

General Information	
Academic subject	Agri-food Industries (Technologies for Agri-food Manufacturing I.C.)
Degree course	Agricultural science and technology
Curriculum	
ECTS credits	6 (4 Lectures + 2 practicals)
Compulsory attendance	No
Language	Italian

Subject teacher	Name Surname	Mail address	SSD
	Giuseppe Gambacorta	giuseppe.gambacorta@uniba.it	AGR/15

ECTS credits details			
Basic teaching activities	6		

Class schedule	
Period	Second semester
Year	1
Type of class	Lectures Laboratory exercises Guided tours to agri-food companies

Time management	
Hours	150
In-class study hours	60 (32 Lessons + 28 practicals / agri-food companies)
Out-of-class study hours	90

Academic calendar	
Class begins	5th March, 2018
Class ends	22nd June, 2018

Syllabus	
Prerequisites/requirements	Knowledge on Chemistry and Biochemistry.
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in A4a, A4b, A4c tables of the SUA-CdS)	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Knowledge of composition and evolution of raw materials (grape, olives and milk).</li> </ul> <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Ability to identify and apply with autonomy the appropriate process technologies depending on the compositional characteristics of raw materials.</li> <li>○ Ability to identify and carry out technological interventions in order to obtain a healthy and stable product over time.</li> </ul> <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> <li>○ Ability to understand the results of analytical controls and to establish the most appropriate technological interventions for qualitative improvement.</li> </ul> <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Ability to communicate the importance of raw material</li> </ul>

	<p>quality and of the functional application of food processing in order to obtain high quality products.</p> <ul style="list-style-type: none"> <li>○ Ability to describe the impact of technological variables on the quality characteristics of final product, even to a non-specialist .</li> </ul> <p><i>Capacities to continue learning</i></p> <p>The expected results of learning, in terms of knowledge and skills, are listed in the Annex A of the Teaching Regulations of the bachelor (expressed by means of the European Descriptors of the bachelor in Agricultural Science and Technology) and are summarized as:</p> <ul style="list-style-type: none"> <li>○ Ability to update and deepen the knowledge of processing techniques through the study of scientific publications in the field of enological, oil and dairy chains.</li> </ul>
Contents	<p><u>Oenological Chain</u></p> <p>Chemical and biochemical constituents of grapes. The aging and technology role of sugars, organic acids, polyphenols, pectic substances, nitrogenous substances, enzymes, vitamins and minerals.</p> <p>Role of enzymes, yeasts and sulphur dioxide in oenology. Red winemaking. White winemaking. Rosè winemaking. Winemaking with carbonic maceration.</p> <p>Turbidity and clarification of wine. Stabilization of wines. Defects and abnormalities of wines. Special wines.</p> <p>Chemical, physical and sensorial analysis: principles and methodologies of common analytical procedures for quality control of wine.</p> <p><u>Oil Chain</u></p> <p>Lipid classification. Fatty acids, tryacylglycerols, minor and polar and not polar compounds. Lipids alteration: lipolysis and oxidation processes.</p> <p>Production process of virgin olive oil. Classic and innovative extraction systems.</p> <p>Refining processing: degumming, deacidification, bleaching, deodorization and winterization.</p> <p>Chemical, physical and sensorial analysis: principles and methodologies of common analytical procedures for quality and purity control of olive oil.</p> <p><u>Dairy Chain</u></p> <p>The main components of milk: fat, proteins and carbohydrates.</p> <p>The minor components of milk: vitamins, enzymes, organic acids, non-protein nitrogen, microorganisms and cell components.</p> <p>Acid and rennet coagulation.</p> <p>Production process of hard and filata pasta cheese. Defects and alteration of cheese. Production process of ricotta cheese, cream and butter.</p> <p>Principles and methodologies of common analytical procedures</p>

	for quality control of milk.
<b>Course program</b>	
Bibliography	<ul style="list-style-type: none"> <li>• Notes on lectures available for students.</li> <li>• Ribéreau-Gayon P., Glories Y., Maujean A., Dubourdieu D. "Trattato di enologia I" e "Trattato di enologia II". Edagricole, Bologna, 2003.</li> <li>• Lanati D. De Vino "Lezioni di enotecnologia". Edizioni AEB, 2007.</li> <li>• Capella P., Fedeli E., Bonaga G., Lerker G. "Il manuale degli oli e dei grassi". Tecniche Nuove, Milano, 1997.</li> <li>• Autori vari. OLEUM "Manuale dell'olio da olive". Edagricole, Bologna, 2011.</li> <li>• Salvadori del Prato O. "Trattato di tecnologia casearia". Calderini Edagricole, Bologna, 2001.</li> </ul>
Notes	The texts are available at Central Library of Agraria and at teacher's office.
Teaching methods	<p>Topics will be treated through:</p> <ul style="list-style-type: none"> <li>• PowerPoint presentations.</li> <li>• Practicals.</li> <li>• Guided tours to agri-food companies.</li> </ul>
Assessment methods	<p>The final exam, unique, total and collegial, for the Technologies of Agri-food Manufacturing I.C., consists of an oral test on the topics of both modules ("Agri-food Industries" and "Agri-food Microbiology"). The marks are out of 30, as defined in the Didactic regulations of the bachelor in Agricultural Science and Technology (article 9) and in the syllabus (Annex A).</p> <p>The evaluation of the student's preparation is based on established criteria, as detailed in Annex A of the Didactic regulations of the bachelor program.</p> <p>For the final exam, the oral test aims at evaluating the knowledge and skills obtained on the course of both modules. The positive outcome of the oral test will result in the final evaluation of the examination, which will be expressed as the arithmetic mean of the oral tests of the two modules.</p> <p>For students enrolled in the academic year of the course, there is an oral exemption test related to the topics of lessons and exercises conducted in the period preceding the test (about half the program). Examination for the Agri-food Industries module is overcome if the student shows at least sufficient preparation, a level of knowledge appropriate to the minimum level of requirements, sufficient mastery of acceptable subject matter and language, and ability to analyse problems and structure of the arguments and has also successfully passed the exemption test of Agri-food Microbiology. The positive outcomes of the exemption tests of both modules contribute to the evaluation of Technologies of Agri-food Manufacturing I.C. and have the validity of an academic year.</p> <p>For students eligible for exoneration, the final oral exam will only cover the topics of lessons and exercises carried out during the period following the exemption test. In this case, the assessment of the final exam is expressed as the mean between the mark of the exemption and the final tests.</p> <p>For foreign students the exam can be done in English.</p>

<p>Evaluation criteria</p>	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Knowledge on raw materials composition and their evolution during food processing.</li> </ul> <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Ability to describe food processing according to the raw materials and the final product as required by consumers.</li> <li>○ Ability to describe the impact of technological variables and treatments of qualitative and healthy characteristics of final products.</li> </ul> <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> <li>○ Understand the results of chemical-physical and sensory analyses of food products and propose technological solutions for quality improvement.</li> </ul> <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Illustrate the layout of production processes with the critical points and the control strategies.</li> <li>○ Illustrate hypothetical food processing according to the compositional characteristics of the raw material.</li> </ul> <p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> <li>○ Learning of this module occurs during lectures, laboratory exercises and guided instruction tours to agro-food companies. Knowledge learning is also verified by the case studies proposed during course.</li> </ul>
<p>Further information</p>	<p>Office hours:          Tuesday - Friday, after appointment, at the Department of Soil, Plant and Food Sciences, to be agreed by e-mail.</p>