

Biotechnical Faculty / FIELD AND VEGETABLE CROPS / PROCESSING TECHNOLOGY OF FIELD AND VEGETABLE CROPS

Course:	PROCESSING TECHNOLOGY OF FIELD AND VEGETABLE CROPS			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
12352	Mandatory	2	5	3+1+0
Programs	FIELD AND VEGETABLE CROPS			
Prerequisites	None			
Aims	Acquiring knowledge about technological properties, the importance of consumption and the way of adequate storage of vegetable products; the technology of preservation and production of bread, beer, ethyl alcohol, sugar, oil and fat			
Learning outcomes	students will be able to: analyze the quality of vegetables: mechanical and chemical composition; organize preparatory operations for processing vegetables and technological operations for canning vegetables; analyze the impact of agrobiological factors on the preservation of fresh vegetables; analyze the quality of vegetables during harvest; familiarize with technological procedures for: production of malt and beer, flour and bread, production of bioethanol, production of molasses and sugar; as well as oils and fats.			
Lecturer / Teaching assistant	Prof. Dr. Radmila Pajović-Šćepanović Dr. Ana Velimirovic			
Methodology	Lectures, exercises in the laboratory, visits to processing facilities (brewery, distillery and vegetable processing), consultations, seminar work, colloquiums and final exam.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction to course; Importance of vegetables in diet			
I week exercises	Technological properties of vegetables;			
II week lectures	Mechanical and chemical composition; Technological maturity; Vegetables and vegetable products;			
II week exercises	Sampling and technical analysis of raw materials and finished products;			
III week lectures	Canning technology - preparatory operations and principle of canning procedures;			
III week exercises	Control and quality assessment of vegetables: supply of raw materials, grading, elements of quality assessment and grading			
IV week lectures	Canned vegetable products: sterilized, pasteurized, marinated, biologically preserved, frozen, dried vegetables and vegetable juice;			
IV week exercises	Control of technological procedure and product quality; Calculation of total acid content and table salt percentage;			
V week lectures	The influence of agrobiological factors during the growing season on the preservation of fresh vegetables;			
V week exercises	Determination of dry matter content (by drying and refractometry);			
VI week lectures	Colloquium I; Characteristics and quality of fresh vegetables;			
VI week exercises	Analytical assessment of ripeness: physical methods, optical measurements;			
VII week lectures	Harvesting vegetables;			
VII week exercises	Analytical assessment of ripeness: chemical composition, sensory assessment;			
VIII week lectures	Processing of vegetables before storage; Specificity of keeping certain vegetable species;			
VIII week exercises	External factors that influence the length of storage: temperature, relative humidity, light, air composition;			
IX week lectures	Raw materials for beer production, Malt production, Technological process of beer production;			
IX week exercises	Visit to the brewing industry;			
X week lectures	Baking technology, production and chemical composition of flour; Bread production technology;			
X week exercises	Visit to the bakery industry;			
XI week lectures	Ethyl alcohol production technology; Raw materials for the production of bioethanol;			
XI week exercises	Determination of ethanol content by distillation and using the Anton Paar instrument;			

XII week lectures	Sugar technology; Basics of the technological procedure of sugar beet processing and molasses preparation;					
XII week exercises	Determination of sugar content - method according to Luff Schoolr;					
XIII week lectures	Colloquium II;					
XIII week exercises	Determination of acidity in agricultural and vegetable products (total acidity and pH);					
XIV week lectures	Oil and fat technology;					
XIV week exercises	Determination of fat and oil content by Soxlett;					
XV week lectures	Visit to distillation and rectification plants;					
XV week exercises						
Student workload	Weekly 5 credits x 40/30 = 6 hours and 40 minutes Structure: 3 hours of lectures, 1 hour of exercises, 1 hour and 40 minutes of independent work, including consultations During the semester: Classes and final exam: 6 hours and 40 minutes x 16 weeks = 106 hours and 40 minutes Necessary preparations before the beginning of the semester (administration, registration, certification) 2 x 6 hours and 40 minutes = 13 hours and 20 minutes Total workload for the course: 5 x 30 = 150 hours Supplementary work for exam preparation in the remedial period, including taking the remedial exam from 0 to 30 hours Load structure: 106 hours and 40 minutes (teaching), 13 hours and 20 minutes (preparation) and 30 hours (additional work).					
Per week	Per semester					
5 credits x 40/30=6 hours and 40 minuts 3 sat(a) theoretical classes 0 sat(a) practical classes 1 excercises 2 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	Students are required to attend classes, do exercises in the laboratory, do both colloquiums and the final exam.					
Consultations	Tuesdays from 13:00 to 14:00.					
Literature	1. Niketić-Aleksić, G. (1982): Tehnologija voća i povrća, Poljoprivredni fakultet, Beograd; 2. Ilić, Z, Fallik, E., Đurovska, M., Martinovski, Đ., Trajkovski, R. (2007): Fiziologija i tehnologija čuvanja povrća i voća, Tampograf, Novi Sad; 3. Žeželj, M.: (2005): Tehnologija žita i brašna, Poljoprivredni fakultet, Beograd; 4. Vereš, M. (1991): Osnovi konzervisanja namirnica, Naučna knjiga Beograd; 5. Niketić-Aleksić, G., Vereš, M., Zlatković, B., Rašković, V.(1989): Priručnik za industrijsku preradu voća i povrća, Naučna knjiga, Beograd; 6. Vračar, Lj. (2001): Priručnik za kontrolu svežeg i prerađenog voća, povrća i pečurki i osvežavajućih bezalkoholnih pića, Tehnološki fakultet, Novi Sad; 7. Šakić, N. (2005) Tehnologija proizvodnje piva. Gospodarska komora Federacije BH, Sarajevo					
Examination methods	Activities in lectures and exercises 5 points; Seminar 5 points (oral); Two colloquiums of 20 points each; Final exam 50 points. Grades and points: A (≥ 90 to 100 points); B (≥ 80 to < 90); C (≥ 70 to < 80); D (≥ 60 to < 70); E (≥ 50 to < 60) F < of 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