



Department of Human Physiology

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<http://www.upjs.sk/en/faculty-of-medicine/institutes/department-of-human-physiology>

SUBJECT : Dental Medicine

YEAR OF EDUCATION: II.

TERM: Winter

STUDY BRANCH: physiology

LECTURES

NUMBER OF TEACHING HOURS PER WEEK:

1st teaching week:

- Introduction to physiology, meaning of physiology
- homeostasis, the body fluids

2nd teaching week:

- Blood: functions, properties, composition
- Blood groups, blood clotting

3rd teaching week:

- The respiratory system and its functions
- Mechanics of the breathing

4th teaching week:

- Ventilation, diffusion, perfusion, exchange of the respiratory gases
- Hypoxia, control of the breathing

5th teaching week:

- Cardiovascular system, myocardial properties
- Electrophysiology of the heart

6th teaching week:

- The heart cycle
- Manifestations of the heart activity

7th teaching week:

- Heart work, metabolism, source of energy
- Control of the heart activity

8th teaching week:

- Biophysical considerations of circulation
- Hemodynamics in the high-pressure vessel system

9th teaching week:

- Haemodynamics in the low-pressure vessel system
- Peculiarities of the haemodynamics in some organs

10th teaching week:

- Control of the blood volume
- Control of the blood pressure

11th teaching week:

- physiology of the kidneys, morphology, innervation
- Renal processes, functional tests

12th teaching week:

- Gastrointestinal functions, digestion

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

EXERCISE

NUMBER OF TEACHING HOURS PER WEEK: 3

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, derivatives 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, Hink 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, hyperoxia, hyperbaria)
- Model of breathing- modelling of the inspiration and expiration
 - Muller manoeuvre
 - Valsalva manoeuvre
- Spirography – testing by VOLUMEST
- The O₂ and CO₂ influences on the breathing
- Voluntary apnoea

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 spirometry

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:****1st teaching week:**

- General neurophysiology
- Synaptic transmission, receptors

2nd teaching week:

- Somesthetic analyser
- 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: 3

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
- Somesthetic analyser
- Proprioceptive analyser
- 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
- Reversible 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
- Localisation 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 rabbit

7th teaching week:

- Vegetative nervous system
- Hypothalamus
- 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 system, learning and memory
- Dynamometry
- Ergography
- Ergometry

10th teaching week:

- Basal functions of gonadal glands
- Thyroid gland
- Parathyroid 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
- Other hormones
- 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

Košice,

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