COURSE OF STUDY *Agricultural Science and Technology*
ACADEMIC YEAR *2024/2025*
ACADEMIC SUBJECT *Agricultural Industries 6 ECTS (I.C. Foods processing technologies)*

General information		
Academic subject	Agricultural Industries	
Degree course	Agricultural Science and Technology	
Academic Year	III	
European Credit Transfer and Accumulation System (ECTS)		6
Language	Italian	
Academic calendar (starting and ending date)	II semester (03/03/2025 – 13/06/2025)	
Attendance	Not mandatory	

Professor/ Lecturer	
Name and Surname	Giacomo Squeo
E-mail	giacomo.squeo@uniba.it
Telephone	+39 080 5443467
Department and address	Dept. of Soil, Plant and Food Sciences (DISSPA), ground floor, room n. 3
Virtual headquarters	Microsoft Teams: *ku500nf*
Tutoring (time and day)	Monday to Friday by appointment only

Syllabus	
Learning Objectives	The course aims to provide knowledge and develop skills about: i) the main processing processes of the olive oils, dairy and wine sectors, as well as some hints about other supply chains; ii) the most recent technological innovations available in the aforementioned production chains; iii) the quality assessment of the foods considered.
Course prerequisites	Basic knowledge of mathematics, statistics, chemistry and physics. Knowledge of food chemistry. The exam does not require prerequisites.
Contents	**Wine sector** Chemical and biochemical constituents of grapes. Grape ripening and technological role of its components. Role of sulphur dioxide in winemaking. Red winemaking. White winemaking. Rosé winemaking. Carbonic maceration winemaking. Cloudiness and clarity of wine. Stabilization of wines. Defects and alterations of wines. Notes on innovative technologies in the cellar. Exercise activity: Principles and methodologies of common analytical procedures for wine quality control. Qualitative analysis of wines. Study visit to a cellar. **Olive oil sector** Chemical composition of the drupe, evolution of compositional characteristics during ripening. Classification of oils based on the most up-to-date regulations. Production process of virgin olive oils. Classic and innovative extraction systems.

	Rectification of oils: degumming, deacidification, decolorization, deodorization, demargarination. Exercise activity: Principles and methodologies of common analytical procedures for the quality control of virgin oils. Qualitative analysis of olive oils. **Dairy sector** The main components of milk: fat, proteins and carbohydrates. The minor components of milk: vitamins, enzymes, citric acid, non-protein nitrogen, microorganisms and cellular elements. Acid and rennet coagulation. Production process of hard and stretched curd cheese. Defects and alterations of cheeses. Production process of ricotta, cream and butter. Drinking milk. Notes on innovative technologies in the dairy industry. Exercise activity: Principles and methodologies of common analytical procedures for the quality control of milk. Qualitative analysis of dairy products. Notes on the technological processes of other food chains such as: beer, canned and semi-canned food chains.
Books and bibliography	• Cappelli, Vannucchi. Principi di chimica degli alimenti. Conservazione - Trasformazioni – Normativa. Seconda edizione, 2024. Zanichelli. ISBN: 9788808499691. • Cabras, Tuberoso. Analisi dei prodotti alimentari. Piccin-Nuova Libraria, 2013. EAN: 9788829923113.
Additional materials	Scientific Reviews and papers

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	
	The course topics will be covered with the help of presentations, videos, and other teaching materials useful for completing the learning and acquisition of knowledge. In addition, laboratory and field exercises will be carried out (e.g. technical visits to food companies).
Expected learning outcomes	
Knowledge and understanding on:	○ Knowledge of the transformation processes of the olive oil, milk and derivatives, and oenological supply chains ○ Knowledge of the chemical-physical and biological problems associated with the transformation processes ○ Knowledge of the innovative technological solutions available today ○ Knowledge of the quality assessment methodologies of the foods considered
Applying knowledge and understanding on:	○ Follow and control the main transformation processes of the studied supply chains ○ Evaluate the quality of the foods considered ○ Evaluate the correlation between the transformation process applied and the quality of the food

Soft skills	• *Making informed judgments and choices* ○ Evaluate, among alternative technological solutions, which may be the most suitable based on the specific business needs ○ Hypothesize which innovative technological solutions among those studied may be used to innovate transformation processes ○ Analyse the food products studied ○ Evaluate the quality of a transformation process based on the characteristics of the resulting food • *Communicating knowledge and understanding* ○ Describe the transformation processes of the supply chains considered ○ Describe the relationship between transformation technology, the related process parameters, and food quality ○ Present an analytical protocol for the evaluation of the quality of the foods considered ○ Describe the pros and cons of specific innovative technological solutions • *Capacities to continue learning* ○ Update yourself on the evolutions in the field of food technologies ○ Evaluate the possible advantages/disadvantages of new technological solutions ○ Hypothesize and apply the concepts and technological and analytical skills developed also in other food contexts different from those considered in the course

Assessment and feedback	
Methods of assessment	
Evaluation criteria	• *Knowledge and understanding* ○ Clear and critical description of the food production technologies covered during the course ○ Clear and critical description of the analytical methods for the evaluation of the quality characteristics of foods ○ Clear illustration of the production processes studied • *Applying knowledge and understanding* ○ Description of the correlation between production technology and product quality ○ Presentation of the advantages and disadvantages of innovative technological solutions in the context of specific production processes • *Autonomy of judgment* ○ Critical evaluation of possible technological solutions to be adopted based on specific production problems ○ Hypothesize the implementation of innovative technologies in traditional production processes ○ Deduce possible problems in the production process based on the results of food analysis ○ Express, based on the values of the analysed parameters, an opinion on the quality of the foods treated during the course • *Communicating knowledge and understanding* ○ Describe the technological processes and process parameters for the production of the foods studied ○ Describe the analytical methods underlying the evaluation of the quality of the foods studied ○ Describe the advantages and disadvantages of alternative technological solutions ○ Ability to use examples to describe the topics covered in the course

	• *Communication skills*
	  ○ Presentation using appropriate and specific language for the subject of study
	• *Capacities to continue learning*
	  ○ Formulation of modifications and/or improvements and/or adaptations of specific production processes in particular contexts
	  ○ Ability to independently identify sources for research into processes or innovative solutions to produce studied foods
	  ○ Ability to know how to adapt the knowledge and skills developed in other production contexts beyond those considered

Criteria for assessment and attribution of the final mark	The assessment of the student's preparation is based on predetermined criteria in accordance with the Didactic Regulations of the Degree Course in Agricultural Science and Technology. 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.
Additional information	