

## Course guide

### 390348 - PL - Postharvest and Logistics

Last modified: 19/06/2024

**Unit in charge:** Barcelona School of Agri-Food and Biosystems Engineering  
**Teaching unit:** 745 - DEAB - Department of Agri-Food Engineering and Biotechnology.

**Degree:** BACHELOR'S DEGREE IN AGRICULTURAL ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN AGRICULTURAL, ENVIRONMENTAL AND LANDSCAPE ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN AGRONOMIC SCIENCE ENGINEERING (Syllabus 2018). (Optional subject).

**Academic year:** 2024 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

#### LECTURER

**Coordinating lecturer:** Elena Sánchez Sánchez

**Others:** Elena Sánchez Sánchez

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

**Specific:**

CE-CA-20HJ. (ENG) Tecnología de la producción Hortofrutícola. Bases y tecnología de la propagación hortícola, frutícola y ornamental. Control de la calidad de productos hortofrutícolas. Comercialización. Genética y mejora vegetal

**Transversal:**

CT2. SUSTAINABILITY AND SOCIAL COMMITMENT: Being aware of and understanding the complexity of the economic and social phenomena typical of a welfare society, and being able to relate social welfare to globalisation and sustainability and to use technique, technology, economics and sustainability in a balanced and compatible manner.

#### TEACHING METHODOLOGY

#### LEARNING OBJECTIVES OF THE SUBJECT

The subject of postharvest and logistics, aims to know the vegetables supply chain from its collection to consumption and have options in order to maintain commercial and organoleptic quality of fresh products throughout the agri-food chain and know other options in the food industry that allow to add value to production and surpluses. It is necessary to acquire a knowledge of the post-harvest technologies that aim to prevent the deterioration of fruit and vegetable products, and reduce or slow down the metabolic rate of products and maintain their organoleptic qualities. Consequently, it is necessary to know the technologies such as modified atmosphere cooling, treatment of elimination generation of ethylene and different decontamination strategies.

It is also a goal to acquire basic knowledge of fourth, fifth range and other small transformations as resources to increase the opportunities of the fruit and vegetable company.

#### STUDY LOAD

| Type              | Hours | Percentage |
|-------------------|-------|------------|
| Hours small group | 20,0  | 13.33      |
| Hours large group | 40,0  | 26.67      |
| Self study        | 90,0  | 60.00      |

**Total learning time:** 150 h

## CONTENTS

### Introduction. Post-harvest life of horticultural products, problems and opportunities

**Description:**

Introduction: Nutritional importance of fresh vegetable products in the world setting. Problem of waste and waste of fruits and vegetables throughout the food chain

**Specific objectives:**

Acquire knowledge of the volumes of fruit and vegetable production that must be preserved from deterioration either by maintaining its freshness or to be transformed. It is necessary to become aware that in addition to having a good programming of the crops and obtaining a good quality it is necessary to watch to reduce the foodwaste in postharvest and to be more sustainable.

**Related activities:**

Activity 1

Activity 2

Activity 3

Activity 4: Visit the food bank

**Full-or-part-time:** 8h

Theory classes: 4h

Practical classes: 4h

### Technology of the frigoconservation

**Description:**

Production harvest and entry to hortofruticulture plant

Cold technology

Cameras with modification of the atmosphere

Damages and diseases that appear throughout post-harvest

**Specific objectives:**

Know the technology to manage fruit and vegetable production for a proper conservation of the product in a natural or fresh state. Avoid reducing the nutritional and visual quality of the collected products. Damages produced throughout the process and post-harvest diseases

**Related activities:**

Activity 1

Activity 2

Activity 3

Activity4: Visit to Fruit Centre -IRTA (Lléida)

**Full-or-part-time:** 16h

Theory classes: 10h

Laboratory classes: 6h

#### title english

**Description:**

Thermal treatments:

- Freezing. Frozen processing lines. Legislation, specific machinery and process control

-Pasteurization and sterilization: lines of processing of canned and fifth range. Specific machinery.

