SUBJECT : General Medicine
YEAR OF EDUCATION: II.
TERM: Winter
STUDY BRANCH: physiology
LECTURES
NUMBER OF TEACHING HOURS PER WEEK:

1\textsuperscript{st} teaching week:
- Introduction to physiology, meaning of physiology
- Homeostasis, the body fluids

2\textsuperscript{nd} teaching week:
- Blood: functions, properties, composition
- Blood groups, blood clotting

3\textsuperscript{rd} teaching week:
- The respiratory system and its functions
- Mechanics of the breathing

4\textsuperscript{th} teaching week:
- Ventilation, diffusion, perfusion, exchange of the respiratory gases
- Hypoxia, control of the breathing

5\textsuperscript{th} teaching week:
- Cardiovascular system, myocardial properties
- Electrophysiology of the heart

6\textsuperscript{th} teaching week:
- The heart cycle
- Manifestations of the heart activity

7\textsuperscript{th} teaching week:
- Heart work, metabolism, source of energy
- Control of the heart activity

8\textsuperscript{th} teaching week:
- Biophysical considerations of circulation
- Hemodynamics in the high-pressure vessel system

9\textsuperscript{th} teaching week:
- Haemodynamics in the low-pressure vessel system
- Peculiarities of the haemodynamics in some organs

10\textsuperscript{th} teaching week:
- Control of the blood volume
- Control of the blood pressure

11\textsuperscript{th} teaching week:
- Physiology of the kidneys, morphology, innervation
- Renal processes, functional tests

12\textsuperscript{th} teaching week:
- Gastrointestinal functions, digestion
- Absorption in GIT

**13th teaching week:**
- Regulation of gastrointestinal functions
- Thermoregulation

**EXERCISE**

**NUMBER OF TEACHING HOURS PER WEEK: 4**

**1st teaching week:**
- Subject matter of physiology
- System of teaching of physiology, criteria for credit and exams
- Safety in the laboratory - safety instructions for students
- Instructions to the practical lessons
- Principles of the experimental work – methods, observation
- Fundamentals of statistics in physiology, utility of computers in physiology

**2nd teaching week:**
- Physiological principles
- Cell membranes, membrane receptors
- Body fluids - compartments, measurement
- Exchange of substances between cell and external environment
- Homeostasis
- Manners of blood samples taking
- Proof of the blood
- Determination of hematocrit value
- Erythrocyte sedimentation rate and factors of the sedimentation
- Determination of haemoglobin content, derivates of haemoglobin

**3rd teaching week:**
- Blood
- Osmotic fragility of red blood cells
- Determination of the red blood cell count
- Determination of the white blood cell count
- Red blood cell values

**4th teaching week:**
- The respiratory system and its functions
- Non-respiratory functions of the respiratory system
- Mechanics of breathing
- Blood smear, differential leucocyte count, Hynk nuclear number
- Blood groups determination
- Determination of the Rh-factor

**5th teaching week:**
- The exchange of the respiratory gases
- Gases properties, place and mechanisms of the gases transport
- Exchange of gases, transport of the respiratory gases between lungs and tissue
- Exchange of gases in the tissue
- Determination of the platelets count
- Blood clotting time
- Bleeding time
- Quick test
- Examination of the activated partial thromboplastin time (APTT)

**6th teaching week:**
- Regulation of the respiratory activity (nervous, chemical, reflex and suprapontine mechanisms)
- Adaptation of respiration on the changed conditions (hypoxia, hypeoxia, hyperbaria)
- Model of breathing—modelling of the inspiration and expiration
  Muller manoeuvre
  Valsalva manoeuvre
- Spirography – testing by VOLUMETEST
- The O₂ and CO₂ influences on the breathing
- Voluntary apnoe

7th teaching week:
- The basic properties of the myocardium
- Excitation and conduction of the heart impulse
- The heart contraction and its energetics
- Percussion and auscultation of the lungs
- EUTEST
- Peak Flow Meter
- Computer spirography

8th teaching week:
- Heart cycle
- Mechanical events of the heart activity
- Electrophysiology of the heart
- Evaluation of ECG

9th teaching week:
- Control of the heart activity
- Intracardial mechanisms
- Extracardial mechanisms
- Percussion and auscultation of the heart
- Phonocardiography
- Examination of arterial pulse
- Systolic time intervals

10th teaching week:
- Blood circulation – physical considerations
- Haemodynamics in the high-pressure system
- Haemodynamics in venous and capillary network
- Autonomous reflexes acting on the heart

11th teaching week:
- Organ haemodynamics
- Control of the blood volume and blood pressure
- Measurements of the blood pressure
- Computer model of the blood pressure
- Electronic model of the blood pressure
- Model of the blood vessel elasticity
- Resistance of blood capillaries

