MEDICAL PHYSIOLOGY
PLAN FOR MAKE-UP OF CLASSES FROM SUMMER SEMESTER academic year 2024/25

Exercises will be held on **Tuesday** at **Classrooms A/C** (**group I**) and in **Classrooms B/D** (**group II**) of the Institute of Medical physiology, from 12:00 to 16:30
First part of exercise (12:00 – 15:30) will be performed at the Classroom A (group I) and Classroom B (group II), while the rest (15:30 – 16:30) will be held at Classrooms C (group I) and Classroom D (group II)

Seminars and **Lectures** will be available asynchronously in an online environment, in form of prerecorded lectures and other accompanying materials posted on the Moodle platform.
In the column listing seminars and lectures, you will find the professor's contact e-mail address provided in parentheses next to their name. You may use this **e-mail address**, if necessary, to arrange **consultations** (online or *in person*) regarding specific subject areas covered during the lectures or seminars.

WEEK	SEMINARS and LECTURES *Online on Moodle*	EXERCISES *in person*
WEEK 1 (30.06-04.07.2025)	**Seminar 9.** Homeostatic mechanisms underlying arterial blood pressure maintenance **dr S. Mazić, Full Professor** (sagabgyu@yahoo.com) **Lecture:** **Physiology of the circulation** (8 hrs) **dr J. Jakovljević Uzelac, Assistant Professor – 6hrs** (jovanavjakovljevic@gmail.com) **dr S. Mutavdžin Krneta, Assistant Professor – 2hrs** (slavica.mutavdzin@gmail.com)	**Exercise 14. Physiology of circulation 1** 1. Palpation of arterial pulse oscillations on various sites of the body 2. Estimation of radial artery pulse qualities in humans 3. Recording and analysis of arterial pulse oscillations (sphygmogram) 4. Measurement of velocity of fluid flow (ml/min) on the various models of piezometer 5. *Video presentation of vascular system* (*A.D.A.M.*) 6. *Principles of hemodynamics* (*PhysioEx 4.0*): *Measurement of blood flow* (*ml/min*) *under condition of changes in the blood vessel radius, viscosity of blood, length of the blood vessel and pressure gradient* **Exercise 15. Physiology of circulation 2** 1. Measurement of arterial blood pressure using palpatory and auscultatory methods in human 2. Demonstration of the effects of hydrostatic pressure and the role of venous valves on venous blood flow 3. Explanation of oculocardiac reflex 4. Assessment of functional capacity of the heart and circulation during physical activity in human (Lorentz and Harvard step tests) **July 01, 2025** **Group I: dr R. Jeremić, Assistant Professor; lab. M. Diković** **Group II: dr D. Todorović, Assistant Professor; lab. M. Diković**

WEEK 2 (07-11.07.2025)	**Seminar 10.** Circulation through special regions: cerebral, coronary, skeletal muscles, and skin circulation **dr A. Rašić Marković, Full Professor** (aleksandra.rasic-markovic@med.bg.ac.rs) **Lecture:** **Blood physiology** (6hrs) **dr A. Rašić Marković, Full Professor** (aleksandra.rasic-markovic@med.bg.ac.rs)	**Exercise 15. Physiology of circulation 2 - continuation** 5. *Interactive presentation of the experiment: the direct measurement of arterial blood pressure and influence of vasopressor and vasodepressor agents on the value of arterial blood pressure*, 6. *Interactive videosimulation of the effects of vasoactive substances on the isolated blood vessel* **Exercise 16. Blood cells on smear stained by Pappenheim's method** 1. Obtaining of blood samples for laboratory analysis from the finger tip 2. Preparation and staining of the blood smear by Pappenheim's method 3. Identification of blood cells 4. Determination of erythrocyte sedimentation rate (ESR) **July 08, 2025** **Group I: dr D. Todorović, Assistant Professor; lab. J. Despotović** **Group II: dr N. Šutulović, Assistant Professor; lab. J. Despotović**
WEEK 3 (14-18.07.2025)	**Seminar 11.** Hemostasis **dr M. Đelić, Associate Professor** (marina.djelic@med.bg.ac.rs) **Lecture:** **Kidney physiology** (6 hrs) **dr Z. Kojić, Full Professor** (zvezdana.kojic@med.bg.ac.rs)	**Exercise 18. Blood groups** 1. OAB blood typing on the slide and in test tubes 2. Rh typing (RhD) Performing of cross matching reaction and direct Coombs' test **Exercise 17. Erythrocytes** 1. Determination of red blood cell count by haemocytometer and erythrocyte suspension optical density 2. Hematocrit (Htc) or Packed Cell Volume (PCV) determination (microhematocrit method) 3. Hemoglobin determination 4. Calculation of the mean corpuscular values (MCV, MCH, MCHC) using the former obtained values **July 15, 2025** **Group I: dr D. Todorović, Assistant Professor; lab. B. Ranković** **Group II: dr N. Šutulović, Assistant Professor; lab. B. Ranković**
WEEK 4 (21-25.07.2025)	**Seminar - Chemistry in medical physiology**: Acid – base balance. Body chemical buffers **Department of Medical chemistry** **Lecture:** **Respiratory physiology** (8 hrs) **dr I. Pantić, Associate Professor** (igor.pantic@med.bg.ac.rs)	**Exercise 16. Blood cells on smear stained by Pappenheim's method - continuation** 4. Determination of reticulocyte count staining a slide using brilliant cresyl blue stain **Exercise 19. Leukocytes** 1. Determination of white blood cell count 2. Determination of differential white blood cell count 3. Calculation of absolute white blood cell count 4. *Interactive video presentation of homeostasis of body electrolytes* (*A.D.A.M.*) – repetition **July 22, 2025** **Group I: dr R. Jeremić, Assistant Professor; lab. M. Diković** **Group II: dr N. Šutulović, Assistant Professor; lab. M. Diković**

