

## Course Unit: 935030 - Olive oil and vegetable oils technology

Year 3 Semester 5 ISCED Code: 721 ECTS: 5.5

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

COURSE COORDINATOR: Isabel Maria Pereira Caldas Baer

### 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): Not applicable.

### LEARNING OUTCOMES (knowledge, skills and competence)

Understand the importance of the products and industries studied in the domestic and global market and in the mediterranean and the rest of the world consumers. Encourage innovation and creativity in developing of new products. Give the students the knowledge and tools needed to work across the row of virgin olive oil extraction industries and vegetable oils industry, since the correct selection of the raw material, through the main methods and existing extraction equipment, to the utilization of by-products and quality control at all stages of the process, to the obtention, storage, packaging, preservation and marketing of the final product.

### CONTENTS

Lipid biosynthesis; classification; saturated and unsaturated fatty acids, triglycerides. Degradation of fats.

Olive oil: Olive oil formation in the fruit, maturation of the olives; quality control in reception at the olive mill. Main technologies of extraction of virgin olive oil: pressing, centrifugation percolation; equipment; advantages and disadvantages. Byproducts and effluents: uses and treatments. Extraction of oil from olive pomace. The olive oil world market: imports, exports and consumption. The different consumer products: olive oil, virgin olive oil, extra virgin olive oil, DOP olive oil, organic olive oil. The olive oil and health. Determination of the quality of virgin olive oil: sensory analysis - main positive attributes and defects; laboratory analyzes - acidity, peroxide value, UV absorbance, polyphenols, colour. Genuinity analysis.

Vegetable oils: main extraction methods; rich and poor oil seeds. Oil refining: main steps.

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

In this unit students will attend curricular lectures that will give theoretical knowledge of chemistry and biochemistry to understand the evolution of raw materials and thus understand and decide on the pretended final products and give the necessary tools to work in the industry of virgin olive oil extraction and vegetable oils extraction, controlling the whole technological process, since the reception of raw material to the storage and packaging of the final product. It also gives the students a new perspective of market trends and product innovation. The students also attend laboratory classes to perform the physico-chemical analyzes needed to assess the quality of a virgin olive oil, and contact with the major positive and negative attributes necessary for sensory analysis of virgin olive oil.

### TEACHING METHODOLOGIES

The methodologies consist of lectures, laboratory practices, powerpoint presentations and film screenings related to the themes. Conducting study visits for practical perception of all processes: to an olive plantation for monitoring of the olive ripening and harvesting of olives, to a virgin olive oil extraction industry for monitoring all stages of extraction, to a pomace oil extraction unit and to an industry of extraction and refining of vegetable oils.

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

The student will be able to work in the olive oil extraction industry and in the vegetable oils extraction and refining industries, controlling the whole technological process from reception of raw materials to the storage and packaging of the final products. They will be also capable to produce batches of olive oil according to their chemical and organoleptic characteristics and to control the quality of both the raw material (oil seeds and olive fruits) and the final product (virgin olive oil, olive-pomace oil and vegetable oils). They obtain knowledge that allow forward the sub-products and effluents for possible recovery or treatment. The completion of study visits for the entire row, during the annual period of operation of the various products, enables the student to acquire the practical perception of the most important aspects of working in the studied industries.

## **EVALUATION METHODS**

The students evaluation consists of making two written tests(60%) and a research work carried out in groups on various topics covered in the course, to develop outside of school (40%).

## **MAIN BIBLIOGRAPHY**

- Ayton, J., Haigh, T., Tronson, D. & Mailor, R. 2005. The effect of harvest timing on olive oil quality. Centre for horticulture and plant science. Hawkesbury Campus, Sidney, NSW.
- Costa, Bento et al (2002) – Código de boas práticas para o processamento tecnológico dos azeites virgens. Casa do Azeite – Associação do azeite de Portugal;
- Curci, Vincenzo (2001) – Manuale dell'olio d'oliva. Calderini edagricole
- Gunstone F (2002) - Vegetable oils in food Technology: composition, properties and uses. Publishing Blackwell
- Langstaff S & Monteleone E (2014) - Olive Oil Sensory Science. Publishing Wiley Blackwell.
- Yorulmaz A, Erinc H & Tekin A (2013) - Changes in Olive and Olive Oil Characteristics. Journal of American Oil Chemistry Society, 90: 647 – 658.

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