

General information	
Academic subject	MICROBIAL CULTURES AND ENZYMES IN FOOD TECHNOLOGY (integrated exam of INDUSTRIAL MICROBIOLOGY AND PACKAGING)
Degree course	Foods of animal origin safety and health – (LM86)
Academic Year	2022/2023 – II year
European Credit Transfer and Accumulation System (ECTS)	6
Language	Italian
Academic calendar (starting and ending date)	I semester
Attendance	Free – not mandatory

Professor/ Lecturer	
Name and Surname	Erica Pontonio
E-mail	erica.pontonio@uniba.it
Telephone	080-5442945
Department and address	Campus of Veterinary Medicine, S.P. 62 to Casamassima km 3, 70010 Valenzano (Ba)
Virtual headquarters	Cod. TEAMS bi3e7yi
Tutoring (time and day)	Monday-Friday 8.30-13.30 e 14.30-17.30 (appointment required by email)

Syllabus	
Learning Objectives	The course aims to deepen the knowledge relating to traditional and innovative biotechnologies with particular focus on the main agri-food chains. The selection and use of microbial starters and enzymes, for the optimization of new processes and / or products, will also be studied based on what is reported in the most recent scientific literature. Students will therefore learn what the role of microorganisms is in the management of a process aimed at producing a food with well-defined structural, sensory and nutritional characteristics.
Course prerequisites	Biology of microorganisms and biochemistry
Contents	Traditional and innovative food biotechnologies Production and use of microbial starters and enzymes Cytological and metabolic characteristics of lactic bacteria: metabolism of carbohydrates, nitrogenous substances, production of antimicrobial and functional compounds, production of exopolysaccharides, environmental adaptation. The supply chains of yogurt, cheeses, leavened bakery products, other vegetable products, sausages. Biochemical characteristics of yeasts and principles of oenological microbiology. Cytological and metabolic characteristics of yeasts. The wine and beer supply chain.
Books and bibliography	- Microbiologia alimentare applicata, Casa Editrice Ambrosiana (2022); -Farris, Gobbetti, Neviani, Vincenzini. Microbiologia dei prodotti alimentari, Casa Editrice Ambrosiana (2012); -Jay, J.M. Modern Food Microbiology. 5.a ed. London: Chapman & Hall International Thomson Publishing (1997). -I pani tipici. Biotecnologia dei prodotti lievitati da forno. p. 263-283, MILANO: Casa Editrice Ambrosiana, ISBN/ISSN: 978-88-08-18121-3. - De Felip, G. Recenti Sviluppi di Igiene e Microbiologia degli Alimenti. Milano: Tecniche Nuove (2001).
Additional materials	Notes from lectures and scientific papers



Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
150	60	25	65
ECTS			
6	5	1	
Teaching strategy			
Frontal lesson - blended learning			
Expected learning outcomes			
Knowledge and understanding on:	Understanding the scientific approach aimed at the use of enzymes and microorganisms for the enhancement of traditional and innovative food matrices to be used in food production.		
Applying knowledge and understanding on:	Students must know and be able to apply current methodologies based on the use of microorganisms and/or enzymes aimed at enhancing traditional and innovative food matrices to be used in food production		
Soft skills	<ul style="list-style-type: none"> • Making informed judgments and choices At the end of the course, the student must be able to assess business needs/problems and optimize suitable biotechnological processes at the laboratory level and imagining a possible industrial scale-up. • Communicating knowledge and understanding At the end of the course, the student must be able to communicate with business and academic realities regarding the biotechnological approaches using microorganisms and/or enzymes. • Capacities to continue learning At the end of the course, the student must have acquired considerable autonomy of judgment in the context of the specific themes of the current biotechnological approaches used in business and academic realities for the enhancement and transformation of traditional and alternative food matrices. 		

Assessment and feedback	
Methods of assessment	
Evaluation criteria	<ul style="list-style-type: none"> • Knowledge and understanding Understand the new scientific approaches aimed at the use of enzymes and microorganisms for the enhancement of traditional and innovative food matrices to be used in food production. • Applying knowledge and understanding Students must know and know how to apply current methodologies to the enhancement of traditional and innovative food matrices to be used in food production. • Autonomy of judgment Acquisition of considerable autonomy of judgment in the context of the specific issues of current biotechnological approaches based on the use of microbial cultures and/or enzymes for the enhancement / transformation of traditional and innovative food stocks. • Communicating knowledge and understanding At the end of the course, the student must know how to communicate with business and academic realities regarding the biotechnological approaches using microbial cultures and enzymes. • Communication skills Ability to disseminate the knowledge acquired on current biotechnological approaches based on the use of microbial cultures and/or enzymes for the enhancement/transformation of traditional and innovative food stocks.



	<p>Capacities to continue learning</p> <p>Knowledge of this module is tested during lectures, practical lessons and guided tours. It is also verified through the case studies proposed during the learning activities. In addition to ascertaining the acquisition of notions and correct scientific terminology.</p>
Criteria for assessment and attribution of the final mark	<p>The exam consists of an oral test on the topics developed during the theoretical and theoretical-practical lessons. The evaluation is expressed out of thirty.</p> <p>The exam can be done in English.</p>
Additional information	