



Distance learning (asynchronous)														
Summer Semester														
Direct (contact) education				17										
Online learning (synchronous)	10			18										
Online learning (asynchronous)														
TOTAL per year:														
Direct (contact) education				34										
Online learning (synchronous)	20			36										
Online learning (asynchronous)														
Educational objectives (max. 6 items) C1. To make student acquainted with issues of general physiology. C2. To make student acquainted with issues of detailed physiology. C3. Student should be able to discuss physiological processes in human body at the cell, organ and system level, and discuss relationship between functions of different systems. C4. Student should be able to have integrative approach to the human body in case of a change in the functioning of any system. C5. Student should be acquainted with numerical values of basic physiological variables. C6. Student should learn basic functional tests to assess functions of human body.														
Education result matrix for module/course in relation to verification methods of the intended education result and the type of class														
Number of course education result	Number of major education result	Student who completes the module/course knows/is able to			Methods of verification of intended education results (forming and summarising)	Form of didactic class <i>**enter the abbreviation</i>								
K 01	B.K 5	knows the principles of calcium and phosphate management;			oral exam; written/oral test; presentation; report	L; MC								
K 02	B.K 6	knows the role and importance of body fluids, including saliva;			oral exam; written/oral test; presentation; report	L; MC								
K 03	B.K 19	knows vital functions of a human body;			oral exam; written/oral test; presentation; report	L; MC								
K 04	B.K 20	knows neurohormonal regulation of physiological processes;			oral exam;	L; MC								



			written/oral test; presentation; report	
K 05	B.K 21	understands the principles of acid-base balance and oxygen and carbon dioxide transport in the body;	oral exam; written/oral test; presentation; report	L; MC
K 06	B.K 22	knows principles of metabolism and nutrition;	oral exam; written/oral test; presentation; report	L; MC
K 07	B.K 23	knows numerical value of basic physiological variables and interprets changes in numerical values.	oral exam; written/oral test; presentation; report	L; MC
S 01	B.S 1	is able to refer chemical phenomena to processes that occur in the oral cavity;	oral exam; written/oral test; presentation; report	L; MC
S 02	B.S 4	is able to relate chemical phenomena to oral processes;	oral exam; written/oral test; presentation; report	L; MC
Sc 01	6)	is ready to promote health-promoting behavior;		L; MC
Sc 02	7)	is ready to use objective sources of information;		L; MC
Sc 03	8)	is ready to draw conclusions from own measurements or observations;		L; MC
<p>** L - lecture; SE - seminar; AC – auditorium classes; MC – major classes (non-clinical); CC – clinical classes; LC – laboratory classes; SCM – specialist classes (magister studies); CSC – classes in simulated conditions; FLC – foreign language course; PCP practical classes with patient; PE – physical education (obligatory); VP – vocational practice; SS – self-study, EL – E-learning .</p>				
<p>Please mark on scale 1-5 how the above effects place your classes in the following categories: communication of knowledge, skills or forming attitudes: Knowledge: .5... Skills: 5... Social competences: ...5..</p>				
Student's amount of work (balance of ECTS points)				
Student's workload (class participation, activity, preparation, etc.)			Student Workload (h)	
1. Contact hours:			34	
2. Online learning hours (e-learning):			56	



3. Student's own work (self-study):	150
Total student's workload	240
ECTS points for module/course	7
Comments	
Content of classes (please enter topic words of specific classes divided into their didactic form and remember how it is translated to intended educational effects)	
<p>Lectures</p> <p>Winter semester: 5 X 2 hours Introduction to physiology. Homeostasis. Nervous system – part 1 Nervous system – part 2 Nervous system – part 3 Hormones</p> <p>Summer semester: 5 X 2 hours Cardiovascular system – cardiac muscle Cardiovascular system – vascular system Cardiovascular system - regulation Respiratory system Immunity</p> <p>Classes</p> <p>Winter semester:</p> <p>Homeostasis 4 hours - Definition of homeostasis, local and long-term mechanisms - Internal environment of human body; water areas, ion composition - Contribution of individual system in maintaining homeostasis - Dynamics of biological membrane, membrane transport</p> <p>Nervous system: Excitability 4 hours - Nervous system; function, organizing, pathways of signal conduction - Neuron: structure, types - Resting and action membrane potential - Conduction in a neuron - Synapse: structure, types, conduction in the synapse</p> <p>Nervous system: Sensory systems. Senses 4 hours - General properties of the sensory systems - Sensory receptors: features and criteria for division, signal transduction - Somatic senses: touch, temperature, proprioception, pain - Special senses: smell, taste</p> <p>Nervous system: Motor control system and brain functions 4 hours - Spinal cord: structure, properties of conduction, spinal reflexes - Muscle spindle - Pyramidal and extrapyramidal system – functions - Cerebellum: functional arrangement, role - Equilibrium</p> <p>Autonomic nervous system (ANS) 4 hours - Division of the ANS, - Neurotransmitters and receptors - Effectors of the ANS, neuromodulators - Control of the ANS by CNS - Autonomic reflexes - The ways of evaluation of ANS activity</p>	



