

General information	
Academic subject	Ecophysiology and Control of food-related microorganisms (I.C. Biology and Ecophysiology of Food-related microorganisms)
Degree course	Food Science and Technology (L26)
Academic Year	second
European Credit Transfer and Accumulation System (ECTS)	6 ECTS
Language	<i>Italian</i>
Academic calendar (starting and ending date)	<i>February 27th, 2023 – June 16th, 2023</i>
Attendance	<i>No Compulsory</i>

Professor/ Lecturer	
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Virtual headquarters	<i>Microsoft teams</i>
Tutoring (time and day)	Monday-Friday 9.00-17.00

Syllabus	
Learning Objectives	The student will acquire knowledge and skills on the microbial ecophysiology and on the control of food microorganisms, as well as on the main laboratory techniques for the determination of pathogenic and spoilage microorganisms in food.
Course prerequisites	Prerequisites: C.I. General and food biochemistry
Contents	<i>Microbial cell physiology and microbial growth in response to environmental parameters. Outlines of environmental adaptation. Control of microbial growth in foods. Determination of the microbial growth in food. Food-related microorganisms in animal and vegetable not-fermented products</i>
Books and bibliography	Farris, Gobbetti, Neviani, Vincenzini. Microbiologia dei prodotti alimentari. Casa Editrice Ambrosiana. 2012. Cocolin, Gobbetti, Neviani. Microbiologia alimentare applicata. Zanichelli, 2022. Jay, Loessner, Golden. Modern Food Microbiology. Food Science Text series. 2006.
Additional materials	Notes, slides and other bibliographic materials will be furnished during the course

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/Self-study hours
Hours			
150	32	28	90
ECTS			
6	4	2	
Teaching strategy	<i>Lectures will be presented through PC assisted tools (PowerPoint, video). Field and laboratory classes will be experienced. Lecture notes and educational supplies will be provided by means of online platforms</i>		

Expected learning outcomes	The expected learning outcomes, in terms of both knowledge and skills, are provided in Annex A of the Academic Regulations of the Degree in Food Science and Technology (expressed through the European Descriptors of the qualification)
Knowledge and understanding on:	<ul style="list-style-type: none"> ○ Knowledge and understanding of microbial cell physiology and microbial growth in response to environmental parameters ○ Knowledge of spoilage and pathogenic microorganisms in vegetable- and animal-derived food
Applying knowledge and understanding on:	<ul style="list-style-type: none"> ○ Knowledge of the main methods for determination and control of microorganisms in food ○ Skill to work in laboratories wherein food-related microorganisms are cultivated isolated and identified
Soft skills	<ul style="list-style-type: none"> ● <i>Making informed judgments and choices</i> <ul style="list-style-type: none"> ○ Correctly advising solutions to control microorganisms in food ● <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> ○ Describing the microbial cell physiology and microbial growth in response to environmental parameters ● <i>Capacities to continue learning</i> <ul style="list-style-type: none"> ○ Updating the knowledge of methods to use starter and monitor spoilage and pathogenic microorganisms growth in vegetable- and animal-derived food
The expected learning outcomes, in terms of both knowledge and skills, are provided in Annex A of the Academic Regulations of the Degree in Food Science and Technology (expressed through the European Descriptors of the qualification).	

Assessment and feedback	
Methods of assessment	<p>The exam consists of an oral dissertation on the topics developed during the theoretical and theoretical-practical lectures in the classroom and in the laboratory production plants, as reported in the Academic Regulations for the Bachelor Degree in Food Science and Technology (article 9) and in the study plan (Annex A).</p> <p>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 a year.</p> <p>The evaluation of the preparation of the student occurs on the basis of established criteria, as detailed in Annex B of the Academic Regulations for the Bachelor's degree in food science and Technology.</p> <p>The foreign student's profit test can be done in English in the way described above.</p>
Evaluation criteria	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Describing microbial cell physiology and microbial growth in response to environmental parameters ○ Describing spoilage and pathogenic microorganisms in vegetable- and animal-derived food <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Describing the main methods for determination and control of microbial cell densities in food <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> ○ Expressing reasonable hypotheses about solutions to control microbial cell densities in laboratories wherein food-related microorganisms are cultivated <p><i>Communicating knowledge and understanding</i></p>

	<p>Describing the microbial cell physiology and microbial growth in response to environmental parameters</p> <p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> ○ Expressing reasonable hypotheses about use of starter and the monitoring of spoilage and pathogenic microorganisms growth in vegetable- and animal-derived food
Criteria for assessment and attribution of the final mark	<p>The evaluation criteria that contribute to the attribution of the final mark will be: knowledge and understanding, the ability to apply knowledge, autonomy of judgment, i.e. the ability to criticize and formulate judgments, communication skills</p>
Additional information	