

COURSE OF STUDY *Master degree: Food Science and Technology (LM70)*
ACADEMIC YEAR *2023-2024*
ACADEMIC SUBJECT *Biotechnologies for valorization of wastes and by-products for food use (3 ECTS) - I.C. Sustainability of agri-food supply chains (9 ECTS)*

General information	
Year of the course	<i>Second</i>
Academic calendar (starting and ending date)	<i>1 semester (25/09/2023-19/01/2023)</i>
Credits (CFU/ETCS):	<i>3</i>
SSD	<i>Agricultural microbiology (AGR/16)</i>
Language	<i>Italian</i>
Mode of attendance	<i>No Compulsory</i>

Professor/ Lecturer	
Name and Surname	<i>Pasquale Filannino</i>
E-mail	<i>pasquale.filannino1@uniba.it</i>
Telephone	<i>0805442948</i>
Department and address	<i>DIP. DISSPA – Università degli Studi di Bari</i>
Virtual room	<i>Microsoft Teams: code c59arsp</i>
Office Hours (and modalities: e.g., by appointment, on line, etc.)	<i>Monday to Friday by appointment only.</i>

Work schedule			
Hours			
Total	Lectures	Hands-on (laboratory, workshops, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
<i>75</i>	<i>16</i>	<i>14</i>	<i>45</i>
CFU/ETCS			
<i>3</i>	<i>2</i>	<i>1</i>	

Learning Objectives	<i>The student will acquire knowledge and skills on microbiology applied to food waste valorization strategies and bio-processes for food waste/by-products reduction.</i>
Course prerequisites	<i>Knowledge of Biochemistry, Enzymology, Biology, General Microbiology, Food Technology, Food Chemistry. Knowledge of the main food technologies and food supply chains.</i>

Teaching strategie	<i>Course topics are addressed with the aid of Power Point presentations, case study analysis, reading of regulatory texts, and classroom or laboratory practice.</i>
Expected learning outcomes in terms of	
Knowledge and understanding on:	<ul style="list-style-type: none"> • Knowledge of the main advanced microbiological methods for selection and use of microbial starter; • Knowledge of the main biotechnological strategies to valorise food wastes and by-products.
Applying knowledge and understanding on:	<ul style="list-style-type: none"> • Mastership of advanced microbiological techniques to valorise food wastes and by-products;

	<ul style="list-style-type: none"> • Mastership of biotechnologies applied to the valorisation of food wastes and by-products.
Soft skills	<ul style="list-style-type: none"> • Making informed judgments and choices: <ul style="list-style-type: none"> ○ Ability to manage the selection process of microbial starter to valorise wastes and by-products through the application of biotechnologies; ○ Acquisition of considerable autonomy of judgment in the context of the specific themes of biotechnologies applied to the wastes and by-products valorisation, and to the sustainability of food processes; ○ Ability to provide a critical interpretation of the results of biotechnological processes. • Communicating knowledge and understanding: <ul style="list-style-type: none"> ○ Ability to communicate the acquired theoretical concepts in oral and written form, using appropriately the scientific language and the specific lexicon of microbiology applied to biotechnologies; ○ Ability to describe, also through applicative cases, the practical aspects and potential effects of this discipline on the research and development activities in food industry and food industry. • Capacities to continue learning: <ul style="list-style-type: none"> ○ Ability to deepen and update knowledge regarding the application of biotechnologies for the valorisation of wastes and by-products in food industries; ○ Ability to deepen and update knowledge concerning the application of biotechnologies to innovative raw materials for the production of novel foods and food supplements.
Syllabus	
Content knowledge	<ul style="list-style-type: none"> • Microbial biotechnologies for the extraction or transformation of molecules and compounds of technological and / or functional interest from food wastes and by-products; • Microbial biotechnologies for the reuse of food wastes and by-products in food formulations; • Bioprocesses for the reduction of wastes in the food supply chains.
Texts and readings	<ul style="list-style-type: none"> • Lecture notes and lecture materials provided during the course. • <i>Food Waste to Valuable Resources: Applications and Management.</i> Rajesh Banu, Gopalakrishnan Kumar, Gunasekaran M., Kavitha S. 2020 • <i>Food Industry Wastes: Assessment and Recuperation of Commodities.</i> Maria R. Kosseva, Colin Webb. 2013.
Notes, additional materials	<ul style="list-style-type: none"> • Scientific papers
Repository	All teaching material will be available to students on web platforms (class Teams code c59arsp).
Assessment	
Assessment methods	<p>The exam consists of an oral dissertation on the topics developed during the theoretical and theoretical-practical lectures in the classroom and in practical activities (laboratory and educational visits).</p> <p>Students 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 academic year (Art. 4 of the Didactic Regulations of the Master's Degree Course in Food Science and Technology). The result of the mid-term exam is communicated by publication in the student's electronic register and contributes to the assessment of the profit examination by means of calculation of the weighted average.</p> <p>The exam for foreign students may be conducted in English as described above.</p>

<p>Assessment criteria</p>	<ul style="list-style-type: none"> • Knowledge and understanding: <ul style="list-style-type: none"> ○ Describing the main advanced microbiological methods for selection and use of microbial starter; ○ Describing the main biotechnological strategies to valorise food wastes and by-products. • Applying knowledge and understanding: <ul style="list-style-type: none"> ○ Applying advanced microbiological techniques to valorise food wastes and by-products; ○ Applying microbial biotechnologies to the valorisation of food wastes and by-products. • Autonomy of judgment: <ul style="list-style-type: none"> ○ Managing the selection process of microbial starter to valorise wastes and by-products through the application of biotechnologies; ○ Autonomy of judgment in the context of the specific themes of biotechnologies applied to the wastes and by-products valorisation, and to the sustainability of food processes; ○ Providing a critical interpretation of the results of biotechnological processes. • Communicating knowledge and understanding: <ul style="list-style-type: none"> ○ Describing, also through applicative cases, the practical aspects and potential effects of this discipline on the research and development activities in food industry. • Communication skills: <ul style="list-style-type: none"> ○ Communicating the acquired theoretical concepts in oral and written form, using appropriately the scientific language and the specific lexicon of microbiology applied to biotechnologies; • Capacities to continue learning: <ul style="list-style-type: none"> ○ Deepening and updating knowledge regarding the application of microbial biotechnologies for the valorisation of wastes and by-products in food industries. ○ Deepening and updating knowledge concerning the application of microbial biotechnologies to innovative raw materials for the production of novel foods and food supplements.
<p>Final exam and grading criteria</p>	<p>The assessment of the student's preparation is based on predetermined criteria in accordance with the Didactic Regulations of the Master's Degree Course in Food Science and Technology (art. 4).</p> <p>The Examination Committee has a score ranging from a minimum of 18 to a maximum of 30 points for a positive assessment of the student's performance. By unanimous vote of its members, the Board may award honours in cases where the final mark is 30.</p>
<p>Further information</p>	<p>.</p>