General Information	
Academic subject	Biotechnologies for valorization of wastes and by-products for food use
Degree course	Master degree: Food Science and Technology (LM70)
Curriculum	
ECTS credits	3 ECTS (2 ECTS Lectures + 1 ECTS Laboratory)
Compulsory attendance	No
Language	Italian

Subject teacher	Name Surname	Mail address	SSD
	Pasquale Filannino	pasquale.filannino1@uniba.it	AGR/16

ECTS credits details			
Basic teaching activities	2 ECTS Lectures	1 ECTS Laboratory	

Class schedule	
Period	First semester
Year	Second
Type of class	Lectures- Laboratory

Time management	
Hours	75
In-class study hours	30
Out-of-class study hours	45

Academic calendar	
Class begins	September 22nd, 2021
Class ends	January 21st, 2022

Syllabus	
Prerequisites/requirements	Knowledge of Biochemistry, Enzymology, Biology, General Microbiology, Food Technology, Food Chemistry. Knowledge of the main food technologies and food supply chains. Basic knowledge of Mathematics and Statistics.
Expected learning outcomes	*Knowledge and understanding* o Knowledge of the main advanced microbiological methods for selection and use of microbial starter; o Knowledge of the main biotechnological strategies to valorise food wastes and by-products. *Applying knowledge and understanding* o Mastership of advanced microbiological techniques to valorise food wastes and by-products; o Mastership of biotechnologies applied to the valorisation of food wastes and by-products. *Making informed judgements and choices* o Ability to manage the selection process of microbial starter to valorise wastes and by-products through the application of biotechnologies; o 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; o Ability to provide a critical interpretation of the results of biotechnological processes. *Communicating knowledge and understanding*

	o Ability to communicate the acquired theoretical concepts in oral and written form, using appropriately the scientific language and the specific lexicon of predictive microbiology applied to biotechnologies; o 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 of continue learning* o Ability to deepen and update knowledge regarding the application of biotechnologies for the valorisation of wastes and by-products in food industries; o Ability to deepen and update knowledge concerning the application of biotechnologies to innovative raw materials for the production of novel foods and food supplements. The expected learning outcomes, in terms of knowledge and skills, are shown on Annex A of the Teaching Regulations of the Master's Degree Program (expressed through the European Descriptors of the qualification).
Contents	• 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.
Course program	
Bibliography	• Lecture notes and educational supplies provided during the course • Scientific papers • Food Waste to Valuable Resources: Applications and Management. Rajesh Banu, Gopalakrishnan Kumar, Gunasekaran M., Kavitha S. 2020 • Food Industry Wastes: Assessment and Recuperation of Commodities. Maria R. Kosseva, Colin Webb. 2013.
Notes	
Teaching methods	Lectures will be presented through digital tools (PowerPoint presentation, video). Laboratory classes will be performed.
Assessment methods (indicate at least the type written, oral, other)	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 Master Degree in Food Science and Technology (article 9) and in the study plan (Annex A). 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. 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 Master Degree in Food Science and Technology. Non-Italian students may be examined in English language, according to the aforesaid procedures.
Evaluation criteria	*Knowledge and understanding* o Describing the main advanced microbiological methods for selection and use of microbial starter;

	o Describing the main biotechnological strategies to valorise food wastes and by-products.
	Applying knowledge and understanding
	o Applying advanced microbiological techniques to valorise food wastes and by-products;
	o Applying microbial biotechnologies to the valorisation of food wastes and by-products.
	Making informed judgements and choices
	o Managing the selection process of microbial starter to valorise wastes and by-products through the application of biotechnologies;
	o 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;
	o Providing a critical interpretation of the results of biotechnological processes.
	Communicating knowledge and understanding
	o Communicating the acquired theoretical concepts in oral and written form, using appropriately the scientific language and the specific lexicon of microbiology applied to biotechnologies;
	o Describing, 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 of continue learning
	o Deepen and updating knowledge regarding the application of microbial biotechnologies for the valorisation of wastes and by-products in food industries.
	o Deepening and updating knowledge concerning the application of microbial biotechnologies to innovative raw materials for the production of novel foods and food supplements.
Further information	Visiting hours: from Monday to Thursday 9.00 a.m. – 17.30 p.m. by appointment only.