Muscle physiology 4 hours

- Skeletal muscles: structure of sarcomere, neuromuscular junction, excitation-contraction coupling, types of skeletal muscles, types of contractions, sources of energy in skeletal muscles, factors determining the strength of contractions, mechanics of contractions.
- Smooth muscles: myocyte structure, contraction and relaxation mechanism, types of contractions, types of smooth muscles

Hormones 4 hours

- Types of hormones, regulating mechanisms of hormones secretion
- Hypothalamic and pituitary gland hormones, hypothalamic-pituitary axis thyroid gland hormones, adrenal gland hormones, sex hormones

Growth of bones and tissues. 4 hours

Hormonal regulation of growth: adrenal glucocorticoids, thyroid hormones, growth hormone.
The importance of calcium in the body, hormones that control calcium balance.

Metabolism. Hormones secreted by pancreas. Body Temperature regulation 3 hours

- Energy balance. Metabolism during fed state and fasted state. Measurement of metabolism.
- Function of endocrine pancreas; glucagon, insulin
- Mechanisms of body temperature regulation

Summer semester:

Physiology of cardiovascular system: Cardiac muscle 4 hours

- Physiological properties of cardiac muscle, regulation of heart activity
- Basics of ECG
- Cardiac cycle

Physiology of cardiovascular system: Vascular system 4 hours

- Cardiovascular functional differentiation,
- Principles of hemodynamics
- Blood pressure, heart rate, venous pressure

Physiology of cardiovascular system – regulation. Venous circulation. Capillary circulation 4 hours

- Blood flow regulation : local, nervous, reflex, hormonal
- Venous circulation
- Capillary circulation

Physiology of cardiovascular system: Blood flow in specific regions 4 hours

- Features and control mechanisms of circulation in specific regions: coronary circulation, cerebral circulation, pulmonary circulation, blood flow in the skin, visceral circulation, blood flow in the skeletal muscles

Respiratory system 4 hours

- Mechanics of respiration: ventilation, respiratory resistance, function of respiratory pathways
- Spirometry
- Exchange of gases in the lungs, gasometry
- Nervous and chemical control of respiration

Blood. Erythrocytes 4 hours

- Composition and functions of blood; Erythropoiesis
- Properties and functions of erythrocytes
- Hemoglobin: structure and properties , types of hemoglobin and combinations with gases
- Transport of gases in the blood

Blood: Leucocytes. Hemostasis 4 hours

- Leucocytes: types, functions
- Immunity
- Response to invading bacteria and viruses
- Hemostasis

