

# POSTHARVEST TECHNOLOGY OF HORTICULTURAL CROPS (I)

(Horticulture, 4th Year, 7th Semester)

**Number of transferable credits (ECTS):** 4

**Course category:** specialized discipline.

**Discipline holder:** PhD Professor Liviu Mihai IRIMIA

## **Discipline objectives (course and practical works):**

The discipline *Postharvest Technology of Horticultural Crops* aims to prepare students from the Horticulture specialization to understand, apply and optimize the handling, storing and processing horticultural crops, while maintaining their quality.

The specific objectives of the discipline are: understanding the biological, chemical and physical characteristics of horticultural crops, knowledge and understanding of the physiological processes that occur in horticultural crops after harvest (respiration, transpiration, ripening), knowledge of technologies for preserving horticultural products in a fresh state, knowledge of the factors that influence the long-term preservation of vegetables and fruits (temperature, humidity, controlled atmosphere), knowledge of the regulations and conditions for packaging, labeling, storage and transportation of horticultural crops, knowledge of food safety standards for horticultural crops (HACCP, GLOBALGAP).

## **Course content**

Course
1. Technological characterization of fruits and vegetables: classification of vegetables and fruits, physical properties, structural-textural firmness.
2. Chemical composition of fruits and vegetables: water content, organic substances, mineral substances.
3. Post-harvest biological processes in fruits and vegetables: respiration, transpiration, ripening.
4. Fresh fruit and vegetable processing flow: harvesting, pre-sorting, pre-cooling, sorting, calibrating, washing, waxing.
5. Packaging of vegetables and fruits.
6. Storage of vegetables and fruits: types of storage, preservation factors.
7. Factors that determine the quality of fruits and vegetables: technological factors; natural factors; harvesting, transportation, handling conditions; storage conditions.
8. Spoilage of vegetables and fruits: physiological disorders, microbiological alterations, chemical alterations.
9. Fruit and vegetable quality analysis: batch analysis, physicochemical determinations, point method.
10. Risk factors for food safety of vegetables and fruits: biological risks, chemical risks, physical risks.
11. Food safety management systems for vegetables and fruits: GLOBALGAP, HACCP.

## **Practical works**

1. Taking samples for analysis.
2. Evaluation of the structural-textural firmness of vegetables and fruits.
3. Evaluation of the ripening of vegetables and fruits.
4. Determination of titratable acidity and pH of vegetables and fruits.
5. Determination of soluble dry matter content and gluco-acidimetric index of vegetables and fruits.
6. Determination of L-ascorbic acid (vitamin C) content in fruits and vegetables.
7. Determination of soluble carbohydrates in horticultural crops.
8. Determinations regarding the evolution of firmness, SUS, total acidity and gluco-acidimetric index of apples during storage.
9. Evaluation of apple quality according to the specific commercial standard and the points method.
10. Determination of the quality, juice content and chemical composition of table grapes.
11. Analysis of catalase activity in potatoes.
12. Visit to the Cotnari Fruit Warehouse.

### Bibliography

Bartz J., , Brecht J.K., 2002. *Postharvest Physiology and Pathology of Vegetables*. CRC Press.  
 Beceanu D., 2010. *Post-harvest technology of horticultural crops*. PIM Publ. House, Iași.  
 Irimia L., 2013. *Quality control of fruits, vegetables and processed products from fruits and vegetables*. “Ion Ionescu de la Brad” Publ. House, Iași.

### Final evaluation

	Evaluation method	% from final
Course	Examination	70%
	Attendance at the course	10%
Practical works	Test, practical activities.	20%

### Contact person

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# POSTHARVEST TECHNOLOGY OF HORTICULTURAL CROPS (II)

(Horticulture, 4th Year, 8th Semester)

**Number of transferable credits (ECTS):** 5

**Course category:** specialized discipline (mandatory).

**Course holder:**

**PhD Professor Liviu Mihai IRIMIA**

**Discipline objectives:**

The discipline Technology of Horticultural Crops (II) aims to prepare students from the Horticulture specialization to understand, apply and optimize the specific processes of handling, preserving and processing vegetables and fruits, while maintaining their quality.

The specific objectives of the discipline are: knowledge of the technologies for the valorization of pome fruits, stone fruits, grapes, strawberries and nuts; knowledge of the technologies for the valorization of tomatoes, potatoes, bulbous plants, root crops; knowledge of the principles and methods of processing and preserving vegetables and fruits; knowledge of the technologies for preservation by dehydration, concentration and thermosterilization; knowledge of the technology of semi-industrialized products.

**Course content**

Course
1. Post-harvest technology of pomaceous fruits.
2. Post-harvest technology of drupaceous fruits.
3. Post-harvest technology of strawberries, grapes and nuts.
4. Post-harvest technology of tomatoes, potatoes, roots and onion.
5. Raw and auxiliary materials and processes for processing and preserving vegetables and fruits.
6. Technology of semi-industrialized fruit and vegetable products.
7. Technologies of concentration, dehydration and thermosterilization of vegetables and fruits.
8. Auxiliary materials and processes for processing and preserving vegetables and fruits.
9. Food safety management systems for fruits and vegetables.

Practical works
1. Analysis of quality standards in carrots, potatoes, onions.
2. Analysis of quality standards in apples, plums and grapes.
3. Analysis of physico-chemical parameters of apples at two different times during storage.
4. Analysis of auxiliary materials: salt and sugar.
5. Analysis of auxiliary materials: drinking water and vinegar.
6. Determining the presence of biological risks on fresh vegetables and fruits, using microbiological tests ( <i>Listeria</i> , <i>Escherichia</i> , <i>Salmonella</i> ).

7. Analysis of quality indices of thermo-sterilized products from vegetables (peas, beans, pods).
8. Analysis of the quality indices of the thermo-sterilized fruit products.
9. Sensory analysis and determination of the composition parameters of tomato paste.

### References

1. Irimia L., 2013. *Controlul și expertiza calității legumelor, fructelor și produselor derivate* (Quality control of fruits, vegetables and processed products from fruits and vegetables). Ed. “Ion Ionescu de la Brad”, Iași.
2. Beceanu D., Chira A., 2011. *Tehnologia produselor horticole. Valorificare în stare proaspătă* (Fresh fruits and vegetables valorisation), Ed. PIM, Iași.
3. Beceanu D., 2010. *Tehnologia prelucrării legumelor și fructelor* (Fruits and vegetables processing). Ed. PIM, Iași.

### Final evaluation

	Evaluation method	% from final
Course	Examination	70%
	Attendance at the course	10%
Practical works	Test, practical activities.	20%

### Contact person

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