

## COURSE DESCRIPTION – ACADEMIC YEAR 2021/2022

<b>Course title</b>	<b>RESEARCH METHODS PHD</b>
<b>Course code</b>	<b>71047</b>
<b>Scientific sector</b>	
<b>Degree</b>	Ph.D. in Computer Science
<b>Semester</b>	first
<b>Year</b>	2021/2022
<b>Credits</b>	6
<b>Modular</b>	No
<b>Total lecturing hours</b>	36
<b>Attendance</b>	mandatory
<b>Prerequisites</b>	There are no specific prerequisites for this course.
<b>Specific educational objectives</b>	<p>The course belongs to the type “area affine integrativa”.</p> <p>It is compulsory for all students enrolled in the PhD program in Computer Science, to fulfill the credit requirements for the 1<sup>st</sup> year of the PhD.</p> <p>The course provides an introduction to the most important research approaches and to the main research-related activities that PhD students will have to carry out during their PhD, and also if they later pursue a career as researchers in academia or industry.</p> <p>The main objective is to teach PhD students some basic skills they will need when autonomously conducting research. The course covers general aspects that are relevant to research in any scientific discipline, but specifically focuses on Computer Science when illustrating the main notions and for the exercises and projects assigned to the students.</p>
<b>Lecturers</b>	Diego Calvanese, Matteo Ceccarello, Antonella De Angeli, Enrico Franconi, Marco Montali, Werner Nutt
<b>Contact</b>	<a href="#">Piazza Domenicani 3</a> , Room 2.07, <a href="mailto:calvanese@inf.unibz.it">calvanese@inf.unibz.it</a> , 0471-016160
<b>Scientific sector of lecturer</b>	ING-INF/05 and INF-01
<b>Teaching language</b>	English
<b>List of topics</b>	<ul style="list-style-type: none"> <li>• Introduction to research and scientific paper reading and writing</li> <li>• Research evaluation</li> <li>• Presenting scientific work</li> <li>• Good scientific writing style</li> <li>• Empirical/experimental CS research methods</li> <li>• How to write a research plan</li> </ul>
<b>Teaching format</b>	The course consists of 6 units, each with frontal lectures, assignment and subsequent solution of exercises and/or assignment of a small project and subsequent discussion of the proposed solution.
<b>Learning outcomes</b>	<p>Knowledge and understanding:</p> <ul style="list-style-type: none"> <li>• Understand the research methods in scientific disciplines.</li> <li>• Understand the research methods in computer science.</li> </ul> <p>Applying knowledge and understanding:</p>

	<ul style="list-style-type: none"> <li>• Be able to conduct autonomous research in a scientific discipline.</li> <li>• Be able to read and understand scientific literature.</li> <li>• Be able to write a scientific article.</li> <li>• Be able to write a research plan.</li> </ul> <p>Making judgments</p> <ul style="list-style-type: none"> <li>• Be able to identify reasonable research goals and estimate the resources required to achieve the research objectives.</li> <li>• Be able to evaluate the research carried out by peers.</li> </ul> <p>Communication skills</p> <ul style="list-style-type: none"> <li>• Be able to present in a fixed time the own research to a specialized audience.</li> <li>• Be able to present in a fixed time the own research to a general audience also composed of non-specialists.</li> </ul> <p>Learning skills</p> <ul style="list-style-type: none"> <li>• Be able to autonomously extend the own knowledge by reading and understanding scientific articles.</li> <li>• Be able to extend the state-of-the-art in a scientific discipline by identifying open problems and proposing innovative solutions to solve them.</li> </ul>
<b>Assessment</b>	<p>Each unit assesses the fulfillment of the requirements through an assignment that the students carry out between the first and the second lecture for the unit, which are typically held at the beginning and end of a week, respectively.</p> <p>The assignment is evaluated and discussed during the second lecture of each unit. Typical forms of assignment are:</p> <ul style="list-style-type: none"> <li>• correction or improvement of a scientific article;</li> <li>• evaluation/review of scientific articles;</li> <li>• preparation of a presentation about scientific work;</li> <li>• writing of (a portion of) a research plan.</li> </ul>
<b>Assessment language</b>	English
<b>Evaluation criteria and criteria for awarding marks</b>	<p>The exam is pass/fail and no marks are awarded.</p> <p>Relevant for the assessment are the following: clarity of exposition, ability to summarize, evaluate, and establish relationships between topics, ability to present scientific notions, ability to evaluate research results by others.</p>
<b>Required readings</b>	The reading material is specified during the course. It consists of the slides prepared by the various lecturers of the six units and presented during the course, and of additional material that the lecturers list on the on the slides.
<b>Supplementary readings</b>	Additional reading material is made available on the course Web Page <a href="http://www.inf.unibz.it/~calvanese/teaching/PhD-RM/">http://www.inf.unibz.it/~calvanese/teaching/PhD-RM/</a>
<b>Software used</b>	The EasyChair online system is used for the unit on "Research Evaluation".