

## POSTHARVEST PHYSIOLOGY AND TECHNOLOGY

### COURSE OUTLINE

#### 1. GENERAL

<b>SCHOOL</b>	AGRICULTURAL SCIENCES		
<b>DEPARTMENT</b>	AGRICULTURE		
<b>LEVEL OF COURSE</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	AGRI_701	<b>SEMESTER OF STUDIES</b>	7 <sup>th</sup>
<b>COURSE TITLE</b>	POSTHARVEST PHYSIOLOGY AND TECHNOLOGY		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		<b>TEACHING HOURS PER WEEK</b>	<b>ECTS CREDITS</b>
Lectures		2	
Laboratory exercises		2	
Total		4	5
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	General Background		
<b>PREREQUISITE COURSES:</b>	Typically, there are not prerequisite courses.		
<b>TEACHING AND ASSESSMENT LANGUAGE:</b>	Greek. Teaching may be however performed in English in case foreign students attend the course.		
<b>THE COURSE IS OFFERED TO ERASMUS STUDENTS</b>	Yes		
<b>COURSE WEBPAGE (URL)</b>			

#### 2. LEARNING OUTCOMES

<p><b>Learning outcomes</b> <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> <li>• <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i></li> <li>• <i>Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i></li> <li>• <i>Guidelines for writing Learning Outcomes</i></li> </ul>
<p>At the end of this course the students will be able to understand:</p> <ul style="list-style-type: none"> <li>• basic issues of the post-harvest physiology of fruit and vegetable crops and the available post-harvest technology that allows the management, handling and storage of the products.</li> </ul>

- the postharvest physiology of fresh fruit and the physiological parameters that affect the postharvest life and behavior of fruit and vegetable growers.
- They know the concept of quality, the main quality characteristics of fruit and vegetables and the pre- and post-harvest factors that affect it.
- . Assess the ripeness and quality of fruit and vegetable products using simple techniques and devices.
- They propose post-harvest handling of the main fruit and vegetable products.
- Recognize the main post-harvest physiological disorders and diseases of fruit and vegetables.
- They apply the harvesting maturity criteria.
- They handle the fresh fruits after harvest.
- They know the preservation and handling technologies of fresh fruits.

### **General Abilities**

*Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?*

*Search for, analysis and synthesis of data and information, with the use of the necessary technology*  
*Adapting to new situations*  
*Decision-making*  
*Working independently*  
*Team work*  
*Working in an international environment*  
*Working in an interdisciplinary environment*  
*Production of new research ideas*

*Project planning and management*  
*Respect for difference and multiculturalism*  
*Respect for the natural environment*  
*Showing social, professional and ethical responsibility and sensitivity to gender issues*  
*Criticism and self-criticism*  
*Production of free, creative and inductive thinking*

### General Skills:

Search, analysis and synthesis of data and information, using also the necessary technologies:

- Autonomous work
- Teamwork
- Decision making
- Generation of new research ideas

- Promotion of free, creative, and inductive thinking

### **3. SYLLABUS**

#### **Theory:**

1. Physiology, biochemistry of fruit ripening. Maturational changes.
2. Quality and chemical composition of fruits.
3. Harvest maturity criteria, harvesting, losses during transport.
4. Changes in the physiology of fresh fruits after harvest.
5. pre-and post-harvest influencing factors on the post-harvest life of fruits.
6. post-harvest handling of fruits of fruit trees (apples, stone fruits, blackberries).
7. Postharvest handling of fruits of fruit trees (subtropical-tropical species, small fruits).
8. post-harvest handling of grapes, vegetables, flowers.
9. Pre-cooling and fruit preservation methods.
10. Conservation technologies.
11. Physiological disorders and injuries during conservation.
12. Standardization, packaging, marketing. Minimally processed fruits and vegetables.
13. Microbial postharvest management. Risks in postharvest management from non-phytopathogenic microorganisms.  
Threats and post-harvest protection technology.

#### **Laboratory Exercises**

1. The role of respiration, transpiration and ethylene biosynthesis in the post-harvest life and quality of products.
2. Climacterial ripening of fruits
3. post-harvest handling of fruit trees
4. post-harvest handling of grapes, vegetables, flowers.
5. Maintenance technologies.

6. Microbial postharvest management of fruits and vegetables.

#### 4. TEACHING AND LEARNING METHODS - EVALUATION

<p><b>TEACHING METHOD</b> <i>Face-to-face, Distance learning, etc.</i></p>	Lectures in the class and in the laboratory (face to face)	
<p><b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</b> <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	Use of Information and Communication Technologies (ICTs) (e.g., powerpoint) in teaching. Direct communication with the students (face to face and by e-mail), Support of the learning process and uploading of the educational material to the electronic platform (e-class): <a href="https://eclass.upatras.gr">https://eclass.upatras.gr</a>	
<p><b>TEACHING METHODS</b> <i>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i></p> <p><i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i></p>	<b>Activity</b>	<b>Semester workload</b>
	Lectures (2 conduct hours per week x 13 weeks)	26
	Laboratory practice (2 conduct hours per week x 6 weeks)	12
	Field practice	10
	total examinations (2 conduct hours each)	2
	Hours for private study of the student and preparation for mid-term or/and final examination / Final examination	75
	<b>Total number of hours for the Course (25 hours of work-load per ECTS credit)</b>	<b>125 hours (total student work-load)</b>
<p><b>STUDENT PERFORMANCE EVALUATION</b> <i>Description of the evaluation procedure</i></p> <p><i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>The evaluation criteria are presented and analyzed to the students at the beginning of the semester.</p> <ul style="list-style-type: none"> <li>• Final written theory exam (60%).</li> <li>• Final examination of laboratory exercises (40%).</li> </ul> <p>In case of advances, they participate by 30% in the final score, respectively.</p>	

#### 5. RECOMMENDED LITERATURE

**Books:**

1. Βασιλακάκης Μ., 2010. Μετασυλλεκτική Φυσιολογία - Μεταχείριση Οπωροκηπευτικών και Τεχνολογία. Εκδόσεις Γαρταγάνης, σελ 577.
2. Πάσσαμ Χ., Τσαντίλη Ε., Χριστόπουλος Μ., Καυκαλέτου Μ., Αλεξόπουλος Α. και Καραπάνος Ι., 2015. Μετασυλλεκτική Μεταχείριση Καρπών και Λαχανικών. Ελληνικά Ακαδημαϊκά Ηλεκτρονικά Συγγράμματα και Βοηθήματα.

Rodrigues Sueli, Fernandes Fabiano Andre Narciso, 2012. *Advances in Fruit Processing Technologies*. CRC Press, 472p