

Course Unit	Post-harvest Technology		Field of study	Management and Administration	
HPTC in	Food Technology		School	School of Agriculture	
Academic Year	2020/2021	Year of study	2	Level	0-2
Type	Semestral	Semester	1	ECTS credits	3.0
Workload (hours)			81	Contact hours	
			T	-	TP
			PL	-	TC
			S	-	E
			OT	30	O
			Code 4071-579-2007-00-20		

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) Luís Manuel Cunha Santos, Maria Fátima Alves Pinto Lopes da Silva

Learning outcomes and competences

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

1. To know the technologies, processes and procedures used during and just after the harvesting, and the plants and equipments required;
2. To know the factors intervening on the harvesting timing;
3. To know the plants and equipments for sorting, cleaning and storage of fruits and vegetables;
4. To know the standards and calibration equipments;
5. Cold and controlled atmosphere storage: to know how to choose the best temperature - relative humidity binomial and gas mixture combinations; to know how to avoid errors in the storage chambers;
6. To know the systems for modified atmosphere packaging.

Prerequisites

Before the course unit the learner is expected to be able to:
Not applicable.

Course contents

Harvesting fruits and vegetables. Harvesting timing. Transportation. Receipt. Sorting and cleaning. Calibration and standardization. Factors affecting postharvest fruit and vegetables quality. Plants and equipments for cold storage. Plants and equipments for controlled atmosphere storage. Monitoring and control of plants, equipments and products. Temperature - relative humidity binomials. gas mixture combinations in controlled atmosphere. Packaging and use of modified atmospheres.

Course contents (extended version)

1. Harvesting fruits and vegetables technology
 - Equipment
 - Operation conditions and performance
 - Harvesting timing
 - Mechanical harvesting costs
2. Transportation, reception, sorting and cleaning procedures
 - Equipment and performance
3. Calibration and standardization
4. Factors affecting postharvest quality
 - Quality attributes
 - Pre-harvest factors
 - Temperature, relative humidity, supplemental treatments applied to the commodity
5. Plants and equipments for cold storage. Compressors, evaporators, diffusers, isolation
6. Facilities and equipment for controlled atmosphere (CA)
 - Sealing of the chambers
 - Cold installation
 - The generation and maintenance of AC
 - Latest techniques (dynamic AC, AC with low ethylene CA in combination with 1-MCP)
7. Plants, equipments and products monitoring and control. Maintenance. Ethylene removal
 - Temperature - relative humidity binomials. Specification for each product
 - Controlled atmosphere gas mixture combinations. Specification for each product/variety
8. Modified Atmosphere (MA)
 - Fundamentals
 - Effects of MA (favorable and adverse)

Recommended reading

1. Pineda de las Infantas, M. T. S., (2004) Procesos de Conservación Poscosecha de Produtos Vegetales. 1ª Ed., A. Madrid Vicente, Ediciones. Madrid
2. Salunkhe, D. K.; Kadam, S. S. (1998) Handbook of Vegetable Science and Technology - Production, Composition, Storage and Processing, Marcel Dekker, Inc.
3. Southgate, D. (1992) Conservación de frutas y hortalizas, 3ª ed., Editorial Acribia, S. A., Zaragoza.
4. Ortiz-Cañavate (2003) Las Máquinas Agrícolas y su Aplicación Ediciones Mundi-Prensa, Madrid
5. Valero, D. (2010) Postharvest biology and technology for preserving fruit quality. Daniel Valero & Maria Serrano. CRC Press, Boca Raton. ISBN 978-1-4398-0266-3

Teaching and learning methods

Theoretical and practical lectures, covering: audiovisual resources, study visits to the field and protected crops facilities and cold storage and controlled atmosphere of fruits and vegetables.

Assessment methods

1. Ongoing evaluation - (Regular, Student Worker) (Final, Supplementary, Special)
 - Reports and Guides - 20%
 - Final Written Exam - 80%
2. Final evaluation - (Student Worker) (Final, Supplementary, Special)
 - Final Written Exam - 100%

Language of instruction

Portuguese

Electronic validation

Luís Manuel Cunha Santos, Maria Fátima Alves Pinto Lopes da Silva	Vitor Manuel Ramalheira Martins	Clementina Maria Moreira dos Santos	Elsa Cristina Dantas Ramalhosa
04-11-2020	05-11-2020	05-11-2020	05-11-2020