General information's	
Academic subject	Agricultural Industries (C.I. Technologies for Agro-Food Transformations)
Degree course	Agricultural Science and Technology
ECTS credits	6 ECTS (4 ECTS of Lectures + 2 ECTS of laboratory or guided visits to Agro-Food Farms)
Compulsory attendance	No
Teaching language	Italian

Subject teacher	Name Surname	Mail address
	Giuseppe Gambacorta	giuseppe.gambacorta@uniba.it

ECTS credits details	Area	SSD	Credits
	Characterising training activity	AGR/15	6

Class schedule	
Period	Second semester
Course year	Third
Lesson delivery method	Lectures Laboratory or guided visits to Agro-Food Farms

Time management	
Hours	150
In class study hours	60
Out of class study hours	90

Academic calendar	
Class begins	March 1th, 2021
Class ends	June 11th, 2021

Syllabus	
Prerequisites	knowledge of chemistry and biochemistry.
Expected learning outcomes	*Knowledge and understanding* - Knowledge and understanding of the composition and evolution of raw materials (grapes, olives and milk). *Applying knowledge and understanding* - Ability to identify and apply with autonomy the appropriate processing technologies depending on the compositional characteristics of the raw materials. - Ability to identify and carry out technological interventions in order to obtain a healthy and stable product over time. *Making informed judgements and choices* - Ability to interpret the results of analytical controls of wines, olive oils and cheeses and to establish the most appropriate technological intervention for qualitative improvement. *Communicating knowledge and understanding* - Ability to communicate the importance of raw material quality and of the rational application of winemaking technologies in order to obtain product of quality. - Ability to describe the impact of technological variables on the quality characteristics of end products, even to an inexpert public. *Capacities to continue learning* - Ability to update and deepen the knowledge of processing

	techniques through the study of scientific publications in the field of enological, oil and dairy sectors.
Contents	**Wine sector** Chemical and biochemical constituents of grapes. The ripening of grapes and the technological role of its components. Role of sulphur dioxide in oenology. Red winemaking. White winemaking. Vinification in rosé. Vinification with carbonic maceration. Intensity and clarity of the wine. Wine stabilization. Wine defects and alterations. Principles and methodologies of common analytical procedures for wine quality control. Quality analysis of wines. **Olive oil sector** Classification of lipids. Fatty acids, triglycerides, minor saponifiable and unsaponifiable compounds. Lipid alteration: lipolysis and oxidation. Production process of virgin olive oils. Classic and innovative extraction systems. Oil rectification: degumming, deacidification, decolorization, deodorization, winterizing. Principles and methodologies of common analytical procedures for the quality control of virgin oils. Quality analysis of olive oils. **Dairy sector** The main components of milk: fat, protein and carbohydrates. The minor components of milk: vitamins, enzymes, citric acid, non-protein nitrogen, microorganisms and cellular elements. Acid and rennet coagulation. Processing of hard and pasta filata cheese. Cheese defects and alterations. Processing of ricotta, cream and butter. Drinking milk. Principles and methodologies of common analytical procedures for the quality control of milk. Quality analysis of dairy product

Course program	
Reference books	• Appunti dalle lezioni e materiale distribuito durante il corso. • Ribéreau-Gayon P., Glories Y., Maujean A., Dubourdieu D. "Trattato di enologia I" e "Trattato di enologia II". Edagricole, Bologna, 2003. • Lanati D. De Vino "Lezioni di enotecnologia". Edizioni AEB, 2007. • Capella P., Fedeli E., Bonaga G., Lerker G. "Il manuale degli oli e dei grassi". Tecniche Nuove, Milano, 1997. • Autori vari. OLEUM "Manuale dell'olio da olive". Edagricole, Bologna, 2011. • Mucchetti G., Neviani E. "Microbiologia e tecnologia lattiero-casearia. Qualità e sicurezza". Tecniche Nuove, 2006.
Notes	The texts are available at the central library of Agraria and at the study of the teacher.
Teaching methodsi	The course topics will be treated with the help of Power Point presentations, case studies discussion, exercises in the classroom and laboratory, educational visits to sensory and instrumental analysis laboratories. Lecture notes and educational supplies will be provided by means

	of a mailing list or online platforms (i.e.: Edmodo, Google Drive…)
Evaluation 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 Bachelor 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 Bachelor Degree in Agricultural Science and Technology. Non-Italian students may be examined in English language, according to the aforesaid procedures.

Evaluation criteria	• *Knowledge and understanding*
	  o Describe the components of raw materials and their evolution during processing.
	• *Applying knowledge and understanding*
	  o Describe the processes according to the raw materials and to the products required by the consumer.
	  o Describe the impact of technological variables and of treatments on the quality and health characteristics of end products.
	• *Making informed judgements and choices*
	  o Interpret the results of chemical, physical and sensory analyses of food products and propose technological solutions for quality improvement.
	• *Communicating knowledge and understanding*
	  o Illustrate the layout of processes by reporting any critical points and quality control strategies.
	  o Illustrate hypothetical processing technologies according to compositional of the raw materials.
	• *Capacities to continue learning*
	  o Ability to deepen and update independently the processing knowledge acquired.

Receiving times	Tuesday-Friday by previous agreement at the "Dipartimento di Scienze del Suolo, della Pianta e degli Alimenti (DiSSPA)".