



Course Unit: **935028 – Vegetable and Fruit Processing Technology**

Year 3 Semester 5 ISCED Code: 0721 ECTS: 5,5

Type of Course Unit: Compulsory Delivery Mode: Face-to-face Language of Instruction: Portuguese

COURSE COORDINATOR: Carlos Manuel Marques Ribeiro

HOURS OF WORK

TOTAL HOURS	Contact Hours								Hours in autonomous work
	Theory	Theory and practice	Practical and laboratory work	Field work	Seminar	Internship	Tutorial guidance	Other	
137,5	15		45						77,5

Prerequisites (if applicable): <<Max 500 characters with spaces>>

LEARNING OUTCOMES (knowledge, skills and competence)

Knowledge of vegetable and fruit properties important for their quality and preservation. Mastering the handling, preservation and processing fruit and vegetable technologies. Ability to implement, modify and manage lines and facilities of treatment, storage and processing of fruit and vegetables. Development of products based on fruits and vegetables. Capacity to apply analytical techniques for quality evaluation fruits and vegetables and their products. Skills in the handling of by-products and residues..

CONTENTS

1. Market, production and consumption of fruits and vegetables.
2. Chemical composition and structure of fruits and vegetables.
3. Biochemical phenomena associated with the maturation and postharvest.
4. Minimal processed products.
5. Preservation by chilling and controlled atmosphere.
6. Processed products. Raw materials and finished products quality. Production diagrams. Equipment and facilities. Fermented, frozen and thermally processed products. Table olives. Tomato, pepper, beans, peas and fruits preserves. Fruit juices and beverages, pulps and concentrates. Jams and jellies. Dehydration of fruits and vegetables.

DEMONSTRATION OF THE CONTENTS COHERENCE WITH THE COURSE UNIT'S LEARNING OUTCOMES

The study of the chemical composition and structure of fruits and vegetables, as well as the biochemical and postharvest microbiological phenomena, will enable the development of a deep understanding and sensibility about the fruit and vegetable properties as well as of other influential factors into their quality, either as fresh products or as raw materials for processing.

In order to give the student the ability to implement and to manage lines of treatment, storage and processing of fruits and vegetables, as well as to assess their quality, a set of products will be studied, and to each of these it will be given prominence to standards of quality, operations and equipment, and will be performed by students the necessary analytical techniques.

TEACHING METHODOLOGIES

The lessons of the course will be taught in blocks of theoretical lectures and practical classes. In the lectures, theoretical concepts and case studies will be presented and discussed with students. The practical classes will consist in laboratory and pilot plant ones, in which students, individually or in groups, will execute analytical techniques and test the production of various products, and also of study visits to treatment, storage and processing facilities of fruits and vegetables .

DEMONSTRATION OF THE COHERENCE BETWEEN THE TEACHING METHODOLOGIES AND THE LEARNING OUTCOMES

The study of chemical composition and structure of fruits and vegetables, and as well of postharvest biochemical, microbiological phenomena will allow the development of a deep understanding and sensibility on the fruits and vegetables' most important properties and other factors influents on their quality, such as fresh produce or as raw materials for processing. In order to impart student with the ability to implement and to manage treatment, storage and fruit and vegetable processing lines, and also to implement and execute procedures of quality control, assurance and evaluation, a group of products will be studied, and in each of these it will be given relevance to quality standards on products destined to market; the analysis of these standards will allow the critical knowledge of what characteristics products must have to be placed on market, such as, among others, physical, chemical, dimensional, sensory, safety, and environmental requisites; handling, storage and processing operations, and selection and lay out of equipment of several types; alert to the importance of other ingredients (such as salt, sugar, pectins, etc) and materials (packaging); alert to the importance of water and its quality, not only as an ingredient, but as well as an agent present in a lot of operations of treatment and processing; alert to the need of supply assurance of raw materials, often of seasonal character; planning, implementation and execution of analytical techniques to evaluate the quality of raw materials, several other ingredients and finished products. From the conjunction of all these points, approached in a multidisciplinary mode, the student in the end must be able to develop new products, establish their specifications and implement their production according to market quality criteria and production volume.

EVALUATION METHODS

Individual written tests, reports on the practical works done in practical classes and discussion of these reports. The final grade will result from the average of the marks obtained in these evaluation elements, taking the written tests equal weight to other elements of assessment.

MAIN BIBLIOGRAPHY

- Ashurst (2005). Chemistry and technology of soft drinks and fruit juices. BlackwellPublishing Ltd.
- Chakraverty A and Singh RP (2014). Postharvest Technology and Food Process Engineering. CRC Press. Boca Raton.
- Downing DL (1996). A complete course in canning and related processes. Thirteenth Edition. Book I, II and III. Woodhead Publishing, Limited.
- Kailis S and Harris D (2007). Producing Olive Tables. Landlinks Press.
- Hui YH (2006). Handbook of fruits and fruit processing. Blackwell Publishing, Oxford, UK.
- Lozano JE (2006). Fruit manufacturing. Springer Science+Business Media, LLC.
- Martín-Belloso O and Soliva-Fortuny R (2011). Advances in fres-cut frutis and vegetables processing. CRC Press, Boca Raton.
- Paliyath G, Murr D, Handa AK and Lurie S (2008). Postharvest Biology and Technology of Fruits, Vegetables, and Flowers.Wiley-Blackwell Publishing.
- Sinha NK (2011). Handbook of vegetables and vegetable processing.Wiley-Blackwell.
- Thompson AK (2010). Controlled atmosphere stora

Year of implementation: 2018/2019 | Date of approval by the Technical-Scientific Board: