

## COURSE DESCRIPTION – ACADEMIC YEAR 2019/2020

<b>Course title</b>	<b>Research Methods</b>
<b>Course code</b>	76009
<b>Scientific sector</b>	M-FIL/02
<b>Degree</b>	European Master in Software Engineering (LM-18)
<b>Semester</b>	1
<b>Year</b>	2
<b>Credits</b>	2
<b>Modular</b>	No

<b>Total lecturing hours</b>	18
<b>Total lab hours</b>	--
<b>Total exercise hours</b>	--
<b>Attendance</b>	Not compulsory
<b>Prerequisites</b>	Prior courses in Management Engineering and Mathematical Modeling.
<b>Course page</b>	<a href="https://ole.unibz.it/">https://ole.unibz.it/</a>

<b>Specific educational objectives</b>	<p>The course belongs to the type "ulteriori attività formative – altre conoscenze utili per l'inserimento nel mondo del lavoro".</p> <p>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.</p>
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<b>Lecturer</b>	<a href="#">Ilenia Fronza</a>
<b>Contact</b>	Piazza Domenicani 3, Room 1.08, <a href="mailto:Ilenia.Fronza@unibz.it">Ilenia.Fronza@unibz.it</a> , +39 0471 016247
<b>Scientific sector of lecturer</b>	INF/01
<b>Teaching language</b>	English
<b>Office hours</b>	Arrange beforehand by email.
<b>Lecturing Assistant (if any)</b>	--
<b>Contact LA</b>	--
<b>Office hours LA</b>	--
<b>List of topics</b>	<ul style="list-style-type: none"> <li>• Research paradigms in science and computers</li> <li>• Empirical methods</li> <li>• Mathematical methods</li> <li>• Engineering research</li> </ul>
<b>Teaching format</b>	Frontal lectures, hands-on activity, and discussion.

<p><b>Learning outcomes</b></p>	<p>Knowledge and understanding</p> <ul style="list-style-type: none"> <li>• Thoroughly understand the scientific method of investigation.</li> <li>• Understand methods of mathematics and of statistics that support Information Technology and its applications.</li> </ul> <p>Applying knowledge and understanding:</p> <ul style="list-style-type: none"> <li>• Be able to identify new application requirements and business opportunities in the field of systems based on data and knowledge.</li> <li>• Be able to identify new needs and business opportunities in the field of software technology and services.</li> <li>• Be able to understand and write documentation for technical, scientific reporting.</li> </ul> <p>Making judgments</p> <ul style="list-style-type: none"> <li>• Be able to plan and re-plan a technical project activity aimed at building an information system and to bring it to completion by meeting the defined deadlines and objectives.</li> <li>• Be able to identify reasonable work goals and estimate the resources required to achieve the objectives.</li> </ul> <p>Communication skills</p> <ul style="list-style-type: none"> <li>• Be able to present in a fixed time the content of a scientific / technical report in front of an audience also composed of non-specialists.</li> <li>• Be able to structure and prepare scientific and technical documentation describing project activities.</li> </ul> <p>Learning skills</p> <ul style="list-style-type: none"> <li>• Be able, in the context of a problem-solving activity, to extend even incomplete knowledge taking into account the objective of the project.</li> </ul>
<p><b>Assessment</b></p>	<p>The assessment of the course consists of an individual research project report (100 % of the mark)</p>
<p><b>Assessment language</b></p>	<p>English</p>
<p><b>Assessment typology</b></p>	<p>Monocratic</p>
<p><b>Evaluation criteria and criteria for awarding marks</b></p>	<p>The project is mainly about letting the students choose a scientific topic related to their research interest or Master thesis or future PhD research. Based on the selected topic, they will set up a research plan. This research plan includes the knowledge they have learned in this course such as how to choose a/some suitable and rigorous research methods regarding certain research topic. Thus, they are able to apply and further understand the knowledge they have learned in this course.</p> <p>Each student will complete one project individually. They need to identify the research goals and plan the activities for their project. In this way, the ability of making judgments will be assessed. In the meantime, the students need to further learn the details of the research methods and discuss them in the class. That requires the ability of self-learning.</p>

<b>Required readings</b>	<ul style="list-style-type: none"> <li>C. Wohlin, P. Runeson, M. H��st, M. C. Ohlsson, B. Regnell and A. Wessl��n, Experimentation in Software Engineering, Springer, ISBN 978-3-642-29043-5, 2012</li> </ul>
<b>Supplementary readings</b>	<ul style="list-style-type: none"> <li>Research articles provided during the course</li> <li>Bhattacharjee A., Social Science Research: Principles, Methods, and Practices, 2012, Open Free Textbook <a href="#">[pdf]</a></li> <li>Corbin, J. &amp; 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)</li> <li>Gerring J., Case study Research: Principles and Practices 2007 [UNIBZ Library: MR 2000 G378]</li> <li>Nardi P., Doing Survey Research: A Guide to Quantitative Methods, 2006 [UNIBZ Library, MR 2400 N223 (2.06)]</li> </ul>
<b>Software used</b>	Latex