Study program: Organic crop and livestock production

Type and level of study: Bachelor academic studies

Course Title: BASICS OF PLANT PHYSIOLOGY AND ANIMALS

Teachers: Dr. Jovanović B. Ljubinko, Full professor; Mihailo Radivojević, Assistant professor, Dr Slađan Rašić, Assistant professor

Status: Obligatory, semester III

ECTS: 8

Prerequisite: None

The goal of course

Introduction to basic processes in plants, transport of nutrients and water, timber root and leaf photosynthesis, the influence of various abiotic and biotic factors on plant.

The subject should enable the student to acquire knowledge about the functioning of the system of individual animal organism: cardiovascular, respiratory, digestive, urinary, endocrine, nervous and immune, the role of the skin and mammary glands, muscle physiology, thermoregulation, circulation and lymph, a physiological role of vitamins and minerals.

The outcome of the subject

On the basis of acquired knowledge, assessment activities of various abiotic and biotic factors to the plant, identifying the health status of plants in the field, measures to overcome the drought, distinguishing changes in plants, determining their cause and propose solutions.

At the end of the module the student should demonstrate knowledge (understanding) the following areas: the functional organization of the body and homeostasis, physiology: blood, immune system, heart, circulation, lymph, lymph and spleen, gas exchange in the lungs and tissues, nutrient digestion, thermoregulation, facts vitamins and minerals, formation and excretion of urine, skin and mammary glands, endocrine glands, physiology of muscles and the nervous system and the functioning of the perceptual organs sensitive nervous system. Knowledge gained form the basis for the acquisition of new knowledge in the vocational subjects in the senior years of study.

Syllabus

Theoretical study – Basics of plant physiology. Cells. Photosynthesis and factors affecting photosynthesis, C3, C4 and CAM type of photosynthesis, the effects of increasing CO2 on plants. Respiration in plants and interactions with the environment. Transport of assimilates in plants. Conductive tissues: phloem and xylem. Developments of apoaplastom and simplast. Water regime and water use, drought, water balance in plants. Energy balance in plants. Mineral nutrition and factors affecting mineral nutrition. Fundamentals of growth and development. Fundamentals of the physiology of seed. Stress physiology of rhizosphere: abiotic and biotic factor effects on rhizosphere organisms. Micro-organisms and roots. The role of the rhizosphere in agroecosystems.
Basics of Animal Physiology: Cardiovascular system: blood physiology, physiology of the heart, circulation; 2. Respiratory system: mechanism of gas exchange in the lungs and tissues; 3. digestive system: digestion of nutrients in mono and poligastric animals; 4. Urinary system: the mechanism of formation and excretion of urine; 5. Endocrine system: function and significance of endocrine glands; 6. The nervous and immune systems: the organization of the nervous system and the physiology of the body's defense against harmful factors; 7. Leather and mammary gland; Physiology of muscles; Thermoregulation; Lymph and lymph; 8. The physiological role of vitamins and minerals.

Practical classes - Preparing for work in the laboratory, overview of laboratory equipment, preparation of solutions, determination of pH, osmometry, work on the microscope, spectrophotometry (root surface), germination, Basic knowledge about statistic, EXEL spreadsheet tables, presentation etcetc.
Determination of haematological parameters 2. Determination of chemical and pathological ingredients 3. Testing for enzyme activity of the digestive tract and the determination of milk components 4. Measurement of blood pressure and pulse, auscultation of the heart sounds, spirometry and dissection laboratory animals 5. Tests contractile ability of muscles and individual reflex in mammal.

Literature

L. Strayer (1988) Biochemistry. W.H. Freeman and Company/New York
Lincoln Taiz and Eduardo Zeiger (2010): Plant Physiology, Fifth Edition Fifth Edition. Elsiver
William G. Hopkins and Norman P. A.(2008) Introduction to Plant Physiology Fourth Edition The University of Western OntarioJohn Wiley & Sons, Inc.
Linda E. Graham, Jim M. Graham, Lee W. Wilcox(2006): Plant Biology (2nd Edition).
https://www.studyblue.com/notes/b/plant-biology-2nd-edition/3514/0
Lauralee Sherwood, Hillar Klandorf, and Paul H. Yancey (2013) Animal Physiology: From Genes to Organisms. Second Edition, Brooks/Cole, Cengage Learnin
Ruth Lawson (2015): Anatomy and Physiology of Animals. en.wikibooks.org
Christopher D. Moyes and Patricia M. Schulte, (2005): Principles of Animal Physiology. Published by Daryl Fox

Number of lectures: 7				Other Classes
Lectures: 4	Practices: 3	Other forms of teaching:	Student research work:	

Teaching methods: Lectures, discussions with students, experimental exercises, preparation and public defense of practical applied work.

Score (maximum 100 points)

Pre-commitments	**Poens**	**The final exam**	Poens
Activity during lectures	10	Written exam	30
Practical classes	10	Oral examination	30
Colloquia	20		
Seminars	10		
Total	50		60