

General information		
Academic subject	Biochemical Methods for Food Quality Control	
Degree course	Food Science and Technology (LM70)	
Academic Year	Second	
European Credit Transfer and Accumulation System (ECTS)		6 ECTS
Language	Italian	
Academic calendar (starting and ending date)	February 27 th , 2023 – June 16, 2023	
Attendance	No Compulsory	

Professor/ Lecturer	
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Department and address	DiSSPA
Virtual headquarters	Microsoft Teams
Tutoring (time and day)	Monday-Friday 9.00-16.00

Syllabus	
Learning Objectives	<i>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.</i>
Course prerequisites	<i>Basic knowledge in biochemistry and enzymology</i>
Contents	<i>Enzyme catalysis: generalities; equations and parameters of enzyme catalysis; enzyme inhibition. Analytical 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.</i>
Books and bibliography	Slides used during the course. Biochimica industriale – Verga, Pilone – Springer. Principi di Biochimica – Settima edizione, Nelson, Cox – Zanichelli. Introduzione alla Biochimica di Lehninger – Sesta 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	<i>Notes, slides and other bibliographic materials will be furnished during the course</i>

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		<p>Lectures will be presented through PC assisted tools (PowerPoint, video). Field and laboratory classes, reading of regulations will be experienced.</p> <p>Lecture notes and educational supplies will be provided by means of online platforms</p>	
Expected learning outcomes		<p>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)</p>	
Knowledge and understanding on:		<ul style="list-style-type: none"> • Introduction to applied biochemistry to evaluate food quality. 	
Applying knowledge and understanding on:		<ul style="list-style-type: none"> • Knowledge of the biochemical system in which the main techniques, used for food quality evaluation, operate. 	
Soft skills		<ul style="list-style-type: none"> • <i>Making informed judgments and choices</i> Capacity to use the acquired information to be used for further studies. • <i>Communicating knowledge and understanding</i> Capacity to describe the biochemical methods useful to determine and improve food quality. • <i>Capacities to continue learning</i> Capacity to upgrade at higher levels the knowledge relative to biochemical methods used in food quality control. 	
<p>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).</p>			

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 Master 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 Master Degree in Food Science and Technology.</p> <p>Non-Italian students may be examined in English language, according to the aforesaid procedures.</p>
Evaluation criteria	<ul style="list-style-type: none"> • <i>Knowledge and understanding</i> Describe the main biochemical techniques useful for food quality control. • <i>Applying knowledge and understanding</i> Describe the importance of biochemistry to evaluate the proper approaches able to properly investigate food quality • <i>Autonomy of judgment</i> The student will be able to express reasonable hypotheses about choice of methods for evaluating food quality. • <i>Communicating knowledge and understanding</i>

	<p><i>Capacity to describe how to control and improve food quality by biochemical methods.</i></p> <ul style="list-style-type: none"> • <i>Communication skills</i> <i>The student will be evaluated considering the use of appropriate technical language.</i> • <i>Capacities to continue learning</i> <i>Capacity to use and apply the biochemical background to control food quality.</i>
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	