

## Course Unit: 935036 - Valorization of by-products

Year 3 Semester 6 ISCED Code: 721 ECTS: 3

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

COURSE COORDINATOR: Antónia Teresa Zorro Nobre Macedo

### 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	
75		36							39

Prerequisites (if applicable): Not applicable.

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

- Learn about the main by-products resulting from the food industry, as well as the spectrum of potential products which can be obtained from them.
- Learn about the main recovery processes of food by-products, whether animal or vegetable
- Learn to select recovery processes of lower costs and energy consumption, regarding an improvement of sustainability.

### CONTENTS

1. Food processing industries and state-of-the-art in the processing of by-products.
2. The principles of waste recycling.
3. Recovery of food by-products of vegetable origin: cereals, oilseeds, fruits and vegetables, bakery products and confectionery, beverages.
4. Recovery of food by-products of animal origin: dairy, meat, poultry, eggs and seafood.
5. Need for valorization of by-products and food residues: environmental concerns and regulatory aspects.

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

One brief study of the main operations of food processing will allow the student to stay abreast of the major by-products resulting from industrial processing of products of vegetable or animal origin, that are recoverable.

A thorough understanding of the technologies currently used for valuation of by-products and residues, based on aspects technical / scientific, environmental and economic impacts, will prepare the students to be able to choose between alternative processes, appropriately explaining their selection.

### TEACHING METHODOLOGIES

- Expositive approach of fundamental theoretical concepts.
- Study of practical applications and online searches.

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

The expositive approach will, for a faster way, to familiarize students with the concepts involved in the recovery of by-products. The presentation of practical examples allow them to know the advantages and disadvantages of the

technologies studied, whether environmentally or economically.

## **EVALUATION METHODS**

Evaluation involves the realization of a written work (50%) and an oral presentation, with discussion (50%).

Admission to the examination implies the presence in 3/4 of the practical classes, according to the Internal Rules.

## **MAIN BIBLIOGRAPHY**

M. Chandrasekaran (2012), Valorization of Food Processing By-Products, Series: Fermented foods and beverage series, CRC Press, India.

Lijun Wang (2008), Energy Efficiency and Management in Food Processing Facilities, CRC Press, Greensboro, USA.

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