University of Catania – Department of Agricultural, Food and Environment
Academic Year 2025/2026 – XLI Cycle - Educational Project – PhD Course on Agricultural, Food and Environmental Science

Title and duration	Teacher	Dates	Aim of the course	Content of the course	Type of exam
1. Applied statistics for experimental applications					
Applied statistics for experimental applications 9 hrs	Daniela Ferrarello, Di3A, UniCT	15 June (11.00-14.00), 16 June (9.00-12.00) 18 June (11.00-14.00) Classroom: H	The aim of the course is to introduce statistical methods for analyzing experimental data. It covers both univariate and multivariate analysis, equipping participants with essential mathematical tools for data interpretation. Practical examples and exercises will help Ph.D. students to apply statistical techniques effectively in experimental research.	Introduction to descriptive statistics and univariate analysis of experimental data: - Data types: qualitative and quantitative data - Data visualization: diagrams - Measures of central tendency: mean, median - Measures of dispersion: range, variance and standard deviation Bivariate analysis of experimental data: - Introduction to bivariate data analysis: relationship between two variables - Data visualization: scatter plots - Covariance - Correlation coefficient (Pearson's *r*) Multivariate analysis of experimental data: - Introduction to multivariate data analysis - Matrices and determinants - Eigenvalues and eigenvectors - Introduction to Principal Component Analysis (PCA) - Dimensionality reduction to simplify complex datasets	Written
2. Managing biological data with R: applications for plants and fruit tree species					
Managing biological data with R: applications for plants and fruit tree species 21 hrs	Mario di Guardo and Luca Paul Leonardo Di3A, UniCT	22 June (9:00-13:00), 23 June (9:00-13:00), 24 June (9:00-13:00), 25 June (9:00-13:00), 26 June (9:00-14:00) Classroom: D	The course is aimed at the utilization of the R software, one of the most employed software for data and statistical analysis. The course is structured in 20 hours of theoretical-practical activities covering the most widely used functions for the analysis and interpretation of biological data. A prior knowledge of the R software is not required	- Introduction to R environment - Introduction to R Studio environment - Set the working directory - Import a dataset - Element extraction from vectors and matrix - Matrix and dataframe subsetting - Summary functions (*table, str, dim, nrow, ncol*) - Save a dataframe or a matrix - Graphical functions (*plot, barplot, hist, boxplot, qqplot*) - Text functions (*nchar, substr, gsub*) - Mathematical functions (*sum, mean, sd, max, min*) - Apply functions while grouping by factors (*aggregate*) - Logical functions (*ifelse*, and, or, equal to, different from) - Apply iterative functions to vector (*sapply*) - Apply iterative functions to data.frame (*apply*) - Merge two objects (*merge*) - Apply iterative functions to vector (*sapply*)	Practical

