UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

Consiglio di Interclasse L-26 e LM-70

General information		
Academic subject	***Food processing plants (I.C. Agro-food processing plants)***	
Degree course	*Food Science and Technology (L26)*	
Academic Year	*Second*	
European Credit Transfer and Accumulation System (ECTS)	6 ECTS	
Language	*Italian*	
Academic calendar (starting and ending date)	*February 27th – June 16th, 2023*	
Attendance	*No Compulsory*	

Professor/ Lecturer	
Name and Surname	Alessandro Leone
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Department and address	*DIP. DiSAAT – Università degli Studi di Bari*
Virtual headquarters	*Microsoft teams*
Tutoring (time and day)	Tuesday-Thursday 9.00-16.00

Syllabus	
Learning Objectives	*Aim of the course is to study the structural, functional and sizing of the main machinery and equipment for the food processing industry, providing guidance on the correct choice in relation to the characteristics of the company in which they must operate.*
Course prerequisites	*Basic knowledge of physics, mathematical analysis and unit operations.*
Contents	• *Introduction: the disciplines of "Food processing plants"* • *Machine, general equation and machine performance, classifications of machines (simple machines, complex machines and electric machines)* • *Force resisting* • *Mechanical and hydraulic transmissions* • *Fuel energies and general characteristics* • *Basic concepts of electrology and electric motors* • *Pumps, fans, compressors and vacuum pumps* • *Pneumatic transmission* • *Endothermic engine: (operating principle, constituent parts, Otto and Diesel thermal cycles.* • *Equipment and machines for olive oil processing* • *Equipment and machines for wine processing* • *Equipment and machines for dairy processing* *Working times. Working capacity of food industry machinery. Labour productivity.*
Books and bibliography	○ P. De Vita, G. De Vita. "Manuale di meccanica enologica". ULRICO HOEPLI MILANO (2007) ○ L. Conte, M. Servili. "Oleum. Qualità, tecnologia e sostenibilità degli oli da olive" (Edagricole-New Business Media, 2022).Alfa-Laval. "Dairy Handbook". Alfa-Laval, Food Engineering AB. P.O. Box 65, S-221 00 Lund, Sweden.
Additional materials	*Notes, slides and other bibliographic materials will be furnished during the course*

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	*Lectures will be presented through PC assisted tools (PowerPoint, video). Field and laboratory classes, reading of regulations will be experienced.* *Lecture notes and educational supplies will be provided by means of online platforms*
Expected learning outcomes	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)
Knowledge and understanding on:	○ Mastery of logical and cognitive tools to understand the main transformation processes of the food industry and the combination: production process - product quality; ○ Knowledge of the criteria for the use of machines and plants for food processing and storage.
Applying knowledge and understanding on:	○ Knowledge of the influence of the technical solutions adopted on crops and breeding on the quality of raw materials; ○ knowledge of the main dimensional, constructive and design aspects of the food industries; ○ understanding of structure-function relationships in food systems and their changes in processes; ○ risk analysis for food machines.
Soft skills	*Making informed judgements and choices* ○ Ability to correctly carry out the research for mechanical and plant solutions that are appropriate to change the characteristics and quality of foodstuffs; ○ ability to correctly guide the choice of suitable technical solutions to monitor the characteristics and quality of food products during processing; ○ ability to evaluate technical and plant choices related to the environmental sustainability of primary production, with particular reference to wastewater purification and by-products recovering. *Communicating knowledge and understanding* ○ Ability to establish a professional dialogue with other professionals and operators in the industry, with particular reference to the basic design of processing industries, the definition of production layouts, and the testing of plants. *Capacities to continue learning* ○ Ability to develop and update knowledges of machines and plants for primary products, wastewater purification, waste management and by-product recovering.
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).	

Assessment and feedback	
Methods of assessment	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's degree in food science and Technology. The foreign student's profit test can be done in English in the way described above.
Evaluation criteria	• *Knowledge and comprehension ability* o Description of the sequence of machines constituting the plants studied during the course; o Description of the layout of the purification plants studied during the course; o Description of the work of the machines studied during the course; o Description of the layouts studied during the course. • *Knowledge and applied comprehension ability* o Machine selection criteria and layout according to the examples presented as case studies; o Making of machine sizing calculations using the methods of theoretical-practical lessons and exercises. • *Autonomy of judgement* o Proposals of changes in layouts based on the quantitative, qualitative and ecological requirements of the studied transformations. • *Communication skills* o Ability to develop relationships and professional collaborations. • *Learning ability* o Ability to extend the acquired knowledge to untreated food lay out and processes.
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	