STANDARD SYLLABUS OF SUBJECT
ACADEMIC YEAR 2012/2013

Syllabus						
Subject: Physiology		**Code of module** B				
Head of Department responsible for the subject: Professor Ludmiła Borodulin-Nadzieja						
Faculty of Medicine and Dentistry						
Level of Education:	Master degree					
Form of the studies	stationary					
Year of studies:	second	Semester of the studies: third and fourth				
Types of subject:	obligatory					
Language of lecturer:	English					
Name of Department in charge of the subject		Winter semester (hours)			Summer semester (hours)	
		Lecture	Classes	Seminar	Lecture	Classes	Seminar
Department of Physiology		15	45	-	-	60	-
Total:		15	45	-	-	60	-

The aims of the course in physiology

C1. Basic knowledge on mechanisms controlling human functions
C2.Interactions between physiologic and pathologic mechanisms
C3. Clinical application of human physiology

The effects of education

Number of Effect of education	Description of effect of education	Teaching verification methods	Form of teaching course:
B.W16	Metabolic profiles of basic organs and systems	Oral exam	W, Ć
B.W18	Digestive enzymes, mechanisms of chloric acid production,bile function, physiology of food absorption – dysfunction of food absorption in alimentary tract ;		

B.W20	Consequences of deficiency or excess of vitamins or minerals in human organism		
B.W24	Excitation and conduction in nervous system, superior nervous functions, muscle physiology, blood function ;		
B.W25	Functions and regulatory mechanisms of organs and systems in human body, including: circulation, respiratory system, alimentary system, urinary system, skin, interactions between the systems ;		
B.W26	Hormones –physiologic regulatory mechanisms, clinical consequences of hormonal dysfunction;		
B.W27	Reproductive functions in males and females;		
B.W29	Basic quantitative parameters that describe functions of particular organs and systems;		
B.W30	relationship between factors that dysregulate balance of biological processes and physiologic and pathophysiologic changes in human body;		
B.U7	human body response to changes in homeostasis (physical exercise, low and high temperature,sleep and awakeness, blood or water loss),		
B.U8	interpretation and application of simple functional tests (stress tests) and physiologic parameters.;		
W- Lecture; S- seminar; Ć- classes; EL- e-learning;			

Student's working time (balancesheet ECTS)	
Classes and lectures at University (hours) 120	
Extramural studies time (hours) 92	
Total	212
ECTS score	9
Suggestions	

Topics:

1. HOMEOSTASIS

   Negative and positive biofeedback, setpoint, viscious circle, regulatory mechanisms of human body systems

2. EXCITABILITY

   Types of stimuli, excitability, resting and active potential, law „ all or none event", conduction of active potential, depolarization and hyperpolarization, structure and functions of neuron and synapse, convergence, divergence.

3. NERVOUS SYSTEM – PART I perception – definitions, types of receptors, types of perception – nervous pathways, cortex centers of perception, senses - visual tract, auditory tract, olfactory tract, taste, balance

4. NERVOUS SYSTEM - PART II

   Physiology of spinal cord - afferent and efferent pathways, spinal reflexes, examination of reflexes, the effect of central nervous system on activity of spinal cord, physiology of medulla oblongata and pons, functions of pyramidal and extrapyramidal tracts, functions of cortex, physiology of reticular formation, electrical function of brain during sleep and awakeness, physiological sleep, conditional reflexes.

5. AUTONOMIC NERVOUS SYSTEM

   The anatomical and functional division of autonomic nervous system, transmitters of vegetative system, nervous endings, cell receptors, second messengers, synaptic transmission in sympathetic ganglia, the effect of autonomic nervous system on organs , autonomic reflexes

6. MUSCLE PHYSIOLOGY

   Structure of skeletal muscles, innervation of skeletal muscles, neuromuscular synapse, active potential and mechanism of skeletal muscle contraction, types of contractions, smooth muscles : structure, innervation, active potential, contracture, morphological and physiological differences between smooth and skeletal muscles.

