

Biotechnical Faculty / PLANT PRODUCTION / HARVEST, STORAGE AND PACKING OF FRUITS

Course:	HARVEST, STORAGE AND PACKING OF FRUITS			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
5997	Mandatory	6	5	2+0+1
Programs	PLANT PRODUCTION			
Prerequisites	None.			
Aims	To introduce students with the basic principles and technologies of harvesting, keeping and packaging of the fruit and distribution of fruits.			
Learning outcomes	After passing this exam, student will be able to: • Assesses the right harvest date and stage of fruit maturity (botanical, physiological or for consumption). • Assesses productional and economical importance of fruit species and ways of harvest of certain species of fruit and grapes. • Indicates the correct procedures for fruits handling from the harvest place to the storage in the chamber for storing fruits and grapes. • Selects the best type of packaging (wood, plastic, cardboard, cloth, metal) for the packing and transportation of fruit and grapes. • Applies appropriate way of storage for fruits and grapes.			
Lecturer / Teaching assistant	PhD Miroslav Čizmović			
Methodology	Lectures, exercises, colloquiums, seminar paper and Final exam.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	The importance of the course, chemical composition, structure and properties of the fruit, physiological processes in the harvested fruits.			
I week exercises	Organic and inorganic substances in fruits.			
II week lectures	Indicators of maturity and mode of determining the the moment of harvest, organisation of harvest.			
II week exercises	Biochemical processes in the harvested fruits; transpiration and respiration.			
III week lectures	Handling and postharvest techniques, shelf life ability of different fruits species.			
III week exercises	Iodine - starch test and T stage.			
IV week lectures	Facilities and conditions for storage the fruits.			
IV week exercises	Determination of tannins as an indicator of maturity.			
V week lectures	Keeping the pome fruit species.			
V week exercises	Orientational methods of determining the stage of maturity.			
VI week lectures	Storage the stone and berry fruits.			
VI week exercises	Penetrometry determination of the stage of maturity.			
VII week lectures	Keeping the subtropical fruits, grape and imported tropical and exotic fruits.			
VII week exercises	Dry matter determination by refractometer.			
VIII week lectures	Colloquium I.			
VIII week exercises	The acid content in the fruit and sweetness index determination.			
IX week lectures	Standards for storage in developed countries, packing house.			
IX week exercises	Corrective colloquium I			
X week lectures	Cooling facilities, pre-cooling, fruit treatment's before storage, losses in storage.			
X week exercises	The cooling system constuction.			
XI week lectures	NA, CA, ULO, ULE, storage facilities.			
XI week exercises	Calculation of the required size of the cooling facilities.			
XII week lectures	MAP, 1-MCP and other postharvest advanced tehniques.			
XII week exercises	Fruits treatment that extended their shelf life.			
XIII week lectures	Sorting, storage and quality standards (HACCP, GLOBALGEP).			
XIII week exercises	Machines for sorting fruits.			

XIV week lectures	Colloquium II.					
XIV week exercises	Physiological disorders caused by storing, practical work.					
XV week lectures	The keeping disease pathology, packing (types of packaging) and transportation of fruits. Corrective colloquium II.					
XV week exercises	The deterioration of stored fruit caused by pathogen attack, practical work.					
Student workload						
Per week			Per semester			
5 credits x 40/30=6 hours and 40 minuts 2 sat(a) theoretical classes 1 sat(a) practical classes 0 excercises 3 hour(s) i 40 minuts of independent work, including consultations			Classes and final exam: 6 hour(s) i 40 minuts x 16 =106 hour(s) i 40 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 6 hour(s) i 40 minuts x 2 =13 hour(s) i 20 minuts Total workload for the subject: 5 x 30=150 hour(s) Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) 30 hour(s) i 0 minuts Workload structure: 106 hour(s) i 40 minuts (courses), 13 hour(s) i 20 minuts (preparation), 30 hour(s) i 0 minuts (additional work)			
Student obligations			The presence of lectures, laboratory and field exercises, doing the seminar paper, both colloquiums and Final exam			
Consultations						
Literature			1. Gvozdenović, D., Davidović, M. (1990): Berba i čuvanje voća, Nolit, Beograd, 2. Ilić, Z., Fallik, E., Đurovka, M., Martinovski, Đ., Trajković, Radmila (2007): Fiziologija i tehnologija čuvanja povrća i voća, Tampograf, Novi Sad, 3. Prenkić, R., Čizmović, M. (2010): Skripta Berba, čuvanje i pakovanje voća i grožđa 4. Pašalić, B. (2006): Berba, pakovanje i skladištenje plodova voća, praktikum, Banja Luka			
Examination methods			- Presence and activity 5 = 5 - Seminar paper = 15 - Colloquium 2 x 15 = 30 - Final exam = 50			
Special remarks						
Comment						
Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points