

Biotechnical Faculty / CONTINENTAL FRUIT GROWING AND MEDICAL PLANTS / PLANT PHYSIOLOGY

Course:	PLANT PHYSIOLOGY			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
2857	Mandatory	1	6	3+0+2
Programs	CONTINENTAL FRUIT GROWING AND MEDICAL PLANTS			
Prerequisites	No prerequisites required			
Aims	Students will through theoretical and practical work learn the basics of plant physiology.			
Learning outcomes	After getting the passing grade, the student will be able to: - Identify basic physiological processes in plants - Describe metabolism compartments in the cell, the water regime of plants, macroelements and microelement metabolisms, photosynthesis and respiration. - Recognize the effect of shortage and excess of elements. - Describe the growth and development of plants, hormonal regulation, physiology of seeds and fruits - Explain the plant resistance to the effects of biotic factors. - Recognize the connection between the results of experimental work and theoretical knowledge - Students should also be able to: develop critical thinking about the themes of the program, the implementation of effective teaching methods, teamwork and evaluation of teaching.			
Lecturer / Teaching assistant	Prof dr. Šebek Gordana , dr Stojanović Milena, laborant Jelena Vukčević			
Methodology	student engagement, homework, both tests, test L and final exam			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction. Concept, significance and the task of plant physiology.			
I week exercises	Introducing students to work in the lab. Laboratory glassware and instruments. Familiarising with measuring instruments for determining mass and volume. Preparing percentage and molar concentration solutions.			
II week lectures	Physiology of plant cells. Cell organelles (structure characteristics, chemical composition, functions)			
II week exercises	Plant cell as an osmotic system. Artificially differentially permeable membranes, example of diffusion and osmosis. Proof: The layer that creates Cu ₂ Fe(CN) ₆ has the properties of differentially permeable membrane.			
III week lectures	Receiving and disclosure of water. Exam task 1			
III week exercises	Measuring of water potential in potato tissue (0.1 to 0.6 M and 1M of saccharose solution). Observing movements of stomata under the microscope while water potentials change.			
IV week lectures	Photosynthesis. Chloroplasts. Photosynthetic pigments. The importance of sunlight for photosynthesis.			
IV week exercises	Isolation of chloroplasts. Determining the concentration of chlorophylls and the amount of chloroplasts with the use of spectrophotometric method.			
V week lectures	Dark phase of photosynthesis. Reductive photosynthetic cycle. Photorespiration.			
V week exercises	Determining the amount and the relation of chlorophylls in sample a and in sample b of plant tissue by using spectrophotometric method.			
VI week lectures	Secondary products of photosynthesis. Indicators of photosynthesis. First test			
VI week exercises	Photosynthesis and productivity in different ecological conditions.			
VII week lectures	Respiration. Carbohydrates (Glycolysis, Krebs cycle), lipids and proteins as substrate for respiration. Make-up first test			
VII week exercises	Observing the course of plasmolysis and deplasmolysis under the microscope. Proof: the epidermis of onion in 1 M of saccharose solution			
VIII week lectures	Content of elements in plants and their classification. A mechanism of ions adoption through the roots and through the leaves.			
VIII week exercises	Demonstration of oxygen release throughout the entire plant.			
IX week lectures	Significance of major elements in the life processes of plants. Symptoms of macroelements' shortage and excess.			
IX week exercises	Determining the total mineral composition of the ash.			
X week lectures	The significance of major elements in the life processes of plants. Symptoms of microelements'			

	shortage and excess.					
X week exercises	Sample preparation for the determination of organic nitrogen, with the use of the wet process by Kjeldahl method.					
XI week lectures	Growth and development of plants. Cell and tissue culture. Exam task 2					
XI week exercises	Determining the necessary mineral elements for the growth and development of certain crops. (e.g. tomato)					
XII week lectures	Physiologically active substances. Auxins, gibberellins, cytokinins, ABA, ethylene.					
XII week exercises	Germination of pollen grains of different plant species and the percentage of germination in the presence of saccharose.					
XIII week lectures	Pollination and fertilization. Physiology of seeds. Chemical composition of seeds. Sleep process and germination of seeds. Factors affecting germination. Second test.					
XIII week exercises	Rooting of cuttings with a solution of IBA concentration.					
XIV week lectures	Second test.					
XIV week exercises	Common wheat seed germination. Plant movements.					
XV week lectures	Plant resistance to environmental conditions. Make-up second test.					
XV week exercises	Test L.					
Student workload						
Per week			Per semester			
6 credits x 40/30=8 hours and 0 minuts 3 sat(a) theoretical classes 2 sat(a) practical classes 0 excercises 3 hour(s) i 0 minuts of independent work, including consultations			Classes and final exam: 8 hour(s) i 0 minuts x 16 =128 hour(s) i 0 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 8 hour(s) i 0 minuts x 2 =16 hour(s) i 0 minuts Total workload for the subject: 6 x 30=180 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) 36 hour(s) i 0 minuts Workload structure: 128 hour(s) i 0 minuts (cources), 16 hour(s) i 0 minuts (preparation), 36 hour(s) i 0 minuts (additional work)			
Student obligations			Lessons attendance is mandatory for students, as well as doing practical exercises, exam tasks, both tests and the final exam.			
Consultations			In agreement with the students			
Literature			Literature: 1. Popović, Ž. :. Fiziologija biljaka Beograd, 1987. 2. Kastori, R. :. Fiziologija biljaka Beograd, Naučna knjiga, 1991. 3. Sarić, M. :. Fiziologija biljaka Beograd, Nauka, 1991. 4. Jelenić, Dj., Džamić, R. :. Fitofiziologija-praktikum, Beograd, 1989. 5. Miloje Sarić, Rudolf Kastori, Milun Petrović, Živko Stanković, Borivoj Krstić i Novica Petrović- Praktikum iz fiziologije biljaka, Naučna knjiga , Beograd, 1990			
Examination methods			The forms of testing and grading: 1. student engagement on lectures and exercises 4 points 2. homeworks 2 points 3. exam task 1 and 2 - 5 points each (total 10 points) 4. exam task L 4 points 5. first and second test - 15 points each (total 30 points) 6. final exam - 50 points			
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