7. HORMONES – PART I

   Characteristics and controlling mechanisms of endocrine system, differences and similarities between nervous system and hormonal system, mechanisms of hormones' effect on tissues, hypothalamic hormones, pituitary gland hormones, thyroid gland hormones

8. HORMONES – PART II

Hormones of suprarenal glands, pancreas – regulation of secretion and effect on organs, calcium-phosphate economy – hormonal regulation

9. RENAL PHYSIOLOGY

Functions of nephron, glomerular filtration, tubular transportation, clearance, urine densification and dilution mechanisms- countercurrent multiplier, role of kidney in regulation of water-electrolyte balance and acid – base balance, endocrine function of kidney

10. GASTROINTESTINAL TRACT

The motoric and exocrine function of alimentary tract, digestion and absorbtion of nutrients, role of particular parts of alimentary tract in digestion and absorbtion, vegetative innervation of alimentary tract, evaluation of secretory function of stomach (MAO , BAO, ph of acid juice), pancreas, small intestine, role of pancreas and gallbladder, endocrine function of gastrointestinal tract

11.BLOOD PHYSIOLOGY – PART I

Content of blood , physical and chemical properties of blood, functions of blood, content of plasma, functions of plasma

12.BLOOD PHYSIOLOGY – PART II

Structure and function of erythrocyte, hemoglobin, hemolysis, osmotic resistance, hematocrit

13.BLOOD PHYSIOLOGY – PART III

Erythrocyte sedimentation rate, blood types, physiology of leucocytes, immunological response

14.RESPIRATORY SYSTEM part I

Mechanics of respiration, phases of respiration, lung volumes, intrapleural pressure , spirometry, Tiffenau index, lung compliance, respiratory output.

15.RESPIRATORY SYSTEM part II

Gas exchange in lungs, regulation of respiration, physical examination of respiratory system.

16.CARDIOVASCULAR SYSTEM – PART I

Functions of cardiovascular system, functional division of cardiovascular system, physiological properties of heart muscle, resting potential and active potential of heart muscle, conduction of active potential in heart, effect of calcium and potassium ions on heart function, effect of heart rate and rhythm of stimuli on heart function, relationship between heart contraction force and rhythm of stimuli, Starling law, regulation of heart function.

17.CARDIOVASCULAR SYSTEM - PART II

Heart physiology, mechanical function of heart, heart cycle, heart tones, cardiac output, electrocardiography, exercise testing, physical examination of heart

18.CARDIOVASCULAR SYSTEM - PART III

Blood pressure, regulation of blood pressure, pulse and its traits, measurement of blood pressure, examination of pulse

19.CARDIOVASCULAR SYSTEM - PART IV

Blood vessel physiology, regulation of blood vessel tension, capillary circulation, venous circulation, specific properties of particular vascular systems: cerebral circulation, visceral circulation, renal circulation, pulmonary circulation, skeletal muscle circulation, coronary circulation.

20.Adaptation of circulatory system to environmental changes (exercise, hot and cold microclimate)

21.METABOLISM, THERMOREGULATION, SKIN PHYSIOLOGY

Basic metabolism , rules of nutrition, vitamins, mechanisms of thermoregulation

22.Exercise Physiology, regulatory mechanisms in physiology

Literature : Guyton. Textbook of Medical Physiology
Silverthorn. Human Physiology. Integrated Approach.
Elaine N. Marieb. Human Anatomy and Physiology Laboratory Manual. Eighth Edition

Educational tools:
Virtual Physiology Laboratory, multimedia projector, scripts, microscopes, multimedia programs for classes and lectures

Credit: quizzes ,tests including particular topics , final exam

Name and address of Department in charge of the subject (tel./email):

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…Department of Physiology 71-784-00 -91
……robert.skalik@am.wroc.pl……..……

Person in charge of curriculum

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dr n.med. Robert Skalik

Signature of Head of Department **Signature of Dean**

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Date: ……