Syllabus

Course Description

Course Title	Research Methods
Course Code	76107
Course Title Additional	
Scientific-Disciplinary Sector	IINF-05/A
Language	English
Degree Course	Master in Software Engineering
Other Degree Courses (Loaned)	
Lecturers	Prof. Ilenia Fronza, Ilenia.Fronza@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/17458
Teaching Assistant	
Semester	First semester
Course Year/s	2
CP	6
Teaching Hours	40
Lab Hours	20
Individual Study Hours	90
Planned Office Hours	18
Contents Summary	• Quantitative, qualitative, and mixed-methods • Literature review • Questionnaires and Interviews • Experiments • Case study • Reporting research results
Course Topics	The course addresses key challenges in scientific research and equips students with effective methods for conducting and reporting research.
Keywords	Research methods, Reporting research

Recommended Prerequisites	
Propaedeutic Courses	
Teaching Format	Frontal lectures, hands-on activity, and discussion.
Mandatory Attendance	Attendance is not compulsory. However, students must attend at least 75% of the lab hours to qualify as "attending students.
Specific Educational Objectives and Learning Outcomes	Knowledge and understanding D1.2 be able to analyse and solve even complex problems in the area of Software Engineering for Information Systems with particular emphasis on the use of empirical evaluation studies, methods, techniques and technologies D1.7 know the various fields of application of Software Engineering also with reference to the local, national and international economic-social context D1.8 ability to read and understand specialist scientific documentation, such as conference proceedings, articles in scientific journals, technical manuals Applying knowledge and understanding D2.2 know how to design and carry out experimental analyses of software systems in order to acquire measurements of their behaviour and evaluate experimental hypotheses in different application fields, such as business, industry or research Making judgements D3.1 ability to independently select documentation from various sources, including technical books, digital libraries, technical scientific journals, web portals or open source software and hardware tools D3.5 ability to work with broad autonomy, taking responsibility for projects and structures. Communication skills D4.1 ability to present the contents of a scientific/technical report in a set time in front of diverse audiences, including non-specialists. Learning skills D5.1 ability to independently extend the knowledge acquired during the course of study by reading and understanding scientific

	and technical documentation in English
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	Attending students Project work [70% of mark] + final exam (oral) [30% of mark]. Project work is needed to assess the intended Learning Outcomes (ILOs) D1.2, D1.8, D2.2, D3.1, and D3.5. The oral exam is needed to assess ILOs D1.7, D1.8, D2.2, D4.1, and D5.1. Project work and final exam are mandatory, and both must be positive to pass the exam. In case of a positive mark for the project work, the mark will count for the remaining regular exam sessions. In case of negative evaluation of the project work, a new project needs to be submitted for the next session. Project work must be evaluated BEFORE the final exam, otherwise the exam cannot be registered. Students must attend at least 75% of the lab hours to qualify as "attending students". Non-attending students Final exam (oral) [100% of mark]. Verification questions and discussion about the topics of the course. ILOs assessed: all.
Evaluation Criteria	Relevant for the final exam assessment: correctness of answers, clarity of answers, ability to summarize, and deep understanding of the course topics. Relevant for the project work assessment: skills in critical thinking, identification of interesting research questions, correct application of the research methods, effectiveness in the results, and quality of the final report.
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. • Creswell, J. W. (2014). Research design: Qualitative, quantitative, and mixed methods approaches. Sage.

	• · Richards, L. (2014). Handling qualitative data: A practical guide. Sage. • Easterbrook S., Singer J., Storey MA., Damian D. (2008) Selecting Empirical Methods for Software Engineering Research. In: Shull F., Singer J., Sjøberg D.I.K. (eds) Guide to Advanced Empirical Software Engineering. Springer, London. https://doi.org/10.1007/978-1-84800-044-5_11 • Fowler, F. J. (2009). Applied Social Research Methods: Survey research methods (4th ed.). Thousand Oaks, CA: SAGE Publications, Inc. doi: 10.4135/9781452230184 • Runeson, P., Host, M., Rainer, A., & Regnell, B. (2012). Case study research in software engineering: Guidelines and examples. John Wiley&Sons. https://onlinelibrary.wiley.com/doi/book/10.1002/9781118181 • Additional books and papers will be provided during the course.
Supplementary Readings	
Further Information	
Sustainable Development Goals (SDGs)	Gender equality, Quality education