12th teaching week:
- Renal physiology
- Urine examination - density, pH, proteins, glucose
- Urine examination: ketone bodies, bile stains, blood, pus
- Quantitative examination of the native sediment
- Qualitative examination of the stained sediment
- The renal functional tests
13th teaching week:
- Digestive system
- Evaluation of the practical lessons
- Credits

TERM: Summer
LECTURES
NUMBER OF TEACHING HOURS PER WEEK: 3

1st teaching week:
- General neurophysiology
- Synaptic transmission, receptors

2nd teaching week:
- Somestetic analysator
- Vision

3rd teaching week:
- Hearing
- Vestibular functions

4th teaching week:
- Control of the somatic functions by spinal cord
- Control of the somatic functions by brain stem

5th teaching week:
- Control of the somatic functions by cerebellum and basal ganglia
- Peripheral autonomic nervous system

6th teaching week:
- Hypothalamus
- Integrative functions of formatio reticularis and thalamus

7th teaching week:
- Integrative functions of limbic system and cerebral cortex
- Manifestation of cerebral activity. Vigility and sleep

8th teaching week:
- Higher nervous activity
- Learning, memory, speech

9th teaching week:
- Endocrinology, basis of the hormonal integration and regulation
- Thyroid gland, parathyroid glands

10th teaching week:
- Endocrine functions of medulla and suprarenal cortex
- Regulation of carbohydrate metabolism, pancreas

11th teaching week:
- Gonads, reproductive system
- The pituitary gland, hypothalamic relationships

12th teaching week:
- Nonspecific endocrine glands
- Physiology of the skeletal muscle

13th teaching week:
- Physiology of the smooth muscle
- Physiology of exercise

14th teaching week:
- Biorythms
- Physiology of the childhood, stress

**TERM: Summer**

**EXERCISES**

**NUMBER OF TEACHING HOURS PER WEEK: 5**

**1st teaching week:**
- Safety in the laboratory
- Organizational instructions the practical lessons
- Thermoregulation
- Physiology of the digestion
- Demonstration of digestive activity of ptyalin
- Examination of the gastric juice
- Menu
- Measurement of the body temperature
- Function of sweat glands and neutralization ability of the skin

**2nd teaching week:**
- General neurophysiology
- Model of the analogic and functional connection of the neurons
- Cutaneous sense
- Weber’s fallacies
- Purkinje image test
- Astigmatism
- Flicker

**3rd teaching week:**
- Receptors
- Somestetic analysator
- Proprioreceptive analysator
- Ophthalmoscopy
- Examination of the visual acuity (visus)
- Examination of the visual field (perimetry)
- Colour vision
- Colour mixture

**4th teaching week:**
- Vision
- Determination of near and far points
- Binocular vision
- Reversibles figures and optic fallacies
- Otoscopy
- Examination of the hearing by whispered words
- Examination of the hearing by tuning forks

**5th teaching week:**
- Hearing
- Statokinetic receptors
- Cutaneous, deep and visceral sensation
- Demonstration – irritation of vestibular apparatus of animal
- Examination of vestibular apparatus
- Location of the taste
- Smell
  - Film: Examination of vestibular apparatus
6th teaching week:
- Control of somatic functions
- Examinations of somatic – exteroceptive reflexes of man
- Examinations of somatic – proprioceptive reflexes of man
- Postural and upright reflexes of rabit

7th teaching week:
- Vegetative nervous systém
- Hypotalamus
- Examination of function of cerebellum
- Examination of vegetative reflexes of man
- Measurement of the reaction time
- Bilateral transfer

8th teaching week:
- Integrative and associative functions of CNS
- Manifestation of cerebrum functions
- Electronic model of sleep
- Model of the conditioned salivary reflex
- Memory testing by Melli method
- Associative test

9th teaching week:
- Higher nervous activity – reflexes, the first signaling systém, learning and memory
  - Dynamometry
  - Ergography
  - Ergometry

10th teaching week:
- Basal functions of gonadal glands
- Thyreoid gland
- Parathyreoid glands
- Krestovnik´s test
- Lian´s test
- Ruffier´s test
- Test of the maximal expiratory force
- Burger´s test

11th teaching week:
- Adrenal medulla and cortex
- Pancreas
- Gonadal glands, gravidity
- Glucose – loading test
- Functions kidney test
- Test of gravidity
- Basal metabolism
- Ca – test (Chvostekov)
- Measurement of the basal metabolic rate

12th teaching week:
- Hypophysis
- Others hormon
- The practical repeating of the rigorous practical lessons

13th teaching week:
- Muscle physiology
- The practical repeating of the rigorous practical lessons
14th teaching week:
- Problematic questions from physiology
- Exam from the rigorous practical lessons
- Credit

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