WEEK 5 (28.07-01.08.2025)	**Seminar 12.** Role of the kidneys in the regulation of extracellular fluid volume and composition. Kidney hormones **dr D. Nešić, Full Professor** (dejan.nesic@med.bg.ac.rs) **Lecture:** **Acid - base balance** (2hrs) **dr S. Mutavdžin Krneta, Assistant professor** (slavica.mutavdzin@gmail.com) **Physiology of the gastrointestinal system** (6 hrs) **dr D. Nešić, Full Professor - 4hrs** (dejan.nesic@med.bg.ac.rs) **dr S. Mutavdžin Krneta, Assistant professor - 2 hrs** (slavica.mutavdzin@gmail.com)	**Exercise 20. Platelets and haemostasias** 1. Determination of platelet count by Fonio (indirect method) 2. Determination of platelet count by hemocytometer method 3. Determination of bleeding time – Duke's method 4. Determination of blood coagulation time – Bürker method 5. Determination of prothrombin time (PT) **Exercise 21. Renal function tests** 1. Calculation of the clearance of inulin, creatinine and para-aminohippuric (PAH) acid 2. Calculation of GFR in dependence on changed values of renal blood flow (RBF), hydrostatic pressure (HP) and colloid-osmotic pressure (COP) 3. Calculation of diuresis in dependence on osmotic load of the kidneys (osmolar clearance and "free water clearance" 4. *Interactive video simulation of function of the nephron* (*PhysioEx 4.0*): *studying the effect of factors that affect glomerular filtration rate, volume and osmolality of final urine* 5. *Interactive video presentation of functions of the urinary tract* (*A.D.A.M.*) **July 29, 2025** **Group I: dr J. Maričić, Teaching Assistant; lab. J. Despotović** **Group II: dr N. Šutulović, Assistant Professor; lab. J. Despotović**
WEEK 6 (04-08.08.2025)	**Seminar 13**. Regulation of respiration **dr S. Mutavdžin Krneta, Assistant professor** (slavica.mutavdzin@gmail.com) **Lecture:** Energetics and metabolism (4 hrs) **dr J. Jakovljević Uzelac, Assistant Professor - 3hrs** (jovanavjakovljevic@gmail.com) **dr I. Pantić, Associate professor - 1 hr** (igor.pantic@med.bg.ac.rs)	**Exercises 22. Physiology of the respiratory system - tests of pulmonary function** 1. Demonstration of the role of the diaphragm in respiration (Donders' model) 2. Spirometry: determination of the static lung volumes and capacities 3. Performing of the ergometric step-test and indirect determination of the maximal oxygen consumption (VO_2max) **Exercise 23. Basic physical examination of the lungs: inspection, palpation, percussion and auscultation** 1. Auscultation of breathing **Exercise 24. Dynamic spirometry and CPR** 1. Spirometry: measuring dynamic lung volumes: FEV_1, the maximal voluntary ventilation (MVV), and recording of the flow-volume curve **August 05, 2025** **Group I: dr J. Maričić, Teaching Assistant; lab. B. Ranković** **Group II: dr D. Todorović, Assistant Professor; lab. B. Ranković**

