Stampare su carta intestata del CdS

General information	
Academic subject	*Biotechnologies for shelf life improvement*
Degree course	*Innovation Development in Agrifood Systems*
Academic Year	*2021-2022*
European Credit Transfer and Accumulation System (ECTS)	3
Language	*English*
Academic calendar (starting and ending date)	*October 18th 2021 - January 28th 2022*
Attendance	*No compulsory attendance*

Professor/ Lecturer	
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Department and address	*Dipartimento di Scienze del Suolo, della Pianta e degli Alimenti, via Amendola 165/a, 70126 Bari (ITALY)*
Virtual headquarters	
Tutoring (time and day)	From Monday to Friday (8:00 am – 6:00 pm) only by appointment

Syllabus	
Learning Objectives	*To provide competencies about novel technologies, based on microorganisms or natural compounds, for increasing shelf-life of food.*
Course prerequisites	*Knowledge of basic microbiology*
Contents	1. *Protective microbial cultures (0.5 ECTS, lectures).* 2. *Natural antimicrobials from animal and vegetable sources (0.5 ECTS, lectures).* 3. *Food wastes and by-products as valuable sources of antimicrobial compounds (0.5 ECTS, lectures).* 4. *Applicative features of protective cultures and natural antimicrobials (0.5 ECTS, lectures).* 5. *Case-studies about use of protective cultures and/or natural antimicrobials for prolonging shelf-life of dairy and meat products, cereal-based foods, and fresh cut vegetables (1 ECTS, "hands on" classes).*
Books and bibliography	• *Charis Galanakis. Food Quality and Shelf Life. Academic Press, 2019.* • *Persis Subramaniam, Peter Wareing. The Stability and Shelf-life of Food – 2nd edition. Woodhead Publishing, 2016* • *Farris, G. A., M. Gobbetti, E. Neviani, M. Vincenzini. Microbiologia dei prodotti alimentari. Casa Editrice Ambrosiana, 2012.*
Additional materials	*Notes from lectures and "hands on" classes. Presentations (in pdf) provided by the teacher.*

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
75	*16*	*14*	*45*
ECTS			
3	*2*	*1*	
Teaching strategy			

	Lectures will be presented through Powerpoint slides. Powerpoint presentations, in pdf format, will be shared with students through a mailing list and/or will be available on a dedicated virtual class (created in Microsoft Teams). "Hands-on" classes will consist in the analysis and discussion of case studies. Projection of educational videos is also included as supplementary teaching method. *Lectures and "hands-on" classes will be held in "blended learning" mode.*
Expected learning outcomes	
Knowledge and understanding on:	o Knowledge about protective microbial cultures and natural antimicrobial compounds o Knowledge about applications of protective cultures and natural antimicrobials for increasing shelf-life of food
Applying knowledge and understanding on:	o Applying novel technologies based on protective cultures and/or natural antimicrobial compounds to increase shelf-life of perishable food
Soft skills	• *Making informed judgments and choices about* o Innovation in managing food losses • *Communicating knowledge and understanding* o Ability to transfer to food industries technologies, based on protective cultures and/or natural antimicrobials, to increase shelf-life of perishable food o Ability to popularize her/his knowledge to policy makers • *Capacities to continue learning* o Ability to increase personal knowledge about application of protective cultures and natural antimicrobials to improve food shelf-life

Assessment and feedback	
Methods of assessment	*The exam consists of an oral dissertation on the topics developed during the lectures and "hands-on" classes.* *Students attending at the lectures may have a middle-term preliminary exam, consisting of a written test, relative to the first part of the program, which will concur to the final evaluation and will be considered valid for one year.*
Evaluation criteria	• *Knowledge and understanding* o Mechanisms of action of protective microbial cultures and natural antimicrobial compounds. Sources of antimicrobials o Application of protective cultures and natural antimicrobials to increase shelf-life of fresh dairy and meat products, cereal-based foods and fresh cut vegetables • *Applying knowledge and understanding* o Applying technologies, based on protective cultures and/or natural antimicrobial compounds, to increase food shelf-life • *Autonomy of judgment* o The student can make informed judgments and choices about novel technologies for increasing shelf-life of food. • *Communicating knowledge and understanding* o The student can communicate technologies, based on protective cultures and/or natural antimicrobial compounds, that increase shelf-life of food to industries and policy makers. • *Communication skills* o The student can communicate her/his knowledge using an appropriate and simple lexicon, which may be understood by academicians, personnel managing food

	industries and policy makers. • *Capacities to continue learning* o The student can autonomously increase her/his personal knowledge about application of protective cultures and natural antimicrobial compounds to increase shelf-life of food. In addition, she/he can usefully blend the knowledges learned during the course in "Biotechnologies for shelf life improvement" with the knowledges from other courses.
Criteria for assessment and attribution of the final mark	*The method of assessment is detailed in the Academic Regulations for the Master of Science Degree in Innovation Development in Agrifood Systems (article 9).*
Additional information	