Course description

Part 1

General information about the course	
1. Major of study: medicine	**2. Study level:** unified MSc **3. Form of study:** intramural
4. Year: III, IV	**5. Semester: VI, VII**
6. Course name: physiology	
7. Course status: required	
8. Course contents and assigned learning outcomes To provide a clear and thorough practical working knowledge of the physiology of major systems within the human body as well as to have students to apply this knowledge to problems and case studies relevant to clinical physiology. Learning outcomes / reference to learning outcomes indicated in the standards For knowledge – student knows and understands: B.W.1; B.W.2; B.W.3; B.W.5; B.W.7; B.W.17; B.W.20; B.W.21; B.W.22, B.W.23, B.W.24; B.W.25 For skills student can do: B.U.7, B.U.9, B.U.10, C.U.20 For social competencies student is ready to: notice and recognize own limitations and make self-assessment of educational deficits and needs; make use of objective sources of knowledge; formulate conclusions from own measures and observations; efficient cooperation with others	

9. Number of hours for the course	**120**
10. Number of ECTS points for the course	**9**

11. Methods of verification and evaluation of learning outcomes

Learning outcomes	Methods of verification	Methods of evaluation*
Knowledge	Grade credit – MCQ	*
Skills	Observation	*
Competencies	Observation	*

* The following evaluation system has been assumed:

Very good (5,0) – the assumed learning outcomes have been achieved and significantly exceed the required level
Better than good (4,5) – the assumed learning outcomes have been achieved and slightly exceed the required level
Good (4,0) – the assumed learning outcomes have been achieved at the required level
Better than satisfactory (3,5) – the assumed learning outcomes have been achieved at the average required level
Satisfactory (3,0) – the assumed learning outcomes have been achieved at the minimum required level
Unstatisfactory (2,0) – the assumed learning outcomes have not been achieved

Course description

Part 2

Other useful information about the course	
12. Name of Department, mailing address, e-mail: Department of Physiology, School of Medical Sciences in Katowice, 18 Medyków St., 40-752 Katowice; fzjkatpl@sum.edu.pl; mlaryszbrysz@sum.edu.pl	
13. Name of the course coordinator: Joanna Lewin-Kowalik	
14. Prerequisites for knowledge, skills and other competencies: Completing of pre-medical college; basic knowledge in science (biology, chemistry, physics)	

15. Number of students in groups	In accordance with the Senate Resolution
16. Study materials	Presentations prepared and provided by instructors Laboratory equipment indispensable for conducting practical classes
17. Location of classes	Lectures and seminars: rooms provided by Dean's Office Labs: lab room of Department of Physiology
18. Location and time for contact hours	Department of Physiology, room 514 Mondays 10.a.m.-1 p.m.

19. Learning outcomes

Number of the course learning outcome	Course learning outcomes	Reference to learning outcomes indicated in the standards
P_W01 / C_K01	Knows and understands water-electrolyte balance in biologic systems	B.W.1
P_W02 / C_K02	Knows and understands acid-base balance and mechanism of buffer action as well as their importance for homeostasis	B.W.2
P_W03 / C_K03	Knows and understands terms: solubility, osmotic pressure, isotonicity, Gibbs-Donnan equilibrium	B.W.3
P_W04 / C_K04	Knows and understands physical laws describing fluid flow and factors affecting blood flow resistance	B.W.5
P_W05 / C_K06	Knows and understands physicochemical and molecular basis of sensory organs function	B.W.7
P_W06 / C_K06	Knows and understands ways of communication between cells and between cell and extracellular matrix, as well as signaling pathways	B.W.17
P_W07 / C_K07	Knows and understands mechanism of excitation and conduction in nervous system as well as higher nervous functions, and physiology of striated muscles and functions of blood	B.W.20
P_W08 / C_K08	Knows and understands function and regulatory mechanisms of all human organs and systems, including circulatory, respiratory,	B.W.21

