

Syllabus

Course description

Course title	Chemometric approaches to study the chemical and sensory markers of food processing
Course code	46027
Scientific sector	AGR/15 Food Science and Technology
Degree	Master Degree in Food Sciences for Innovation and Authenticity
Semester	1
Year	II
Academic year	2021/2022
Credits	3
Modular	NO
Total lecturing hours	20
Total lab hours	0
Total exercise hours	10
Attendance	
Prerequisites	Basic knowledge of food chemistry and statistical analysis.
Course page	Dedicate page on OLE for A.A. 2021-2022, I semester The material used in the Course will be provided to the students on OLE.
Specific educational objectives	A) provide an adequate knowledge and a critical approach to the identification of chemical and sensory markers of food processing, packaging and authenticity. B) provide adequate knowledge of the most common multivariate statistical approaches used to study the influence of processing conditions on the composition of food products, with practical examples.
Lecturer	Edoardo Longo, office at NOITechpark A2.3.03b, mail: edoardo.longo@unibz.it, phone: +39 0471017691, https://www.unibz.it/it/faculties/sciencetechnology/academic-staff/person/35783-edoardo-longo
Scientific sector of the lecturer	AGR/15 Food Science and Technology
Teaching language	English
Office hours	Scheduled as indicated the course timetable. Full availability to any request for more clarifications is granted upon previous arranged appointment.
Teaching assistant (if any)	None
Office hours	9
List of topics covered	Theoretical part Part A) Introduction to and application of exploratory

	<p>multivariate analysis models (e.g. PCA, HCA) in food quality data, introduction to more advanced exploratory models; Part B) Supervised multivariate classification models (eg. SIMCA; DA); Part C) Multivariate regression models (MLR, PCR, PLS) and derived classification methods (PLS-DA).</p> <p><i>Practical activities</i> Training and use of software tools for multivariate statistical analysis, for applications to dataset from food analytical and sensory analysis.</p>
Teaching format	Frontal lectures, exercises, projects
Learning outcomes	<p><i>Knowledge and understanding.</i> (a) adequate knowledge and understanding of the application of appropriate statistical tools for studying the chemical and sensory markers of food products quality and authenticity; (b) autonomous ability of devising and applying statistical strategies to investigate the chemical and sensory markers of quality and authenticity of food products;</p> <p><i>Applying knowledge and understanding.</i> (a) developing the capability of integrating information, both in horizontal way (technological, chemical, biological, and regulatory aspects related to the chemical and sensory analysis of food products) and in vertical way (reasonable sequence of processes affecting the composition of food products for the evaluation of their quality and authenticity);</p> <p><i>Making judgements.</i> Capability of identify critical parameters in order to improve the efficiency of the chemical and sensory analysis of food products;</p> <p><i>Communication skills.</i> Capability of clearly and exhaustively communicate notions, ideas, problems and technical solutions by interpreting and integrating the results of chemical and sensory analyses of food products to interlocutors, either professional or not, representative of the various and specific competencies in the food supply chain (agronomist, engineers, biologists, chemists, nutritionists, administrators)</p> <p><i>Learning skills.</i> Ability to achieve independence in the evaluation of statistical tools for the analysis of chemical and sensory data from food products, with an appropriate level of autonomy in the interpretation of results.</p>
Assessment	A project work developed by the student will be assessed: presentation and discussion of a topic related to the contents of the course agreed between lecturer and

	students; the final mark is attributed in thirties.
Assessment language	English
Evaluation criteria and criteria for awarding marks	<p>Successful completion of the examination will lead to grades ranging from 18 to 30 with honors.</p> <p>Relevant for the final exam: clarity of the presentation, mastery of language, ability to summarize, evaluate, and establish relationships between topics; relevant for project work: ability to work in a team, creativity, skills in critical thinking, ability to summarize in own words</p>
Required readings	Keynotes and scientific publications provided by the lecturer. Some material is available on OLE (course page) upon enrollment
Suggested readings	"Chemometrics in Food Chemistry" (ed. Federico Marini); "Chemometrics with R" (ed. Springer); "Introduction to Multivariate Statistical Analysis in Chemometrics" (ed. CRC Press); other specific learning material will be proposed during the course.