Syllabus

Course Description

Course Title	Environmental data analysis
Course Code	47068
Course Title Additional	
Scientific-Disciplinary Sector	NN
Language	English
Degree Course	Master in Environmental Management of Mountain Areas
Other Degree Courses (Loaned)	
Lecturers	Dr. PhD. Federico Ferraccioli, Federico.Ferraccioli@unibz.it https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/49979
Teaching Assistant	
Semester	First semester
Course Year/s	1
CP	3
Teaching Hours	20
Lab Hours	10
Individual Study Hours	45
Planned Office Hours	9
Contents Summary	- Ability to manage, analyse and interpret data and to present them graphically - Learn specialised statistical software and functions to perform data analysis - Ability to apply theoretical and empirical models to a real-world context - Ability to interpret the results of environmental analysis and draw appropriate conclusions
Course Topics	Research questions and experimental design in environmental science

	Reproducible scientific programming in R Environmental data collection, organisation and quality control Data ownership, FAIR principles and responsible data sharing Analysis of meteorological, microclimate, phenocam and dendrometer data Visualisation, interpretation and presentation of scientific results
Keywords	Environmental data analysis; experimental design; scientific programming; reproducibility; environmental monitoring; data visualisation; uncertainty; FAIR data; open science; scientific communication.
Recommended Prerequisites	Basic knowledge of environmental science and introductory statistics is recommended. Previous experience with R or another programming language is helpful but not required.
Propaedeutic Courses	No
Teaching Format	Interactive lectures combined with guided computer practicals in R, case-based discussions and problem-oriented analysis of environmental datasets. Students work in small groups to formulate research questions, analyse data, and communicate their findings.
Mandatory Attendance	No
Specific Educational Objectives and Learning Outcomes	Ability to apply knowledge and understanding --> Knowledge and learning abilities are achieved through course attendance, practical activities both in the field and in the laboratory and through personal study. The achievement of the learning objectives will be tested through oral and/or written examinations, as well as through the guided preparation of seminars on topics specific to the Master's degree. The tests (written and oral examinations, reports) and exercises involve the performance of specific tasks in which the student demonstrates mastery of tools, methodologies and critical autonomy. Learning capacity --> The graduate will have the ability to learn by synthesising the notions learnt in the course of studies, in order to address complex design issues, by expanding and updating the knowledge and technical skills acquired by using analysis, design and management tools appropriate to the situations in which the graduate operates.

	The graduate will be able to manage the different information networks in order to be able to continue to learn and thus to update himself/herself for his/her own cultural improvement and professional advancement. In addition, the graduate will be able to identify the appropriate training tools and paths for the development of their own cultural and specialist knowledge. Learning skills are attained during all phases of the course of study. The Master's degree course enables students to consolidate their self-study skills, especially when they carry out group work on proposed topics; again, this ability is enhanced during a compulsory course, which involves group work, and subsequently in the preparation of the final thesis of an experimental nature. In particular, this practical course requires students to work in small groups (3-5) on a project (e.g., rural development plan for a mountainous area, rehabilitation project for a degraded terrestrial or river ecosystem) from its initial stages (identification of objectives, conceptual development of actions, collection of available data) through to interaction with the various stakeholders and communication activities towards society. The projects will take place under the supervision of two or more professors from the two universities involved, but also by having the students interact with professional firms and/or public technical offices that have already expressed interest and willingness to do so. Learning ability is assessed through continuous forms of verification during the training activities and during the conduct of the activity related to the final examination.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	Written/oral exam and/or project work.
Evaluation Criteria	Assessment will focus on the ability to apply methods, critical thinking, and clarity of technical communication.
Required Readings	Provided via Open Learning Environment or MS Teams.
Supplementary Readings	Provided via Open Learning Environment or MS Teams.
Further Information	
Sustainable Development	Quality education, Life on land, Climate action, Industry, innovation

Goals (SDGs)	and infrastructure