. A. (2006). Elements of information theory. New York: John Wiley & Sons. • Skyttner, L. (2005). General systems theory: Problems, perspectives, practice. Singapore: World Scientific. • MacKay, D. J. C. (2011). Information theory, inference, and learning algorithms. Cambridge [etc.: Cambridge University Press. • Ash, R. B. (1990). Information theory. New York: Dover Publications.
Notes	The teacher will provide the students with supplemental material
Teaching methods	Lectures, exercises in the classroom
Assessment methods (indicate at least the type written, oral, other)	written
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 of using a correct formalization 2. Ability of approaching a problem through the concepts of information theory 3. Ability of creating examples and scenarios using the required concepts of information theory
Further information	