COURSE DESCRIPTION – ACADEMIC YEAR 2021/2022

Course title	**Research Methods and Technology Transfer**
Course code	73035
Scientific sector	INF/01
Degree	Master in Computational Data Science (LM-18)
Semester	1
Year	2
Credits	6
Modular	No

Total lecturing hours	40
Total lab hours	20
Attendance	Not compulsory
Prerequisites	Prior courses in Management Engineering and Mathematical Modeling.
Course page	https://ole.unibz.it/

Specific educational objectives	The course belongs to the type "caratterizzanti – discipline informatiche" in the curricula "Data Analytics" and "Data Management". This course is to present the research paradigms such as design science, behavior science or mathematical modeling across Engineering community, Information System community, and Computer Science community. It mainly focuses on the know-how in research, which includes empirical, mathematical, statistical and engineering methodologies. From the scientific perspective, this course will address how to explore the research challenges and how to conduct the research by using suitable research paradigms and methodologies.

Lecturer	Ilenia Fronza
Contact	Piazza Domenicani 3, Room 1.08, Ilenia.Fronza@unibz.it, +39 0471 016247
Scientific sector of lecturer	INF/01
Teaching language	English
Office hours	Arrange beforehand by email.
Lecturing Assistant (if any)	--
Contact LA	--
Office hours LA	--
List of topics	• Research paradigms in information and computer sciences and research methods • Quality assessment of research papers • Literature review • Dissemination techniques for research results • Research planning • Models and methods of technology transfer
Teaching format	Frontal lectures, hands-on activity, and discussion.

Learning outcomes	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 • D3.3 - Ability to identify reasonable work goals and estimate the resources needed to achieve these goals 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	Lab exercises and project work [70% of mark] + final exam (oral) [30% of mark]. The oral exam is needed to assess the students' understanding of the topic's key principles. The laboratory exercises are needed to assess the students' ability to work with examples, applications and real systems. The written project report is needed to assess ability to work in a team, creativity, identification of interesting research questions to investigate in the project, effectiveness in the results and lessons learned presentation. Lab exercises and the final exam are mandatory, and both must be positive in order to pass the exam. In case of a positive mark for the project, the mark will count for the remaining regular exam sessions of the academic year. In case of negative evaluation of the project, a new project needs to be submitted for the next session. Students can choose between two modalities to prepare the project work. • Step-by-step, which means completing successfully the lab exercises and project work. • All-in-one, which means preparing the project work and presenting it before the final exam. Projects and lab exercises have to be evaluated BEFORE the final exam, otherwise the exam cannot be registered.
Assessment language	English
Assessment Typology	Monocratic
Evaluation criteria and criteria for awarding marks	Relevant for the Theory assessment: correctness of answers, clarity of answers, ability to summarize, deep understanding of experimental designs, methodologies, and data analysis techniques. Relevant for the Practice assessment: creativity, individual contribution, skills in critical thinking, identification of interesting research questions, effectiveness in the results and lessons learned presentation.

Required readings	• Experimentation in Software Engineering. C. Wohlin, P. Runeson, M. Höst, M.C. Ohlsson, B.Regnell, A. Wesslén. Springer, 2012 • Software Metrics – A Rigorous & Practical Approach. N. Fenton, S. Pfleeger. Students will be exposed to current topics of research by reading papers provided during the lectures. Subject Librarian: David Gebhardi, David.Gebhardi@unibz.it
Supplementary readings	• Research articles provided during the course • Bhattacherjee A., Social Science Research: Principles, Methods, and Practices, 2012, Open Free Textbook [pdf] • Corbin, J. & Strauss, A. (2008). Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory. 3rd ed., Thousand Oaks: Sage UNIBZ library code: MR 2000 C791(3) • Gerring J., Case study Research: Principles and Practices 2007 [UNIBZ Library: MR 2000 G378] • Nardi P., Doing Survey Research: A Guide to Quantitative Methods, 2006 [UNIBZ Library, MR 2400 N223 (2.06)]
Software used	--