	alimentary, urinary and relationships between them	
P_W09 / C_K09	Knows and understands mechanism and regulation of reproduction in females and males	B.W.22
P_W10 / C_K10	Knows and understands mechanism of ageing	B.W.23
P_W11 / C_K11	Knows and understands basic quantitative parameters describing efficiency of particular systems and organs	B.W.24
P_W12 / C_K12	Knows and understands connection between factors disturbing balance of biological processes and physiologic and pathophysiologic changes	B.W.25
P_U01 / C_S01	Can conduct simple functional tests assessing human body as a stable regulation system (exercise and load tests) and interpret numerical data referring to the basic physiologic variables	B.U.7
P_U02 / C_S02	Can operate simple measuring instruments and assess the accuracy of performed measures	B.U.9
P_U03 / C_S03	Can use databases including internet ones and seek for information using available tools	B.U.10
P_U04 / C_S04	Can describe changes in body function in disturbance of homeostasis, especially its integrated response to physical effort, exposure to high or low temperature, loss of blood or water, sudden verticalization, transition from sleep to wake	C.U.20

20. Forms and topics of classes	**Number of hours**
21.1. Lectures	
Internal environment, homeostasis, body fluids	**2**
Acid-base balance	**1**
Blood	**1**
Excitability	**2**
Muscles	**2**
Heart	**4**
Circulation	**4**
Respiration	**4**
Metabolism	**1**
Thermoregulation	**1**
Gastrointestinal tract	**6**
Kidneys and urinary system	**6**
Hormones and endocrinal system	**4**
Reproductive system	**2**
22.2. Seminars	**1**
Internal environment, homeostasis, body fluids	**1**
Acid-base balance	**1**
Blood	**1**
Excitability	**1**
Muscles	**2**
Heart	**2**
Circulation	**3**
Respiration	**3**
Metabolism	**1**
Thermoregulation	**1**
Gastrointestinal tract	**3**
Kidneys and urinary system	**4**

Hormones and endocrinal system	**4**
Reproductive system	**2**
23.3. Labs	
Orientation class	**1**
Osmosis, surface tension, diffusion; basic calculations (osmolality, body fluids)	**2**
Hematocrit; calculations (acid-base balance, blood)	**2**
Blood typing - AB0 and Rh	**2**
Determining of amount of hemoglobin; different combinations of hemoglobin and oxygen;	**2**
ECG, electrical axis of the heart, Valsalva maneuver	**2**
Heart loop analysis; calculations and cases (heart)	**2**
Blood pressure and arterial pulse measurement; cases (cardiovascular system)	**2**
Calculations and cases (cardiovascular system)	**2**
Vital capacity; calculations (respiration)	**2**
RBC counting; influence of different solutions on erythrocytes; counting of leukocytes, differential white cells counting	**2**
Class in EaMSC – Virtual Physiology	**2**
Interactive Physiology	**2**
Measurement of physical efficiency in humans: Harvard test, Martinet test; Physical work capacity (W_{170}); $V_{O_2}max$	**2**
Basal metabolic rate (BMR) measurement; Body mass index (BMI) estimation; Assessment of work load; Water balance	**2**
ECG - repetition; Heart sounds - repetition; Blood pressure - repetition; Factors influencing arterial blood pressure and heart rate	**2**
Peripheral circulation: reactions of skin blood vessels, effect of venous congestion; Dermographism; Cases concerning cardiovascular system	**2**
Cases concerning GIT	**2**
Respiration - repetition: Vital capacity; Timed vital capacity - normal and after effort; Measurement of air peak flow; Voluntary apnea time; Cases concerning respiration	**2**
Vision: acuity, astigmatism, color blindness, visual field, ambiguous figures, blind spot;	**2**
Calculations and cases concerning “Kidneys and urinary tract”	**2**
Unconditioned reflexes in humans; Skin sensation: touch and pain sensation, touch discrimination; Deep sensation examination	**2**
Cases concerning endocrinal physiology	**2**
Class in EMSC – Patient Simulator	**2**
Hearing: auditory fatigue, acuity of hearing, tests acc. to Weber, Rinne, Schwabach; Examination of coordination	**2**
Problem solving; repetition	**1**

24. Readings

Physiology by Linda S. Costanzo

Review of Medical Physiology by William F. Ganong

Color Atlas of Physiology by Agamemnon Despopoulos & Stefan Silbernagl

Physiology labs manual for medical students by Joanna Lewin-Kowalik [Ed.]

25. Detail evaluation criteria

In accordance with the recommendations of the inspection bodies
Completion of the course – student has achieved the assumed learning outcomes
Detail criteria for completion and evaluation of the course are specified in the course regulations