

|                  |                               |               |                |                       |       |
|------------------|-------------------------------|---------------|----------------|-----------------------|-------|
| Course Unit      | Option I                      |               | Field of study | -                     |       |
| Master in        | Technology and Animal Science |               | School         | School of Agriculture |       |
| Academic Year    | 2015/2016                     | Year of study | 1              | Level                 | 2-1   |
| Type             | Semestral                     | Semester      | 1              | ECTS credits          | 6.0   |
| Code             | 5026-453-1105-04-15           |               |                |                       |       |
| Workload (hours) | 162                           | Contact hours | T 30           | TP -                  | PL 24 |
|                  |                               |               | TC -           | S 6                   | E -   |
|                  |                               |               | OT 20          | O -                   |       |

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) **Clementina Maria Moreira dos Santos**

#### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Know the main used types of packing in food industry, the materials of that are constituted and its main applications
2. Methods for food storage. Food transportation.
3. Know the importance of packaging recycling.

#### Prerequisites

Before the course unit the learner is expected to be able to:

The students will have to possess knowledge in mathematics, chemistry and physics.

#### Course contents

Main types of packaging: basic concepts, definitions and classification. Functions of the packaging. Types of wraps. Labels. Glass packaging. Metallic packaging. Paper packaging. Plastic packaging. Packaging/food Interactions. Storage of food products. Transport of food products. Recycling.

#### Course contents (extended version)

1. I PART- PRINCIPLES OF THE FOOD PACKAGING. Basic concepts. Classification. Functions.
2. Labels. Types of wraps. Glass packaging. Metallic packaging.
3. Paper packaging. Plastic packaging
4. Packaging/food interactions: migration; permeability of gases and water vapor.
5. II PART - STORAGE OF FOOD PRODUCTS. Influence of the storage and variability conditions.
6. Modified atmosphere, controlled atmosphere, vacuum packaging, active packaging.
7. Modified humidity packaging. Irradiation for food preservation.
8. Packaging, storage and transportation conditions for meat.
9. Packaging, storage and transportation conditions for fish.
10. Packaging, storage and transportation conditions for fresh products
11. Packaging, storage and transportation conditions cereals
12. Recycling

#### Recommended reading

1. A. Gomes de Castro e A. S. Pouzada, 1991, As Embalagens Para a Indústria Alimentar, INTELECTO, Gondomar.
2. G. W. Gould, 1995, New Methods of Food Preservation, 1st Ed. , Chapman & Hall (Blackie Academic & Professional), Londres.
3. W. A. Jenkins & J. Harrington, 1991, Packaging Foods with Plastics, Technomic Publishing Company, Inc. Lancaster, Pensilvânia.
4. M. Mathlouthi, 1986, Food Packaging and Preservation: theory and practice, Elsevier Applied Science Publishers Ltd. , Londres.
5. F. A. Page & H. Page, 1983, A Handbook of Food Packaging, Leonard Hill, Blackie & Son Ltd. , Londres.

#### Teaching and learning methods

Theoretical lessons in equipped classrooms with audiovisuals resources, such as acetate projector or datashow; Practical lessons with resolution of exercises approaching the contents presented in theoretical lessons and also executing works in adjusted installations, appealing to its equipment, using the expositive and demonstrative methods .

#### Assessment methods

- Alternative 1 - (Regular, Student Worker) (Final, Supplementary, Special)
- Reports and Guides - 33% (Laboratorial reports, research work and performance in the assisted classes - 2 ECTS.)
- Final Written Exam - 67% (Final theoretical-practical exam - 4 ECTS.)

#### Language of instruction

Portuguese

#### Electronic validation

|                                     |                          |                                   |
|-------------------------------------|--------------------------|-----------------------------------|
| Clementina Maria Moreira dos Santos | Luis Manuel Cunha Santos | José Carlos Batista Couto Barbosa |
| 15-12-2015                          | 17-12-2015               | 17-12-2015                        |