Application of modified atmospheres and other techniques: fourth range

Dessication and lyophilization. Lines for the elaboration of dehydrated and lyophilized products (vegetables and fruits). Legislation, specific machinery and process control.

Other lines of elaboration of products: fried (vegetables), pickles, fermented and confit products.

**Specific objectives:**

86/5000

Know the different techniques to keep the product fresh or transform it

**Related activities:**

Activity 1

Activity 2

Activity 3

Activity 4: Visit some industry of transformation near the area of Barcelona.

Activity 5: Elaboration of some food industry product using ESAB field production

**Related competencies :**

CE-CA-20HJ. (ENG) Tecnología de la producción Hortofrutícola. Bases y tecnología de la propagación hortícola, frutícola y ornamental. Control de la calidad de productos hortofrutícolas. Comercialización. Genética y mejora vegetal

**Full-or-part-time:** 23h

Theory classes: 16h

Laboratory classes: 7h

#### Packaging, transport and traceability

**Description:**

Packaging (to avoid misbranding and adulteration of the food product)

Labeling (to assure the consumer is informed and the food product is not misbranded)

Sanitary transportation (to avoid adulteration of food products)

Storage of product (to avoid adulteration)

**Specific objectives:**

Be aware of the type of packaging available and its suitability in accordance with the destination of the product and its use, final consumer, grocery channel, ... Regulations on labeling and additional information. Traceability from the field to the consumer

**Related activities:**

Activity 1

Activity 2

Activity 3

Activity 5: Product and Brand design activity

**Full-or-part-time:** 13h

Theory classes: 10h

Laboratory classes: 3h

## ACTIVITIES

### master class

**Description:**

Classes in which the teacher explains the basic concepts of the subject that must serve as a starting point for the rest of the activities that are carried out.

**Material:**

Audiovisual documentation that will be delivered to the student in advance

**Full-or-part-time:** 28h

Theory classes: 28h

### Activity: Exams

**Description:**

There will be two examinations to assess the knowledge acquired throughout the course

**Full-or-part-time:** 3h

Theory classes: 3h

### Activity 3: Case study

**Description:**

Real situations will be considered, which will be analyzed technically and economically in order to make alternative proposals that are feasible

**Material:**

Documentation necessary for the discussion of each case

**Full-or-part-time:** 10h

Theory classes: 10h

### Activity 4: Technical visits

**Description:**

Technical visits will be made to different companies and research centers that allow us to know the post-harvest sector and the transformation of the products of orchard and fruit

**Specific objectives:**

To know different business realities and opportunities for fruit and vegetable products

**Related competencies :**

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**Full-or-part-time:** 14h

Practical classes: 14h



### Activity 5: Product and brand design

**Description:**

The student will prepare a food product based on fruit and / or vegetables that will have to pack, label, create brand and product purpose (story telling)

**Material:**

The product will be made with products from the fields of ESAB or Agropolis. The preparation is carried out at the ESAB food pilot laboratory and will provide the necessary material

**Delivery:**

The work will consist of the elaborated product, labeled packaging and a brief explanatory prospectus

**Related competencies :**

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**Full-or-part-time:** 6h

Practical classes: 6h

## GRADING SYSTEM

$$N_f = N_1 * 0.40 + N_2 * 0.40 + N_3 * 0.20$$

N1: first exam mark (90% theory mark + 10% attendance to field trip)

N2: second exam mark (90% theory mark + 10% attendance to field trip)

N3: work note delivered in the activity of 'Product and brand design'

## BIBLIOGRAPHY

**Basic:**

- Florkowski, Wojciech J. Postharvest handling : a systems approach. Third edition. San Diego: Academic Press, [2014]. ISBN 9780124081376.

**Complementary:**

- Aguiló Aguayo, Ingrid; Plaza, Lucía. Innovative technologies in beverage processing. Chichester, West Sussex ; Hoboken, NJ: John Wiley & Sons, 2017. ISBN 9781118929377.