# .- FOOD TECHNOLOGY

## Prof. Giorgia Spigno

## ***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

 The aim of this course is to provide basic knowledge of principles of food processing and related technologies, covering general characteristics of raw food materials, principles of food preservation, processing factors that influence quality, packaging, process management and sustainability.

At the end of the course, the student will have acquired the basic knowledge about the importance, implementation and control of thermal treatments with an overview on the most current non-conventional technologies. The student will also have learnt about the importance of the water content and water activity in the food product stability and the related concentration and drying technologies and plants. The student will also learn basic driving factors in the packaging sector and in the industrial approach for a sustainable development.

The acquired knowledge will allow the student to: carry out basic mass and energy balances for the design and management of a food process; recognise the basic equipment used in food processing with reference also to recent innovation trends; understand the role of food processing in the sustainability of the agri-food systems.

***COURSE CONTENT***

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|  | CFU |
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| Introduction to food technologies and food processing. Mass and energy balances. | 1.00 |
| Food thermal treatments (principles and plants for conventional pasteurization, blanching, commercial sterilization with basic indications to non-conventional thermal technologies). Low temperature storage (freezing and refrigeration).  | 1.00 |
| Processes for the reduction of water content in foods (drying and concentration technologies (process variables, plants and applications)  | 0.5 |
| Non-thermal preservation techniques. | 0.5 |
| Overview on shelf-life, storage and packaging aspects. | 0.5 |
| Principles of sustainability in food processing. | 0.5 |
| **Tutorials** | 1.0 |
| Problems solving in relation to mass and energy balances and thermal treatments. Possibly seminars with industry representatives and visits to food companies for case-study reporting and discussion. |  |

***READING LIST***

R.P. Singh, D.R. Heldman, *Introduction to Food Engineering. Fourth Edition*. Academic Press, Burlington USA, 2009.

H. Ramaswamy, M. Marcotte, *Food Processing. Principles and Applications,* Taylor& Francis Group, New York, 2006.

***TEACHING METHOD***

1. Theoretical classes with stimulated participation by the students to present the basic concepts of the course.
2. Practical classes with assisted solving of numerical problems representing the application of mass and energy balances and thermal treatments in the food processes.
3. Possibly one visit to a food company.
4. Possibly seminars with industry representatives for case-study reporting and discussion.

***ASSESSMENT METHOD AND CRITERIA***

Final written exam. Students will be given 2 h time to solve numerical exercises (on energy and mass balances and on thermal treatments) and answer to open and closed theoretical questions on the program. On average 2 exercises (maximum 12 points), 3 open questions (maximum 18 points) will be provided (no answer gives no point, while wrong answers may give penalisations). Evaluation of the answers to the open questions will take into account the use of appropriate technical / scientific terms and the capacity of elaborating the received concepts.

***NOTES AND PREREQUISITES***

The course requires basic knowledge in physics and math.

Prof. Spigno teacher receives students at the DiSTAS – Section of Food Technologies, Enology and Environment, preferably by appointment (giorgia.spigno@unicatt.it).

Further information can be found on the Faculty notice board.

# Food Technology – Mod. Sensory Analysis

## Prof. Gianluca Donadini

***COURSE AIMS AND EXPECTED LEARNING SKILLS***

The course aims at providing the students with the necessary knowledge and skills to perform Sensory Analysis, both as a judge and as a panel leader. The physiological, psychological, technological and methodological aspects of Sensory Analysis will be discussed and applied to a series of targeted foods and beverages.

At the end of the course students are expected to correctly translate an issue about sensory aspects into an experimental plan, by choosing a suitable methodology, carrying it out rigorously, processing and interpreting the results. Students are also expected to critically read a Sensory Analysis report and judge of its validity.

***COURSE CONTENT AND STRUCTURE***

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| --- | --- |
|  | CFU |
| **Fundamentals of sensory analysis** |  |
| Psychophysiology of perception: the sensory system involved in food analysis. | 1.0 |
| Methodology of sensory analysis. Panel training and management of a sensory system.  | 1.0 |
| Practical experience  | 0.5 |
| **Tests and schedules** |  |
| Laboratory tests: descriptive and discrimination methods. Consumer tests. Experimental planning and statistical processing for sensory analysis.  | 1.0 |
| Practical experience  | 0.5 |

***READING LIST***

Odello L., Violoni M. *Sensory analysis. The psychophysiology of perception,* Centro Studi Assaggiatori, Brescia 2017

H.T. Lawless, H. Heymann, Sensory evaluation of food: principles & practices, Chapman & Hall, New York, NY, 2010

H. Stone, J.L. Sidel, Sensory Evaluation Practices, 3rd ed. Academic Press, S. Diego, CA, 2004

M.C. Meilgaard-G.V. Civille-B.T. Carr*, Sensory Evaluation Techniques*, CRC Press, Taylor & Francis Group, 2006.

Scholarly articles

***TEACHING METHOD***

1. Theoretical classes with stimulated participation by the students to present the basic concepts of the course.
2. Application of the methodology to a series of foods and beverages, in assisted teamwork.
3. Connection between practices on foods and beverages and lessons on sensory analysis fundamentals and methodology, which ideally include introduction and explanation before the practical work and its commentary and analysis thereafter.

***ASSESSMENT METHOD AND CRITERIA***

Final written exam. Students will be given 2 h time to answer:

* a multiple-choice test to verify the acquisition of both theoretical knowledge and methodological skills (20 points. No answer gives no point, as well as wrong answers)
* a sensory issue by describing the approach to be chosen to solve it (5 points)
* a critical analysis of a sensory report, by listing correct points of the methodology, mistakes and possible corrections (5 points).

Evaluation of the answers to the open questions will take into account the correct understanding of the methodology, the use of appropriate definitions and the richness in the proposed solutions.

***NOTES AND PRE-REQUISITES***

Basic notions about statistics and some spreadsheet practice (e.g. Excel) will be helpful.

Prof. Donadini receives students after class at the Department for Sustainable Food Processes (DiSTAS) and/or by e-mail appointment (gianluca.donadini@unicatt.it).