

General information	
Academic subject	<i>Biology of microorganisms (I.C. Biology and Ecophysiology of Food-related microorganisms)</i>
Degree course	<i>Food Science and Technology (L26)</i>
Academic Year	<i>Second</i>
European Credit Transfer and Accumulation System (ECTS)	3 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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Department and address	<i>DIP. DISSPA – Università degli Studi di Bari</i>
Virtual headquarters	<i>Microsoft Teams</i>
Tutoring (time and day)	<i>Monday-Friday 8.00-18.00, only by appointment</i>

Syllabus	
Learning Objectives	<i>The student will acquire knowledge about microbial biology, cytology, and biochemistry, as well as about the most technical aspects of cultivation, growth, isolation, and taxonomic allotment, in order to control over the potentialities of food-related microorganisms and their pro-technological, spoiling, and pathogenic role.</i>
Course prerequisites	<i>Prerequisites: Food biochemistry</i>
Contents	<ul style="list-style-type: none"> ● <i>Principles of prokaryotic cell biology: morphology, cytology, genomics, chemotaxis.</i> ● <i>Virus. Phages.</i> ● <i>Microbial catabolic reactions: fermentations, anaerobic and aerobic respiration.</i> ● <i>Basic techniques in microbiology: culture media; isolation of microorganisms from food items, including examination of morphological, physiological and cultivation traits. Kinetics of microbial growth in batch culture systems and notions about continuous culture systems.</i> ● <i>Microbial taxonomy: nomenclature, classification and identification.</i>
Books and bibliography	<p><i>Notes from lectures and laboratory classes. Presentations (in pdf) provided by the lecturer.</i></p> <p><i>Additional readings</i></p> <ul style="list-style-type: none"> ● <i>Madigan, Bender, Buckley, Sattley, Stahl. Brock – Biology of Microorganisms. 15th ed. London: Pearson, 2018.</i> ● <i>Jay, J.M., M.J. Loessner, D.A. Golden. Modern Food Microbiology. 7th ed. Springer Verlag, 2006.</i> ● <i>Cappuccino, J.G., Sherman, N. Microbiology – A laboratory manual. Ninth edition. Benjamin Cummings, an imprint of Pearson, 2011.</i>
Additional materials	

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	2.0	1.0	
Teaching strategy		Lectures will be presented through PC assisted tools (Powerpoint) and slide projector. Projection of educational videos is also included as supplementary teaching method. Powerpoint presentations, in pdf format, will be shared with students through the Microsoft TEAMS platform.	
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 about main structures and functions of microbial cells, microbial growth and taxonomy, as well as about basic techniques in microbiology 	
Applying knowledge and understanding on:		<ul style="list-style-type: none"> ○ To know the potential of microorganisms in relation to pro-technological, spoiling or pathogenic role 	
Soft skills		<ul style="list-style-type: none"> ● <i>Making informed judgments and choices</i> <ul style="list-style-type: none"> ○ To acquire information needed for evaluating the potential role of microorganisms in food ● <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> ○ Ability to describe the main structures of microbial cells and catabolic pathways, microbial growth, classification, nomenclature and identification of microorganisms, as well as basic techniques in microbiology ● <i>Capacities to continue learning</i> <ul style="list-style-type: none"> ○ Ability to increase knowledge for evaluating the potential role of microorganisms in 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 Degree in Food Science and Technology.</p>

	Non-Italian students may be examined in English language, according to the aforesaid procedures.
Evaluation criteria	<ul style="list-style-type: none"> ● <i>Knowledge and understanding</i> <ul style="list-style-type: none"> ○ To describe the main structures and functions of microbial cells, microbial growth and taxonomy, as well as about basic techniques in microbiology ● <i>Applying knowledge and understanding</i> <ul style="list-style-type: none"> ○ To describe the potential of microorganisms in relation to pro-technological, spoiling or pathogenic role ● <i>Autonomy of judgment</i> <ul style="list-style-type: none"> ○ To describe how to evaluate the potential role of microorganisms in food ● <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> ○ To describe the main structures of microbial cells and catabolic pathways, microbial growth, classification, nomenclature and identification of microorganisms, as well as basic techniques in microbiology ● <i>Communication skills</i> <ul style="list-style-type: none"> ○ The student will be evaluated in terms of use of appropriate technical language. ● <i>Capacities to continue learning</i> <ul style="list-style-type: none"> ○ To describe how to increase knowledge for evaluating the potential role of microorganisms in food
Criteria for assessment and attribution of the final mark	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
Additional information	