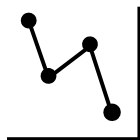
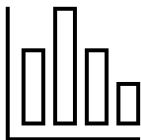




5th Course on Statistical Methodology for Agricultural Sciences «Dario Sacco»

Italian Society of Agronomy

LINEAR AND GENERALIZED LINEAR MODELS



3 - 7 February 2025

Università di Pisa

Dipartimento di Scienze Agrarie, Alimentari e Agro-ambientali

Aula di Entomologia | via del Borghetto 80, Pisa



5th Course on Statistical Methodology for Agricultural Sciences «Dario Sacco» 3 - 7 February 2025

Location and Schedule

The course will be held at the Dipartimento di Scienze Agrarie, Alimentari e Agro-ambientali of the Università di Pisa from February 3 to 7, 2025 (Aula di Entomologia, via del Borghetto 80, Pisa). The course will include both practical and theoretical lessons every day from 9:00 AM to 1:00 PM and from 3:00 PM to 6:30 PM.

Program

The course includes both theoretical and practical components, with various applications in the agronomic sector. The software used will be R, available at <https://cran.r-project.org/> for all operating systems. Participants are expected to have R installed on their computers, along with the packages that will be specified after registration. As prerequisites, participants should have basic knowledge of R and statistics (fundamental elements of descriptive and inferential statistics).

Credits for Doctoral Schools

Participation in the course may qualify for credits awarded by Doctoral Schools, if foreseen by the participant's institution, subject to learning verification.



The course is organized by the Italian Society of Agronomy (SIA).

The total cost of the course is **€300**, which includes the membership fee for SIA for the year 2025.

The course will be delivered in English, or in Italian if no international students will participate.

The course will be activated if the minimum number of 15 participants is reached and is open to a **maximum of 25**, with no more than 3 participants per institution. Admission to the course will, in any case, be subject to evaluation by the Board of the Italian Society of Agronomy.

Priority will be given to SIA members who are regularly enrolled for 2024 and to PhD students. At the end of the course, an official certificate will be issued, conditional on passing a learning assessment.

Those interested in participating are invited to submit their application by filling out the form available at the link by **12/12/2024**:

<https://forms.office.com/e/Bqe6agC177>

Only selected candidates will be notified of acceptance by 20/12/2024, at which point the registration form and payment details for the course fee—required for admission—will be sent.

Scientific Committee

Prof. Marco Acutis

Prof. Andrea Onofri

Prof. Alessia Perego

Dr. Antonio Pulina

Prof. Anna Maria Stellacci

Organizing Secretariat

Prof. Alessia Perego

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General Program

Slot

09:00-10:45

11:00-13:00

15:00-16:30

16:45-18:30

Day 1 – February 3, 2025

Brief introduction to descriptive and inferential statistics.

Introduction to the linear model.

Simple linear regression. Simple linear regression with R.

Group work with practical application of R.

Day 2 – February 4, 2025

One-way ANOVA. Basic assumptions for ANOVA. Power analysis.

Two-way ANOVA with interaction.

Multiple comparison tests. Experimental designs.

Practical application: case studies on the use of ANOVA and multiple comparisons with R.

Group work with practical application of R.

Day 3 – February 5, 2025

Practical application: case studies with R.

Correlation between observations and residuals. Repeated measures data analysis, definitions, and basic elements. Main approaches for analyzing data from experiments with repeated measures over time.

Introduction to mixed models and generalized least squares (LMMs and GLS) with R. 'Treatment factors' and 'grouping factors'. Mixed models with R: 'lme()' and 'gls()' functions.

Practical application: modeling and selection of the variance-covariance matrix of residuals for the analysis of repeated measures experiment data with R.

Day 4 – February 6, 2025

Practical application: case studies with R.

ANCOVA: models with categorical and continuous variables. Regression with random effects.

Group work with practical application of R.

Day 5 – February 7, 2025

Group work with practical application of R.