

TEACHING UNIT OF 'FOOD TECHNOLOGY'

BA course in Hospitality Management

Teaching unit

Undergraduate A.A. 2020/2021

Professor: Raffaele Sacchi

☎ 081-2539320, 340-2916999

email: sacchi@unina.it

SSD CFU Year (I, II o III)

Semester (I o II)

Eventual pre-requisite (specify the teaching unit): none

Lessons timetable (to click on)

LEARNING OUTCOMES

Knowledge and understanding

The course aims to provide general principles and basic knowledge on: i) chemical composition of foods, ii) production and processing technologies, iii) sensory and nutritional properties of fresh, preserved and cooked foods, iv) conservation of materials raw materials, food ingredients and semi-finished products, v) quality control of fresh, processed, cooked and preserved foods.

Applying knowledge and understanding

At the end of the course, the aim is to provide the student with the knowledge necessary for the development and management of a quality system in the food sector, to be applied to a hotel / restaurant business. In particular, starting from the basic rules for the safety, management of the conservation, transformation and administration of fresh, cooked and processed foods, the aim will be to transfer to the students skills on the quality and on the identification of the strengths and weaknesses of the food offer in a hypothetical hotel catering point.

Any other learning outcomes, considering:

i) awareness of the territorial identity of typical regional products and link with the Mediterranean Diet, ii) ability to consider the quality of food and its history as a tool for enhancing the offer, iii) knowledge of chemical-compositional aspects and quality sensory of the identity products of Campania and Italian gastronomy.

SYLLABUS

1. Introduction and course objectives: 2. Mediterranean diet, HM and F&B. 3. Concepts of Quality, Quality Control and Quality Systems. Food legislation and certifications (individual Project Work). 4. Definitions of agricultural production, agro-industry (first transformation) and food industry (second transformation). 5. Review of food chemistry: acid / base reactions, organic compounds (sugars, proteins and lipids), esterification and hydrolysis, peptide bond, glycosidic bond, simple sugars (glucose, fructose, lactose, sucrose) and complexes (starch and cellulose), pectins and dietary fiber, lipid oxidation, lipolysis and proteolysis. Carbon, hybrid orbitals, double bond and phenolic antioxidants, nomenclature, structure and physical properties of the main fatty acids (PA, SA, OA, LA, LnA, ALnA, ARA, EPA, DHA) and their chemical properties (mechanism of formation of peroxides, their decomposition and formation of volatile substances, oxidative rancidity). 6. Elements of food biochemistry (enzymes, glycolysis, alcoholic and malo-lactic fermentation, acetification, lactic fermentation, via the lipoxygenases and aromas). 7. Chemical composition and technology of foodstuffs (outline), influence of the quality of raw materials of animal and vegetable origin and of processing technologies on the quality of agri-food products (virgin olive oils, wine and vinegar, beer, dairy products fresh and aged: edible milk, buffalo mozzarella, ricotta, caciocavallo, caciocotta, butter, innovative products: the example of buffalo 'lattecotto'), vegetable oils, margarines, meats, fish, tomatoes, cereals, brassicas, fruit, canned food, baked goods, Neapolitan bread and pizza, table olives, capers, walnuts and hazelnuts, salted anchovies and anchovy colatura, tuna in oil. 8. Notes on some unitary operations of food technologies (centrifugation and Stokes's law, filtration and Darcy equation, drying, homogenization, heat treatments). 9. Processes of transformation of agro-food products: 9.1. Oil mill: olives, composition and histology of the drupe, defoliation, washing, pressing / milling, kneading, centrifugal extraction by decanter, centrifugal clarification, storage, decanting and filtration, bottling and packaging, the biophenols of virgin olive oil and their O / W breakdown, the sensory and nutritional quality of extra virgin olive oil. 9.2. Oenology (notes, individual PW), 9.3. Dairy (outline), 9.4. Pasta factory, 9.5. Vegetable preserves, 9.6. Meat and fish products (in-depth seminar). 10. The survey of a production process and its spatial-temporal representation (lay-out and flow-chart) for the purpose of implementing a quality system. 11. The chemical and physico-chemical phenomena of food degradation: 11.1 Lipid autoxidation, photo-oxidation and thermo-oxidation. 11.2 Enzymatic oxidation (POO) of plant tissues, lipolysis and proteolysis in meats and cheeses, alcoholic fermentation of sugars, respiration of fruits, maturation of meats (individual PW). 12. Conservation technologies (drying, salting, heat treatments, refrigeration); meat and fish products and their conservation, conservation of fresh and processed vegetables (tomato preserves, etc.) (individual PW). 13. Quality systems in the food industry and in the refreshment points (HM):

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technological check-up (verification of the lay-out, production diagram, machines and systems, personnel training, roles and skills, product quality, management of by-products and wastewater, quality control), hints on the implementation of a quality system, customer satisfaction in catering and HM (breakfast). 14. Notes on food microbiology: microbial metabolism, fermentations and fermented products (wine, beer, cheese, yogurt, etc.). Hints on the development of HACCP plans in HM. 15. Packaging, distribution, shelf-life and food preservation. Storage and management of food in HM (individual PW). 16. Mediterranean gastronomy: typical products, the molecular keys for the decoding of traditional and innovative preparations of Mediterranean gastronomy (individual PW). Notes on food and wine communication. Sustainability and reduction of food waste (individual PW). 17. Notes on food design and process / product innovations. Functional Foods and Novel foods (individual PW). 18. Group work: intermediate summary analyzes. 19. Individual project works to be presented at the end of the course (format, topics and contents will be defined under the supervision of the teacher). 20. Group exercises (not carried out in 2020 due to the pandemic): survey of a production cycle and analysis of criticalities and strengths; practical exercises on sensory quality and food labeling; technical visits to food industries (oil mill, cellar, dairy, canning industries, dried fruit, pasta factory, others) and to the chemical and sensory analysis laboratories of the Department of Agricultural Sciences.

REFERENCE BOOKS AND ARTICLES

Notes, materials and original presentations (slides), in-depth texts (pdf), will be provided by the teacher; course lecture recordings will be also available at the end of the course for all students.

ASSESSMENT METHODS AND CRITERIA

The truthfulness of the learning will aim at verifying the level of knowledge acquired on:

- chemical composition of food,
- production and processing technologies,
- sensory and nutritional properties of fresh, preserved and cooked foods,
- conservation of raw materials, food ingredients and semi-finished products,
- quality control of fresh, processed, cooked and preserved foods.

EXAM'S STRUCTURE

The final exam is based on	Written and oral	Only written	Only oral	20
Project work and relative discussion				10
Other (specify)				-

In case of written exam	Multiple choice	Open ended (no more than one page)	Numerical exercises
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Oral exam (evaluation 20/30, 70%)	
<i>Average number of questions for the oral exam</i>	3
<i>Average time for the oral exam</i>	30 minutes
Evaluation	The oral exam will be assessed on the basis of the accuracy of the answer, the clarity of the presentation and the ability to make connections

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Project work (evaluation 10/30, 30%)	
Evaluation of the project work	The ability to summarize, the completeness and the relevance of the discussion will be evaluated

NOTES

It was not possible to carry out the planned group exercises (survey of production cycles, analysis of criticalities and strengths, practical exercises on sensory quality and food labeling, technical visits in food industries and in the chemical and sensorial laboratories of the Department of Agriculture) in the period November-December 2020 due to the COVID-19 pandemic. This will be taken into account in the exam evaluation.