COURSE DESCRIPTION – ACADEMIC YEAR 2018/2019

Course title	**Data Visualization and Exploration**
Course code	73001
Scientific sector	INF/01
Degree	Master in Computational Data Science (LM-18)
Semester	1
Year	1
Credits	6
Modular	No

Total lecturing hours	40
Total lab hours	20
Attendance	Attendance to lectures is not compulsory, but non-attending students have to contact the lecturer at the start of the semester to agree on the modalities of the independent study.
Prerequisites	
Course page	https://ole.unibz.it/

Specific educational objectives	The course belongs to the type "caratterizzanti – discipline informatiche" in the curriculum "Data Analytics". The course aims to provide students with theoretical knowledge and professional skills for: • understanding different types of visual representations and how the different types of visual attributes are perceived by human vision, • understanding how visual representation aids exploratory and confirmatory analysis • designing, applying and evaluating different visual representations in various professional contexts placing users and their needs at the centre of the process.

Lecturer	Cigdem Gencel
Contact	Office: Faculty of Computer Science, BZ P3.11 Email: cigdem.gencel@unibz.it Tel: +39 0471 016183
Scientific sector of lecturer	INF/01
Teaching language	English
Office hours	The office hours will be on Thursday between 11:00-12:00 at the Faculty of Computer Science, BZ P3.11
Lecturing Assistant (if any)	-
Contact LA	-
Office hours LA	-
List of topics	• Human psychology and perception • Data and image models • Visualization software and tools • Visual Diagnostics • Exploratory data analytics • Discovery methods

Teaching format	Frontal lectures, exercises, assignments and a term project

Learning outcomes	Knowledge and understanding: • D1.1 - Knowledge of the key concepts and technologies of data science disciplines • D1.2 - Understanding of the skills, tools and techniques required for an effective use of data science • D1.3 - Knowledge of principles, methods and techniques for processing data in order to make them usable for practical purposes, and understanding of the challenges in this field • D1.9 - Knowledge of the challenges in the field of man-machine interface and of the methods and techniques for overcoming these challenges Applying knowledge and understanding: • D2.1 - Practical application and evaluation of tools and techniques in the field of data science • D2.9 - Design, application and evaluation of technologies and tools for human-machine interaction, data exploration and data visualization Making judgments • D3.2 - Ability to autonomously select the documentation (in the form of books, web, magazines, etc.) needed to keep up to date in a given sector. Communication skills • D4.1 - Ability to use English at an advanced level with particular reference to disciplinary terminology • D4.2 - Ability to present one's work in a clear and comprehensible way in front of an audience, including non-specialists • D4.3 - Ability to structure and draft scientific and technical documentation

Assessment	Project work and oral exam: Project report and presentation done in groups and individual oral exam with verification questions. The exam modalities for non-attending students are the same as for the attending students. Students have to be present in the class or online during the project presentation and in the class during the oral exam. Projects have to be completed, presented and evaluated BEFORE the final exam, otherwise the exam cannot be registered.
Assessment language	English
Assessment Typology	Monocratic
Evaluation criteria and criteria for awarding marks	The assessment of the project work and oral exam is as follows: • Group project work (50% of the final mark): Ability to apply the acquired theoretical knowledge in practice by means of a project, work in a team, creativity, skills in critical thinking, ability to present the produced results

	• Individual oral exam (50% of the final mark): Mastery of topics discussed in the scope of the course, ability to integrate the newly acquired knowledge and reflect and discuss the results produced during the project work Both attending and non-attending students to the class are required to fulfil both types of activities in order to pass the course. For registering the exam, the project has to be completed, presented and evaluated.

Required readings	There is not 'a' text book for this course, but the following book is strongly suggested for reading: • Introduction to Information Visualization by Riccardo Mazza. 2009. Springer Verlag, ISBN: 978-1-84800-218-0.
Supplementary readings	Other supplementary readings include but not limited to : • Information Visualization: An Introduction by Robert Spence. 2014. ISBN 3-319-07341-9. • Using vision to think by Stuart K. Card, Jock D. MacKinlay, Ben Shneiderman. 1999. Morgan Kaufmann series in interactive technologies. • Information visualization: Perception for design by Colin Ware. 2000. Morgan Kaufmann series in interactive technologies
Software used	Visualisation software and tools available in the CS Labs