

Study Program: Biology			
Type and level of studies: Bachelor studies			
Course name: Comparative physiology			
Lecturer: Kosanović V. Katica			
Status: Compulsory			
ECTS: 6			
Attendance Prerequisites:			
Course aims			
Providing up-to-date knowledge about organ systems in different systematic categories, including humans, their functioning and functioning laws during phylogenetic development of the living world.			
Course outcome			
Elucidation of basic physiological phenomena and the phenomena of biological sciences in general and possibilities for independent experimental research.			
Course content			
<i>Theoretical part:</i>			
The subject of study and tasks of comparative physiology. Principles of comparative physiology. Unity of chemical substance and physiological processes of animals. Analogy and homology. External and internal environment. External relations and internal environment. Osmotic homeostasis. Hydrolymph, hemolymph, blood and lymph. Respiratory function of the body fluid Respiratory pigments. Body fluid buffer systems. Body fluid cells. Erythrocytes and erythropoiesis. Reticuloendothelial System: leukocytes, diapedesis and phagocytosis. Blood coagulation and the role of platelets. Immunity, allergy and anaphylaxis. Tissue and organ transplantation. Blood types and transfusion. Circulating body fluids. Transport mechanism types. Pulsatile organs. Automaticity and the conduction system of the heart. The functioning regulation of heart rate and blood pressure. Peripheral blood flow. Gas exchange. The role of the integument in gas exchange. Gill types. Functional features of the tracheal system. Intestinal breathing. Physiology of fish bladder. Regulation of respiratory function in vertebrates. Pulmonary ventilation. The function of air sacs in birds. Physiology of divers among birds and mammals. Nutrition and digestion. Endogenous and exogenous nutrition. Types of digestion. Digestion in the stomach and intestines. Digestion in ruminants and birds. Intestinal resorption. Thermoregulation. Body temperature and thermogenesis. Evolution of thermoregulation. Physical and chemical thermoregulation. Adaptation of thermogenesis to the new thermal environment. Physiology of excretion. Products of catabolism in animals. Purine catabolism and the evolutionary change of enzyme sets. Regulation of renal secretion and urine composition. Comparative physiology of the endocrine glands and senses.			
<i>Practical part:</i>			
Hemolymph and heart rhythm in snails. Capillary blood flow in frogs. Determining haemoglobin concentration in the blood of rats. Hb crystals and Teichmann crystals. The study of blood coagulation-determining coagulation time, the effect of temperature on coagulation time. Erythrocyte and leukocyte count. Determining the percentage of oxygen in the alveolar air of the frog— gas pipette. Determining the percentage of oxygen and carbon dioxide in human alveolar air using the orsat apparatus. Spirometry. Digestion in vine snails. Determination of the free fatty acid concentrations in rat serum— the starvation effect. Surgical removal of the adrenal gland— adrenalectomy.			
Literature			
1. Петровић, В. М Упоредна физиологија. Завод за уџб. и нас. Средства, Београд 1991. 2. Петровић, В.М., Радојичић Упоредна физиологија II део. Завод за уџб. и нас. Средства, Београд 1994. 3. Давидовић, В. Упоредна физиологија I Завод за уџб. I нас. Средства, Београд 2003.			
Number of active classes			Other classes:
Lectures: 3	Practical classes: 3	Other forms of teaching: 0	
Teaching methods			
Theoretical classes, practical classes (laboratory exercises), mandatory fieldwork, consulting.			
Assessment (maximum 100 points)			
Course assignments	points	Final exam	points
activity during lectures	5	written exam	10
seminars	5	oral exam	60
Term test/s	20		
Total	30		70