Faculty	Jagiellonian University Medical College, Faculty of Medicine
Department conducting the module	Chair of Physiology UJ CM
Education module	Human Physiology
Module code	
Language of instruction	English
Educational effects of the education module	**The aim of the module is**: acquiring knowledge of the functions of a human organism and their control, and particularly familiarizing students with: - basics of bodily fluids and water-electrolyte balance of the organism, - notions of: solubility, osmotic pressure, isotonia, colloidal solution and Gibbs-Donnan equilibrium, - modes of intercellular and trans cellular communication and pathways of signal transmission in a cell - the physiology of skeletal and smooth muscles and the function of circulating blood, - basics of stimulation and conduction in the nervous system and higher nervous activities, as well as basics of activity of cerebral centers of sensory organs. - the laws of physics describing the flow of blood and gasses, factors influencing vascular resistance of the blood flow and resistance of gas flow in airways, - activities and regulation mechanisms of all organs and systems of a human body, including: muscular, circulatory, respiratory, alimentary, urinary, endocrine and integumentary systems, and understanding their interrelationships, - metabolic profiles of basic organs and systems, - acid-base equilibrium and the mechanisms of buffer action and their significance, - enzymes partaking in digestion, mechanisms of hydrochloric acid production in the stomach, pancreas activity, role of bile, the course of absorption of the products of digestion and disorders caused thereby, - mechanisms of food intake and consequences of malnutrition, including starvation, overeating and watching an ill-balanced diet, - action mechanisms of hormones, and consequences of disturbances in hormonal regulation, - the course and regulation of reproductive functions in women and men, - the basic quantitative parameters describing functions of particular systems and organs. - knows the body aging mechanisms; - describes changes in body functioning in states of homeostasis disturbances, and, in particular, specifies its integral response to physical strain, exposure to high and low temperature, loss of blood or water, sudden verticalization, transition from sleep to awake;

	Upon completion of the course, the student's knowledge includes: - activities of the organism and their regulation, integration relations of the mechanisms regulating the functions of particular systems, and the basic methodology of function tests of organs and systems of the organism. **Student's skills include:** - deducing the relation between factors influencing sustaining the biological processes and physiological and pathophysiological changes, - ability to describe changes in the functioning of the organism experiencing homeostasis disorders, and particularly to determine its integrated response to physical effort, exposure to high and low temperatures, blood loss and water depletion, sudden assuming of erect position, proceeding from sleep to waking state, effects of stimulation of digestive glands and internal secretion, - performing simple function tests estimating an individual as a system of stable regulation (loading test, exercise test), - interpreting numerical data illustrating basic physiological variables, - explaining physiological basics of patient's medical examination.
Type of the education module (compulsory/ optional)	compulsory
Year of studies	1-6
Semester	1 and 2
Name and surname of the person(s) carrying out the	Prof. dr hab. Tomasz Brzozowski
Name and surname of the examiner(s) or person(s) granting credit for the course (if different from the person carrying out the module)	Prof. dr hab. Tomasz Brzozowski
Mode of execution	Lectures, classes, laboratories, seminars, colloquia
Pre-requisites	none
Type and number of hours of classes requiring direct involvement of an academic teacher and students, if the particular module includes this type of classes	136 hours of lectures 39 hours of laboratories
Number of ECTS points granted for the module	13
Balance sheet of ECTS points	Participation in lectures 136 hours Participation in laboratories 39 hours Preparation for classes and examination 215 hours
Applied didactic methods	16 practical classes and seminar - 3 hours per week, and lectures – 5 hours per week
Methods of testing and evaluating the effects of training gained by students	Written and oral system of continua evaluation in class and seminars, and written colloquia on the covered material. The module finishes with a marked written examination.
The form and terms of obtaining credits for the module, the rules of allowing students to sit an exam, and crediting,	**Passing the module requires:** -credit requirements: for credit: 4 mid-exams in total, 3 exams

as well as the form and rules of obtaining credit for separate classes included in the particular module	successfully passed out of 4 for subject grade: year progress and Final Exam passed. -attendance requirements: 3 absences allowed per academic year -type of the final exam: MCQ test- -retake information: MCQ test
Contents of the education module	Curriculum: 1). **General physiology** internal environment of the organism, cell activity control, membrane transports, membrane rest potential and action potentials of excitable cells, action potential propagation, neuromuscular junction, synaptic phenomena, skeletal muscles, muscular tone, smooth muscles, skeletal and smooth muscle contractions and the mechanisms of their regulation, muscle weakness, autonomous nervous system. 2). **Neurophysiology**: organization of the nervous system, sensory receptors and sensory axis, motor neurons of the spinal cord and brain stem, sensory and motor pathways controlling functions of the higher and lower Moto neurons of the spinal cord, motor cortex, subcortical nuclei, cerebellum, speech and brain speech centers, neural control of impulses, emotions, and the processes of sleep and waking state (consciousness), learning and memory, regulation of body temperature. Centers in the central nervous system responsible for sensibility, sense of Visio, vestibular system, sense of hearing, sense of smell and taste. Modern methods of diagnostics of the diseases of nervous system. 3). **Blood**: functions of blood, composition of plasma, and blood cells, haematopoesis, blood groups, blood clotting, immune system, fibrinolysis, lymphatic circulation. 4). **Physiology of the cardiovascular system**: principles of haemodynamics, electric activity of the heart muscle, electrocardiogram, mechanical activity of the heart muscle, cardiac cycle, regulation of the venous return to the heart and minute heart volume, arterial blood pressure and its regulation, capillary bed and its functions, systemic and local regulation of blood flow, cardiovascular reflexes, modern methods of examination of the cardiovascular system. 5). **Physiology of the respiratory system**: structure and function of the respiratory system, mechanics of breathing, spirometry, transportation of oxygen and carbon dioxide, gas exchange in lungs, control of breathing, methods of examination of the respiratory system, cardiopulmonary adaptation to exercise. 6). **Physiology of kidneys**: structure and functions of kidneys, renal blood flow and glomerular filtration, kidneys' participation in homeostasis, the processes of reabsorbtion in the proximal convoluted tubule, Henle's loop, distal convoluted tubule, connecting tubules, regulation of the osmolarity of systemic fluids and consequences of its disorders, renal regulation of potassium, calcium and magnesium levels in the organism, role of the kidneys in maintaining acid-base equilibrium. 7). **Physiology of the alimentary system**: regulation of food consumption, motor activity, secretion, digestion, and absorption in the alimentary tract, gastrointestinal hormones, mechanisms of intestinal transportation of electrolytes, water and digestion products, cerebro-visceral axis and methods of examining the alimentary system. 8). **Physiology of the endocrine system**: endocrine functions of hypothalamus, pituitary gland, thyroid gland, adrenal gland, pancreas, hormonal regulation of: systemic metabolism, calcium metabolism, body height, reproductive system, menstrual cycle, hormonal control of pregnancy and lactation process. Endocrine organs function tests, and the consequences of disorders in hormonal regulation.
Required textbooks and suggested, supplementary reading for the module	see booklist
Amount of hours, principles and form of apprenticeship, when the training program provides practice	-