COURSE OF STUDY *Master degree: Food Science and Technology (LM70)*
ACADEMIC YEAR *2023-2024*
ACADEMIC SUBJECT *Advanced food technologies (3 ECTS) - I.C. Food technologies, sensory analysis and packaging (9 ECTS)*

General information	
Year of the course	*First*
Academic calendar (starting and ending date)	*II semester (February 26th – June 14th, 2024)*
Credits (CFU/ETCS):	3
SSD	*Food Science and Technology (AGR/15)*
Language	*Italian*
Mode of attendance	*No Compulsory*

Professor/ Lecturer	
Name and Surname	*Francesco Caponio*
E-mail	*francesco.caponio@uniba.it*
Telephone	*0805442235*
Department and address	*DIP. DISSPA – Università degli Studi di Bari Aldo Moro*
Virtual room	*Microsoft Teams*
Office Hours (and modalities: e.g., by appointment, on line, etc.)	*From Monday to Friday 8.30 a.m. – 1.30 p.m. and 2.30 p.m. – 5.30 p.m. previous agreement, also on line*

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

Learning Objectives	The student will acquire knowledge and skills relating to edible oils and fats, paying particular attention to both innovative technologies and quality and genuineness, as well as unconventional quality assurance methods. Furthermore, the course will allow to acquire knowledge and skills related to the production processes of beer and nerve foods.
Course prerequisites	Knowledge of the virgin olive oils processing technologies.

Teaching strategie	Lectures will be presented by means of Power Point presentations, videos with views of real industrial plants, didactic visit, case-studies and laboratory exercitations.
Expected learning outcomes in terms of	
Knowledge and understanding on:	• Knowledge of analytical techniques to ensure olive oil genuineness.

	● Knowledge of the potentiality to food purpose of waste and by-products of the olive-oil industry. ● Knowledge of technologies, including innovative ones, and of their influence on product quality. ● Knowledge of production processes and quality of beer and nerve foods.
Applying knowledge and understanding on:	● Mastership of the analytical techniques for virgin and refined olive oil frauds. ● Mastership of methods for valorising oil waste and by-products. ● Mastership of technological processes, including innovative ones, to ensure efficiency and quality.
Soft skills	● Making informed judgments and choices: ○ Ability to correctly guide the choices and solutions of the food industries to ensure high quality food standards. ○ Ability to evaluate an analysis report. ● Communicating knowledge and understanding: ○ Ability to communicate the acquired theoretical concepts in oral and written form, using appropriately the scientific language and the specific lexicon. ○ Ability to report the most appropriate analytical and technological solutions to guarantee the quality and authenticity of the products. ○ Ability to describe, also through applicative cases, the practical aspects and potential effects of this discipline on the research and development and quality control activities in food industry. ● Capacities to continue learning: ○ Ability to deepen and update one's knowledge regarding the quality and genuineness of foods, and olive oils in particular, and the criteria for their selection. ○ Ability to deepen and update their knowledge regarding the possibilities of management and valorisation for food use of the by-products of the oil chain.
Syllabus	
Content knowledge	Introduction. Quality and genuineness of the oils. Storage of virgin olive oils. Effects of storage on the analytical indexes. The influence of oxidation and hydrolysis compounds in the evolution of oxidation in edible oils. Examples of valorisation of waste and by-products of the oil chain for food purposes. Technological innovations for the improvement of the extraction yield and the quality of virgin olive oils. Margarines: production technology and fat quality. Fat hydrogenation, interesterification and fractionation techniques. Processing technology of animal fats and evaluation of their quality. Beer: definition and classification; characteristics of the barley and its substitutes; preparation of malt and must; brewing, pasteurisation and bottling. Nerve foods.
Texts and readings	● Notes of the lectures distributed during the course. ● Capella P., Fedeli E., Bonaga G., Lercker G. “Manuale degli oli e dei grassi”. Tecniche Nuove, Milano. ● Sunier J. “La fabbricazione del malto e della birra”. a cura dell’unione fabbricanti di birra e malto, Roma. ● Colagrande O. “Preparazione dei vini di qualità”. Chiriotti Editori, Pinerolo. ● Cabras P., Martelli A. “Chimica degli alimenti”. Piccin, Padova.

	● Cappelli P., Vannucchi V. Chimica degli alimenti. Conservazione e trasformazione. Zanichelli, Bologna.
Notes, additional materials	● Scientific papers ● Oils & fats manual. A. Karleskind Ed. Intercept Ltd, Andover, UK. ● Bailey's industrial oil & fat products. Y.H. Hui Ed. John Wiley & Sons, New York, USA.
Repository	All teaching material will be available to students on Teams platforms.

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 (Art. 4 of the Didactic Regulations of the Master's Degree Course in Food Science and Technology). The intermediate exam is evaluated out of thirty and in case of a positive outcome, in the final oral exam the interview will focus on the remaining part of the teaching contents. 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. The exam for foreign students may be conducted in English as described above.
Assessment criteria	● Knowledge and understanding: ○ Describing innovative technological solutions and analytical techniques to highlight fraud for virgin and refined olive oils. ○ Describing the potentiality of waste and by-products of the oil chain for food purposes. ○ Describing the production processes of beer and nerve foods. ● Applying knowledge and understanding: ○ Describing the relationship between food composition and shelf-life on the basis of the presented case studies. ○ Describing the analytical techniques to guarantee the authenticity of virgin and refined olive oils. ○ Describing the valorising potentiality of waste and by-products. ● Autonomy of judgment: ○ Expressing reasonable hypotheses of process choice, to ensure high quality standards of the product, and express a correct judgment on the genuineness of the same. ○ Expressing hypotheses of valorisation of waste and by-products for food purposes. ● Communicating knowledge and understanding: ○ Describing, also through applicative cases, the practical aspects and potential consequences of this discipline on the research and development and quality control activities in food industry. ● Communication skills: ○ Communicating the theoretical acquired concepts using the appropriate scientific language and the specific lexicon. ● Capacities to continue learning:

	○ Hypothesizing a possible approach for evaluating both the genuineness of the product and the technological innovations, as well as the potentiality of waste and by-products on the basis of the case studies, also stimulating group work.
Final exam and grading criteria	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. The score is based on predetermined criteria in accordance with the Didactic Regulations of the Master's Degree Course in Food Science and Technology (art. 4).
Further information	