

Syllabus

Course description

Course title	Advanced Statistics
Course code	46001
Scientific sector	SECS/S-02
Degree	PhD in Mountain Environment and Agriculture (MEA) PhD in Sustainable Energy and Technologies (SET)
Semester	1°
Year	1°
Academic year	2022-2023
Credits	3
Modular	NO
Total lecturing hours	30
Total lab hours	
Total exercise hours	0
Attendance	Yes
Prerequisites	
Course page	
Specific educational objectives	The course delves into basic concepts in descriptive and inferential statistics. It is designed for acquiring knowledge and professional skills. The students will be enabled to independent treatment of statistical research issues. The use of the software R is foreseen.
Lecturer	Prof. Maria Letizia Bertotti, Building K, Room 2.12, e-mail: MariaLetizia.Bertotti@unibz.it , tel. 0471 017130, http://www.unibz.it/en/sciencetechnology/people/StaffDetails.html?personid=26965&hstf=26965
Scientific sector of the lecturer	MAT/07
Teaching language	English
Office hours	by appointment
Teaching assistant (if any)	
Office hours	
List of topics covered	Motivation and a Review of Key Concepts of Statistics Descriptive Statistics Elements of Probability Random Variables Discrete Probability Distributions Continuous Probability Distributions Parameters of a distribution Special Random Variables

	(Binomial RV and distribution, Poisson RV and distribution, Uniform RV and distribution, Normal RV and distribution, Exponential RV and distribution, ...) Distributions of Sampling Statistics Parameter Estimation Hypothesis Testing Regression Analysis of Variance Use of the software R
Teaching format	Frontal lectures.

Learning outcomes	<p>Knowledge and understanding Knowledge and understanding of concepts and methods of statistics for data analysis.</p> <p>Applying knowledge and understanding Ability to understand the role of statistics in applications and to identify appropriate statistical methods for data analysis. Use of the software R.</p> <p>Making judgements Ability to choose a right approach and convenient tools towards tackling problems and questions.</p> <p>Communication skills Ability to clearly and correctly describe the suitable approach to a given question and/or the results of a statistical analysis.</p> <p>Learning skills Ability to autonomously extend and adapt the acquisition and assimilation of the symbolism, methods and tools of this course.</p>
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Assessment	Collaboration in exercises. Presentation of a specific topic.
Assessment language	English
Evaluation criteria and criteria for awarding marks	

Required readings	Ross, Sheldon M., Introduction to probability and statistics for engineers and scientists, 6th ed., Amsterdam et al., Elsevier Academic Press
Supplementary readings	
Software used	R (see "The R Project for Statistical Computing" at https://www.r-project.org)