Course for Ph.D. students
XLII Cycle (1 Nov 2026 – 31 Oct 2029)

Curriculum
INNOVAZIONE NEL CAMPO DELLE SCIENZE FARMACEUTICHE

Multivariate Analysis with R
(2 ECTS)

Prof. Laura Scalvini
University of Parma

Course language: **English**
Scheduling: 01-02/02/2027; two lessons of 6 hours each (9:30-12:30/14:30-17:30). Informatics lab. CAD-CAM (Sede Scientifica di Ingegneria)
The course is limited to 20 students

To attend the course please contact:
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Course Content and Teaching Methods
The course provides foundational and applied concepts in chemometrics for medicinal chemistry and pharmaceutical analysis. Topics include multivariate exploratory and predictive methods, with specific focus on PCA and PLS techniques. Training is delivered through lectures and hands-on computer laboratory sessions (12 hours over two days), during which students gain practical experience in data analysis using R. Teaching materials, including slides and tutorials, are provided by the instructor, while supplementary manuals and online documentation support independent study.

Learning Outcomes
Upon completion of the course, PhD candidates will be able to:

- **Demonstrate knowledge and understanding** of principal chemometric methods used in medicinal chemistry and pharmaceutical analysis, including PCA and PLS.
- **Apply knowledge** of multivariate statistical techniques in R for the analysis and interpretation of complex experimental datasets.
- **Critically evaluate** chemometric results and select appropriate analytical approaches for pharmaceutical research problems.
- **Communicate data** analysis procedures and outcomes effectively in a scientific context.
- **Develop autonomous learning skills** enabling independent use of R-based tools and scientific resources for further methodological development.

Prerequisites
Participants are expected to possess prior knowledge of basic statistics.
Evaluation: YES (At the end of the course the students have to complete exercises similar to the case studies examined during the lessons).