UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Promozione della Salute, Materno-Infantile, di Medicina Interna e Specialistica di Eccellenza “G. D’Alessandro”
ACADEMIC YEAR	2022/2023
BACHELOR'S DEGREE (BSC)	PREVENTION TECHNIQUES FOR THE ENVIRONMENT AND WORKPLACE
INTEGRATED COURSE	FOOD TECHNOLOGY - INTEGRATED COURSE
CODE	15176
MODULES	Yes
NUMBER OF MODULES	2
SCIENTIFIC SECTOR(S)	AGR/15, CHIM/10
HEAD PROFESSOR(S)	
OTHER PROFESSOR(S)	AVELLONE GIUSEPPE Professore Associato Univ. di PALERMO
CREDITS	6
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	3
TERM (SEMESTER)	1° semester
ATTENDANCE	Mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**AVELLONE GIUSEPPE** Tuesday 11:00 13:30 Studio del docente in via Archirafi n.32 scala A, primo piano, stanza 75SI CONSIGLIA LA PRENOTAZIONE TRAMITE MAIL:beppe.avellone@unipa.it

DOCENTE:

PREREQUISITES	Basic knowledge of chemistry, physics and mathematics.
LEARNING OUTCOMES	Knowledge and ability to understand: knowledge needed to assess the composition, nutritional value, chemical processes and technologies for the processing, involved in the preparation and storage of food as well as' the possible alterations that they may suffer; acquisition on the main categories of contaminants and food additives and regulatory contexts; in order to acquire a scientific method to ensure food safety. Knowledge is tested with an oral interview. Capacity to apply knowledge and understanding: ability to support arguments and use the acquired knowledge of food chemistry and food technology related to the most 'recent food issues and develop and apply protocols for control and food safety. Making judgments: ability to find and use data to formulate responses to theoretical issues and / or practical, ensuring a scientific approach and providing appropriate solutions. Enable communication: communicating clearly and without ambiguity' the knowledge gained with the help of multimedia tools. Sa reporting on the activities' carried out related to food science. Learning: ability learning to enable him independently to provide for the continuous updating of their knowledge or undertake more advanced studies oriented to acquire a further and more' professional development specialist.
ASSESSMENT METHODS	Oral exam: Oral examination, aimed to assess the skills and disciplinary knowledge possessed by student; the evaluation is expressed in thirtieths. The questions will be specifically designed to test the learning outcomes and to verify: a) the knowledge of topics; b) the ability to process the knowledge, c) the mastery of scientific language and presentation skills. The assessment has a final grade included in the following range: 30-30 with honours (excellent), corresponding to “excellent knowledge of topics, excellent use of language, good analytical skills, the student can implement his\her knowledge to solve the posed problems”; 26-29 (very good), corresponding to “good mastery of topics, very good use of language, the student can implement his\her knowledge in order to solve the posed problems”; 24-25 (good), corresponding to “basic knowledge of the main topics, fair use of language, with moderate capability to independently implement knowledge to solve the posed problems”; 21-23 (satisfactory), corresponding to “the student doesn't possess full mastery of the main teaching topics but s\he possesses knowledge of them, satisfactory use of language, poor ability to independently implement the acquired knowledge”; 18-20 (passing grade), corresponding to “very poor basic knowledge of main teaching topics and scarce technical language, no or very poor ability to independently implement the acquired knowledge”; unsatisfactory when the student doesn't possess an acceptable knowledge of the contents of the topics dealt during the course.
TEACHING METHODS	Lessons using power-point

MODULE
FOOD SCIENCE AND TECHNOLOGIES

SUGGESTED BIBLIOGRAPHY

Slides prodotte dal docente ed usate per lo svolgimento delle lezioni.
Regolamenti Europei.
V. Sciancalepore – Industrie Agrarie, olearia enologica lattiero-casearia. UTET ISBN-10: 8802054037
C. Lerici, G. Lerker – Principi di tecnologie alimentari. Ed. Clueb, Bologna. SBN: 8880915312
M. Melissano – Alimenti e alimentazione. Edagricole. ISBN: 8850652356

AMBIT	10733-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

The course in food science provides a theoretical preparation for an adequate knowledge of the processes and technologies for food processing, highlighting the critical issues concerning food safety, while also providing a basic knowledge on current legislation in the sector.