WEEK 7 (11-15.08.2025)	**Seminar 14.** Glucose homeostasis: hormonal regulation of glycemia **dr M. Đelić, Associate Professor** (marina.djelic@med.bg.ac.rs)	**Exercise 23. Basic physical examination of the lungs: inspection, palpation, percussion and auscultation - continuation** 2. *Interactive video simulation of alveolar ventilation* (*PhysioEx 4.0*): *a. measuring respiratory volumes and capacities* (*simulating spirometry*) *b. examining the effect of changing airway resistance, the action of surfactant and the effect of changing intrapleural pressure on the lung functions* *c. analysis of the effect of various breathing patterns on PCO_2 values in the alveolar air and blood* *Interactive video presentation of functions of the respiratory system* (*A.D.A.M.*) **Exercise 24. Dynamic spirometry and CPR – continuation 1** 2. Cardiopulmonary resuscitation: basic principles of performing CPR by various methods (practicing on a model) **Exercise 25. Energetic metabolism (intensity) and balance in the diet** 1. Calculation of the basal metabolic rate (BMR) for students 2. Calculation of the daily energy turnover in students 3. Assembling of the nutritious meal on the basis of the determined turnover of the energy 4. *Interactive video session of the gastric antrum contractile response(SimVessel)*: *demonstration of the effects of substances that affect the spontaneous activity and the effect of passive stretching* 5. *Interactive video presentation of gastrointestinal system (A.D.A.M.)* **August 12, 2025** **Group I: dr J. Maričić, Teaching Assistant; lab. M. Diković** **Group II: dr D. Todorović, Assistant Professor; lab. M. Diković**
	Lecture: **Physiology of nutrition** (2hrs) **dr S. Mazić, Full Professor** (sagabgyu@yahoo.com) **Thermoregulation** (2hrs) **dr P. Brkić, Full Professor** (predrag.brkic@med.bg.ac.rs)	

WEEK 8 (18-22.08.2025)	**Seminar 15.** Food intake regulation and hormones of the gastrointestinal system. Physiological roles of the liver **dr I. Pantić, Associate professor** (igor.pantic@med.bg.ac.rs) **Lecture:** **Introduction to endocrinology and neuroendocrine integration: hypothalamic-hypophysial system** (2 hrs) **dr Z. Kojić, Full Professor** (zvezdana.kojic@med.bg.ac.rs) **Physiology of endocrine glands** (2 hrs) **dr Z. Kojić, Full Professor – 2 hrs** (zvezdana.kojic@med.bg.ac.rs)	**Exercise 24. Dynamic spirometry and CPR – continuation 2** 3. *Interactive video presentation of acid-base balance* (*A.D.A.M.*) 4. *Acid-base balance – computer simulation* (*PhysioEx 4.0*): *demonstration of buffering action of the lung and the kidney in acid-base homeostasis* (*compensation of acidosis and alkalosis*) **Exercise 26. Physiology of the endocrine system** 1. Assessment of the oral glucose tolerance test (OGTT) 2. *Interactive video simulation of the endocrine system physiology* (*PhysioEx 4.0*): a. *determination of rat's basal metabolic rate and demonstration of the effects of thyroxine, TSH and propylthiouracil on the rat's basal metabolic rate* b. *demonstration of the effect of estrogen on the morphological and functional characteristics of the uterus* c. *measurement of plasma glucose concentration using spectrophotocolorimetric method and demonstration of the effect of insulin on glucose concentration in the blood* *VIRTUAL PATIENT: assessment of disturbed homeostatic variables in* ("*SimBioSys Physiology*") **August 19, 2025** **Group I: dr J. Maričić, Teaching Assistant; lab. J. Despotović** **Group II: dr D. Todorović, Assistant Professor; lab. J. Despotović**
WEEK 9 (25-29.08.2025)	**Seminar 16.** Calcium and magnesium homeostasis; bones physiology **dr M. Đelić, Associate professor** (marina.djelic@med.bg.ac.rs) **Lecture:** **Physiology of endocrine glands** (6 hrs) **dr D. Nešić, Full Professor – 6 hrs** (dejan.nesic@med.bg.ac.rs)	**Exercise 27. Physiology of the female reproductive system** 1. Examination of vaginal smear cytological features in the time course of menstrual cycle 2. Early diagnosis of the pregnancy: laboratory tests 3. Analysis of the blood cells (number of cell types, ESR, and mean corpuscular values) in a.physiological conditions 4. Analysis of the plasma composition in physiological conditions 5. Analysis of the urine composition in physiological conditions **August 26, 2025** **Group I: dr J. Maričić, Teaching Assistant; lab. B. Ranković** **Group II: dr R. Jeremić, Assistant Professor; lab. B. Ranković**

WEEK 10 (01-05.09.2025)	**Seminar 17.** The women reproductive lifecycle and reproductive functions **dr S. Mazić, Full Professor** (sagabgyu@yahoo.com)	Make-up of exercises and seminars. **Details regarding Colloquium II and Colloquium III will be published in due course.**
	Lecture: **Physiology of reproductive system** (4 hrs) **dr A. Rašić Marković, Full Professor** (aleksandra.rasic-markovic@med.bg.ac.rs) **Acute and chronic adaptation to physical activity** (2 hrs) **dr S. Mazić, Full Professor** (sagabgyu@yahoo.com)	