COURSE OF STUDY *Master degree: Food Science and Technology (LM70)*
ACADEMIC YEAR *2023-2024*
ACADEMIC SUBJECT *Biochemical Methods for Food Quality Control*

General information	
Year of the course	II
Academic calendar	Second semester (February 26th – June 7th, 2024)
Credits (CFU/ETCS)	6
SSD	AGR/13 Chimica Agraria
Language	Italian
Mode of attendance	Facultative

Professor/ Lecturer	
Name and Surname	Carmine Crecchio
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Telephone	080 5442854
Department and address	1 floor old building former Agriculture Faculty, room n.7
Virtual room	teams
Office Hours (and modalities: e.g., by appointment, on line, etc.)	From Mon to Fri: 10,00 -12,00 in presence; all afternoons by "teams" as for appointment

Work schedule	

Hours			
Total	Lectures	Hands on	Out-of-class study hours/ Self-study hours
150	32	28	90
CFU/ETCS			
6	4	2	

Learning Objectives	The student will acquire knowledge and skills on the main biochemical techniques used to evaluate the quality of food, their origin and their alterations, as well as on the purification, immobilization and use of enzymes in food technology.
Course prerequisites	Basic knowledge in biochemistry and enzymology

Teaching strategy	Lectures will be presented through PC assisted tools (PowerPoint, video). Field and laboratory classes, reading of regulations will be experienced. Lecture notes and educational supplies will be provided by means of online platforms

Expected learning outcomes in terms of	
Knowledge and understanding on	Introduction to applied biochemistry to evaluate food quality.

Applying knowledge and understanding on	Knowledge of the biochemical system in which the main techniques, used for food quality evaluation, operate.
Soft skills	Making informed judgments and choices: Capacity to use the acquired information to be used for further studies. Communicating knowledge and understanding: Capacity to describe the biochemical methods useful to determine and improve food quality. Capacities to continue learning: Capacity to upgrade at higher levels the knowledge relative to biochemical methods used in food quality control.
Content knowledge	Enzyme catalysis: generalities; equations and parameters of enzyme catalysis; enzyme inhibition. Analitical determinations in enzymology. Extraction and purification of enzymes: sources of extraction, strategies, lysis, centrifugation and filtration of cell extracts, low and high efficiency purifications. Immobilized enzymes. Applications of enzymes in food industry. Immunological methods: immunological response; production and purification of antibodies; immunoprecipitation; antibody labelling; immunoistochemistry ; immunoblotting. Food fingerprinting: mass spectroscopy and NMR. Biosensors: introduction and principles. Equipments of first, second and third generation. Applications in food compartment.
Texts and readings	Biochimica industriale – Verga, Pilone – Sprinter. Introduzione alla Biochimica di Lehninger – Sesta Edizione Nelson, Cox – Zanichelli Principi di Biochimica – Settima edizione, Nelson, Cox – Zanichelli. Wilson, Walker. Biochimica e biologia molecolare – Principi e tecniche. Raffaello Cortina Ed. Wilson, Walker. Metodologia biochimica: le bioscienze e le biotecnologie. Raffaello Cortina Ed. Skoog, West, Holler. Fondamenti di Chimica Analitica, Edises.
Additional materials	Notes, slides and other bibliographic materials will be furnished during the course
Repository	Available inTeams class

Assessment	
Assessment methods	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.
Assessment criteria	Knowledge and understanding: Describe the main biochemical techniques useful for food quality control. Applying knowledge and understanding: Describe the importance of biochemistry to evaluate the proper approaches able to properly investigate food quality Autonomy of judgment: The student will be able to express reasonable hypotheses about choice of methods for evaluating food quality. Communicating knowledge and understanding: Capacity to describe how to control and improve food quality by biochemical methods. Communication skills
Final exam and grading criteria	The evaluation criteria that contribute to the attribution of the final mark (/30) will be: knowledge and understanding, the ability to apply knowledge, autonomy of judgment, i.e. the ability to criticize and formulate judgments, communication skills
Further information	