Water-electrolyte balance. Physiology of the kidney 4 hours

- Kidney's functional anatomy



<ul style="list-style-type: none"> - Glomerular filtration, reabsorption and secretion in the kidneys. Assessment of renal function - measurement of renal clearance. - Micturition. - Water-electrolyte and acid-base balance of the body. - Vasopressin. Aldosterone. RAS system. <p>Digestive system. Function of the liver. 3 hours</p> <ul style="list-style-type: none"> - Regulation of food intake - Motility and secretion in the gastrointestinal tract and their regulation - Digestion and absorption of nutrients - Function of the liver 	
<p>Basic literature (list according to importance, no more than 3 items)</p> <p>1. Dee Unglaub Silverthorn, Human Physiology. An Integrated Approach.</p> <p>Additional literature and other materials (no more than 3 items)</p> <p>1. Guyton and Hall, John E. Hall, Textbook of Medical Physiology</p> <p>2. Wiliam F. Ganong, Review of Medical Physiology 22e</p>	
<p>Didactic resources requirements (e.g. laboratory, multimedia projector, other...)</p> <p>Computer lab, multimedia projector, TV with DVD player, daylight projector, blackboard, whiteboard, stationery, esthesiometer, TIP THERM device, neurological hammer, ECG unit, manometer, device for hemodynamic measurements, spring dynamometer, infrared thermometer, measuring tape, stethoscope, spirometer, pickflowmeter, hematological lancets, hematocrit centrifuge, hematocrit tubes, serum with antibodies, light microscope, microscope slides, tissue/lignin, Petri dish, didactic films, hydrogen breath test gauge, glasses with stearin, hollowed slides, pulsoximeter, stopwatch, body composition weight, metronome, ergospirometer</p>	
<p>Preliminary conditions (minimum requirements to be met by the student before starting the module/course)</p> <p>Student has knowledge of human anatomy, histology; knows the course of basic chemical reactions and biochemical processes taking place in the body.</p>	
<p>Conditions to receive credit for the course (specify the form and conditions of receiving credit for classes included in the module/course, admission terms to final theoretical or practical examination, its form and requirements to be met by the student to pass it and criteria for specific grades)</p> <p>Conditions required for getting credit for classes:</p> <ul style="list-style-type: none"> - attendance at all classes - obtaining at least a satisfactory grade from each partial test - obtaining at least a satisfactory grade from each semester, which is calculated from the average of all grades obtained in a given semester <p>Every absence from classes must be made up, including rector days and dean's hours (in this case, a form of presentation or essay prepared by the student as part of self-study is recommended).</p> <p>Conditions required for admitting the student to the final exam:</p> <ul style="list-style-type: none"> - Student is obliged to obtain credit for each semester. <p>Form of the final exam: oral final exam</p> <p>To be admitted to the final exam it is necessary to obtain at least a satisfactory grade for each semester according to the criteria given below:</p>	

Grade:	Criteria (only for courses/modules ending with an examination)
Very Good	if the average grade for the semester ranges from 4.76 - 5.0



(5.0)	
Good Plus (4.5)	if the average grade for the semester ranges from 4.26 – 4.75
Good (4.0)	if the average grade for the semester ranges from 3.76 – 4.25
Satisfactory Plus (3.5)	if the average grade for the semester ranges from 3.26 – 3.75
Satisfactory (3.0)	if the average grade for the semester ranges from 3.00 – 3.25

Grade:	Criteria (examination evaluation criteria)
Very Good (5.0)	if the obtained average of two positive grades is in the range of 4.75 - 5.0
Good Plus (4.5)	if the obtained average of two positive grades is in the range of 4.25 – 4.50
Good (4.0)	if the obtained average of two positive grades is in the range of 3.70 – 4.00
Satisfactory Plus (3.5)	if the obtained average of two positive grades is in the range of 3.25 – 3.50
Satisfactory (3.0)	if the obtained average of two positive grades is in the range of 3.00 – 3.25 or if the grade for the answer to one question is positive and the second one is unsatisfactory, a positive grade (3.0; 3.5; 4.0; 4.5; 5.0) is obtained for the answer to the third question
Unit realizing the subject	Department of Physiology
Unit address	ul. T. Chałubińskiego 10, 50-368 Wrocław
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Person responsible for module	Head of the Department of Physiology prof. dr hab. Beata Ponikowska
Coordinator	prof. dr hab. Beata Ponikowska
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List of persons conducting specific classes				
Full name	Degree/scientific or professional title	Discipline	Performed profession	Form of classes
Agnieszka Buldańczyk	dr n.med.	medicine	academic	classes, lectures



Bartłomiej Paleczny	dr n. o zdrowiu	health science	academic	classes, lectures
Agnieszka Siennicka	dr n. o zdrowiu	health science	academic	classes, lectures
Robert Skalik	dr n.med.	medicine	academic physician	classes, lectures
Rafał Seredyński,	dr biol.	biology	academic	classes, lectures
Małgorzata Wyciszkiewicz	dr mgr inż.	biotechnology	academic	classes
Adrianna Nowicka	mgr inż.	biotechnology	academic	classes

Syllabus developed by

Date of Syllabus development 22.09.2020

22.09.2020.

dr n. med. Agnieszka Buldańczyk

Signature of Head of teaching unit

prof. dr hab. Beata Ponikowska

Signature of Faculty Dean

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