				- Apply iterative functions to data.frame (*apply*) - Merge two objects (*merge*) - Statistical functions (*cor.test, shapiro.test, t.test, aov*)	
3. Introduction to a literature review process: overview and guidelines					
Introduction to a literature review process: overview and guidelines 6hrs	Daniela Spina, Di3A, UniCT	7 July 8 July (9:00-12:00) Classroom: D	This introductory course, designed for doctoral students who are in the early stages of their doctoral trajectory, provides guidance for the complete literature review process	- Literature Search and Selection - Evaluation of sources (Managing Data) - Identification of themes and gaps - Outline the structure - Results Presentation - Scientific Mapping	Practical and Oral
4. Scientific publishing in the peer review era					
Scientific publishing in the peer review era 6hrs	Michele Ricupero, Di3A, UniCT	20 May Classroom: P 21 May (15:00-18:00) Classroom: K	Students will develop skills in writing and preparing scientific papers for publication in targeted academic journal, learn how to navigate the editorial process with publishers, understand post-submission and acceptance procedures, and explore strategies to promote their research to both academic and non-academic communities.	I. Foundational principles - Understanding the scientific publishing landscape - Impact factors and other metrics - Ethical consideration II. Writing skills - Writing different types of scientific papers - Data presentation and visualization III. Publishing skills - Navigating the publication process - Working with publishers and editors IV. Post-publication and dissemination - Promoting your research - Post-publication activities	Written
5. Advanced tools for GIS applications for land representation					
Advanced tools for GIS applications for land representation 6hrs	Claudia Arcidiacono, Di3A, UniCT	4 June Classroom: J 5 June Classroom: H (11:00-14:00)	The course "Advanced tools for GIS applications for land representation" aims at applying Geographic Information Systems (GIS) and spatial data to document and illustrate local and global issues related to agriculture. GIS principles and advanced tools will be carried out using the open-source programme QuantumGIS to create thematic maps from freely-available online spatial data. During the course, exercises will focus on the application of these tools for analysing environmental impacts from agriculture and livestock sectors.	- Basics and case studies on advanced tools for - Data acquisition and processing - Evaluation test	Practical
6. Get AI ready in research @University - Workshop					
Get AI ready in research @University 6hrs	Alessandro Suizzo APLS, UKE tutor and contract professor	2 July 9 July 15:00-18:00 Classroom: D	The workshop "Get AI ready in research @University" equips academic researchers with the practical skills needed to integrate AI tools effectively and critically into their research workflow. Participants will develop a confident, methodologically sound approach to AI-assisted research, grounded in awareness of its limitations, ethical implications, and disciplinary	The workshop covers AI tool typologies for academic research, hallucination risks and critical evaluation strategies, prompt engineering techniques, and editorial ethics including intellectual property and copyright. Practical activities will introduce tools such as Elicit, Semantic Scholar, ResearchRabbit, NotebookLM, Writefull, and Zotero.	Written (Online test with multiple choice questions)

			relevance.		
7. Interpersonal Communication - Workshop					
Interpersonal Communication 8hrs in 5 online meetings	Liliana Szczuka-Dorna and Katarzyna Matuszak Poznan University of Technology, RE-EuNICE alliance member	-25 May 17.00-18.30 or 26 May 9.00-10.30 -28 May 11.00-12.30 or 29 May 9.00-10.30 -15 June 9.00-10.30 or 16 June 12:00-13:30 -17 June 9.00-10.30 -18 June 9.00-10.30 or 19 June 10.00-11.30	- Providing students with basic knowledge in the field of Interpersonal Communication. - Improving students' listening and public speaking skills. - Acquainting students with nonverbal communication and body language - Developing intercultural communication skills. - Bringing the competence of written communication.	- The Process of Communication; Introduction to Communication; The Objectives of Communication; Barriers of Communication. - The Skill of Listening; The Importance of Listening Well; Improving Speaking Skills. - Nonverbal Communication; Body Language and Kinesics; The Language of Silence; The Language of Time; Space and Status, The Meaning of Nonverbal Communication. - Preparing for Public Speaking; Delivering Effective Presentations. - Intercultural Communication. - Communication in Written English	Practical and Oral
8. Joint workshop of the Agriculture-oriented PhD programs at Unict, Unifg and Uniud					
32hrs per workshop	Organized mainly by University of Udine (late September 2025), University of Catania (June 2026), University of Foggia (September 2027)	Several key note speakers will give inter, trans and multi-disciplinary talks	- 1st year students will present a poster and a 3-minute talk - 2nd and 3rd year students will present a 15 talk - The active participation to at least two Joint Workshops, within the three years, is mandatory for all students		Written

9. Seminars/workshops at UNICT					
Eight seminars of at least 2 hrs each	Seminars organized by various institutions of the University of Catania (e.g., PhD Days), including Di3A	To be attended within the 1st and 2nd years	- Students will have to attend at least eight seminars and provide a brief description (150/200 words) of the seminar content within the first- and second-year annual report		Written
10. Workshops and Classes organized by non-Di3A institutions					
At least a total of 10hrs	Workshops (e.g., Summer schools) and/or Classes (e.g. Linguistic courses) organized by non-Di3A institutions	To be attended within the 1st and 2nd years	- Students will have to attend at least 10hrs of courses and/or classes and provide a brief description (150/200 words) of their content within the first- and second-year annual report		Written