

Study program: Integrated academic studies of Medicine		
Course title: Physiology of Sport		
Teacher: Nada M. Naumović, Damir D. Lukač, Miodrag P. Drapšin, Jelena Ž. Popadić Gaćeša, Otto F. Barak, Dea I. Karaba Jakovljević, Aleksandar V. Klašnja, Vedrana V. Karan		
Course status: elective		
ECTS Credits: 3		
Condition: -		
Course aim The basic aims of the course in Sports Medicine are to acquaint students with basics of sports physiology, that is, physiological processes in the body that are specific for engaging in physical activity, and especially in efforts during professional sports.		
Expected outcome of the course: Understanding the basic mechanisms of functioning of different organ systems and aspects of the organization of regulatory mechanisms of complex homeostatic parameters into functional systems of higher order, induced by continuous physical activity of different forms and types. These informations should provide students with a dynamic insight into the functioning of the body and homeostasis during increased efforts and in extreme changes in the body that are induced by sport. The student should master the general principles and rules of conduct in the sports laboratory, to master the skill of performance and interpretation of laboratory procedures of functional testing. Regular examinations and physical fitness assessment of persons engaged in physical activity is a significant aspect of protecting the health of actors in physical activity and developing the health culture of the general population of a developed society.		
Course description <i>Theoretical education</i> Muscles: Neuro–muscular synapses. Types of muscles. Morpho-physiological characteristics of skeletal muscles. Contraction of skeletal muscles. Types of contractions. Motor unit. Types of muscle fibers and sports. Work, power and muscle fatigue. The physical aspects of human work (force, power, work). Smooth muscles. Bioenergetics: Energy and the role of nutrients, energy sources in the human body. Anabolism and catabolism. Minerals and vitamins. Methods for measuring energy flow and energy deposition. Respiratory coefficient. Glycogen supercompensation. Lactic acid. Basal metabolism. Energy transfer under workloads. Daily diet composition. Special diet of athletes depending on the age and type of physical activity. Homeostasis: Regulation of acid - base balance. Chemical and physiological buffers. Glycemic regulation. Regulation of body calcium levels. Regulation of protein metabolism (impact of physical activity on anabolic processes in the body). Ergometry: Energetic capacities and their measurement. "Steady State". Sports training and types of training. Dynamic stereotype. Reaction time. Stress: The theory of stress, stages of stress, stressor. The role of sport and recreation according to the modern theory of functional systems in the perception and adaptation to harmful effects of stress. Overtraining and its implications on functional abilities of athletes. Injuries and their prevention. Chronobiology and its importance in sports. Circadian rhythm. <i>Practical education</i> 1. Assessment of functional abilities (functional test selection, selection of workload type). 2. Determination of aerobic capacity (determining maximal oxygen uptake, "vita maxima" and "all - out" tests, Astrand test, indirect tests). 3. Determination of anaerobic capacity (Wingate anaerobic test, maximum power, the average power, explosive power, fatigue index; determining oxygen debt and oxygen deficit). 4. Determination of steady states (test selection, heart rate monitoring, monitoring of respiratory parameters, oxygen consumption monitoring). 5. Determination of heart rate (palpation, auscultation, heart rate monitoring by ECG). 6. Measurement of arterial blood pressure . 7. Dynamometry (dynamometry equipment, basic parameters of dynamometric testing of muscular strength, arm flexor strength testing, arm extensor strength testing, leg extensor strength testing). 8. Analysis of body composition - basic anthropometrics measurements (basic instruments - scales, pelvimeter, slide calipers, calipers, centimeter tape; determining of BMI; somatotype determination, calculation of physical constitution by Heath - Carter , determining body fat mass utilizing bioelectrical impedance).		
Literature <i>Compulsory</i> 1. Costill D, Wilmore J. Physiology of Sport and Exercise, Human Kinetics 2015. 2. William D, Katch IF, Katch VL. Exercise Physiology. Wolters Cluver,2014.		
Number of active classes	Theoretical classes: 30	Practical classes: 15

Teaching methods			
Lecture. Practical work.			
Student activity assessment (maximally 100 points)			
Pre-exam activities	points	Final exam	points
Lectures	20	Written	60
Practices	20	Oral	
Colloquium		
Essay			