SYLLABUS

Hrs	Frontal teaching
2	Introduction. The unit operations.
4	The food business law: the Hygiene Package, CE Regulation n.178/2002 and CE Regulation n. 1441/2007, the CE Regulation n.1169/2011, the CE Regulation n.1935/2004.
2	The stabilization treatment of food and the shelf-life
3	The H.A.C.C.P. system and the analysis of risks in the food industry. System Application to business reality
2	Dairy industry.
2	wine industry.
2	oil industry.
2	canning industry
2	confectionery industry
3	The processing of meat for the production of sausages.
2	beer production.
2	The voluntary certification in the food industry, product standards and quality labels.

Hrs	Others
2	Educational visit

MODULE
FOOD CHEMISTRY

Prof. GIUSEPPE AVELLONE

SUGGESTED BIBLIOGRAPHY

Dispense rilasciate dal Docente.
L Mannina, M.Daglia, A Ritieni "La chimica e gli alimenti. Nutrienti e aspetti nutraceutici" CEA
P. Cappelli, V. Vannucchi. “Chimica degli alimenti”. Ed. Zanichelli; Bologna.

AMBIT	10733-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

Provide a theoretical preparation for adequate knowledge: the composition and chemical characteristics of food, chemical processes involved in the preparation and preservation, the main categories of contaminants and food additives and legislative frameworks related to them; in order to acquire a scientific criterion to the issues of food security sector.

SYLLABUS

Hrs	Frontal teaching
1	Introduction. Articulation and objectives of the course. Review of the main constituents of food substances: water, lipids, carbohydrates, proteins, salts, vitamins.
2	Drinking water: Water cycle, classification of natural waters, potability parameters; sampling, analysis; hardness, fixed residue, dissolved ions and gases, conductivity, BOD, COD; correction and purification. mineral waters.
1	Minerals: Macroelements and essential trace elements in human nutrition. Vitamins: Water-soluble and fat-soluble
4	Lipids: Chemical composition of oils and fats; classification of fats. saponifiable saponifiable, glycerides, phosphoglycerides, steridi. Assays and analytical determinations: density, acid number, saponification number, number of peroxides, water in fats.
4	Carbohydrates: mono, oligo and polysaccharides; stereochemistry of saccharides; main mono and disaccharides. Starch. and cellulose. dietary fiber.
4	Proteins: Amino acids: amphoteric character, isoelectric point, classification. peptide bond. Protein, primary, secondary, tertiary, quaternary. Essays on proteins: reaction of biuret with Ninhydrin, protein nitrogen with the Kjeldahl method, electrophoresis, LC-MS.
4	Milk and dairy products. Milk composition, general characteristics; alterations; conservation treatments; adulteration. skimmed milk, concentrated, powdered; fermented milks. Controls and analysis on milk. Butter: production, composition, adulteration; essays and analysis. Cheeses: raw materials, the cheese-making processes, production techniques, classification. Sampling, measurements and analyses on cheese.
2	Oils: Olive oil, production; classification; pomace oil, correction and analysis of olive oils, UV spectra, looking for dienes and polyphenols. Seed oils: extraction and purification processes ;. Hydrogenation of fats, margarines.
3	Beverages: Alcoholic and non-alcoholic: classification and characteristics. Wine: grapes, grape must, fermentation in white and red. Essays and analysis of musts and wines, sugar and alcohol content, dry extract, ash, total and reducing sugars; liqueur wines and flavored .. Brandy, liqueurs and other alcoholic beverages. Beer production process, malting, fermentation, flavoring.
2	Food preservation: technologies and industrial processes of conservation and processing of foods. Techniques for packaging and shipping. Conservation with heat, canned goods, canning. Preservation with cold, freezing, deep freezing. Modified atmosphere packaging and vacuum. Conservation for removal of water: concentration, freeze-concentration, drying, lyophilization. Salting, smoking.
1	Food Additives: Use of additives in modern. Preservatives, antioxidants, thickeners, emulsifiers, flavorings, colorings, sweeteners.
1	Contamination and alteration of foods: chemical contamination: as pesticides, for sale by containers, heavy metals, radionuclides. Contamination and biological alterations: bacterial contamination sources, consequences and preventive measures.
1	Novel Food legislation and analysis