



Course unit English denomination	Chemometrics: Experimental Design
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Teacher in charge (if defined)	Prof. Riccardo Leardi
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Teaching Hours	30
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Number of ECTS credits allocated	5
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Course period	27/01/2025 - 30/01/2025
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Course delivery method	<input checked="" type="checkbox"/> In presence <input type="checkbox"/> Remotely <input type="checkbox"/> Blended
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Language of instruction	English
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Mandatory attendance	<input checked="" type="checkbox"/> Yes (75% minimum of presence) <input type="checkbox"/> No
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Course unit contents	In this course, the main concepts and applications of experimental design are explained. Nowadays, experimental design is not as known and applied as it should be, and in most scientific papers, the "optimization" of a procedure is performed one variable at a time. The goal of this course is to show the real advantages in terms of reduced experimental effort and increased quality of information that can be obtained if this approach is followed. Rather than on the mathematical aspects, this course is focused on the mental attitude required by experimental design.
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Learning goals	By the end of the course, students will have acquired a thorough understanding of the fundamental principles of experimental design, including key theories and practices relevant to scientific research. They will develop practical skills in optimizing complex procedures, enhancing experimental efficiency and data quality, while minimizing resource expenditure. Furthermore, they will be able to apply these skills to solve research-related challenges, adopting a strategic, critical approach to planning experiments. This will enable them to confidently tackle complex, multidisciplinary tasks and contribute to innovative solutions in their fields, demonstrating the ability to integrate knowledge with external and social resources for problem-solving.
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Teaching methods	Teaching methods will include a combination of traditional lectures, aimed at providing direct instruction, and interactive sessions designed to engage students in active learning. These methods will be supplemented by: <ul style="list-style-type: none">• Group work in class to encourage collaboration and peer support.• Case studies and simulations to apply theoretical concepts to real-world scenarios.• Interactive teaching techniques that promote active participation.
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- Critical incident analysis to engage students in problem-solving.
 - Constructive feedback practices to support continuous improvement.

This integrative approach is designed to promote a reflective, interactive learning experience while encouraging the development of both individual and collaborative skills.

Course on transversal, interdisciplinary, transdisciplinary skills

- Yes
 No

Available for PhD students from other courses

- Yes
 No

The course is open to everyone, with priority given to PhD students from the PhD Course in Geosciences. External PhD students who wish to enroll should send an email to dottorato.geoscienze@unipd.it and will be contacted if spots become available.

Prerequisites (not mandatory)

max 3750 caratteri

Examination methods (in applicable)

PhD students are required to present an experimental design to the class.

Suggested readings

Slides prepared by the teacher plus specific material on the topic.

Additional information

max 3750 caratteri
