MINISTRY OF EDUCATION
UNIVERSITY OF MEDICINE AND PHARMACY
"CAROL DAVILA" - BUCURESTI
FACULTY OF MEDICINE

ANALYTICAL PROGRAMME
COURSES AND PRACTICAL ACTIVITIES

2021

UNIVERSITY OF MEDICINE AND PHARMACY
"CAROL DAVILA" - BUCURESTI
FACULTY OF MEDICINE

C E R T I F I C A T E

It is hereby certified that the graduate _____ _____ has attended during the period 2015-2021 the study programme **MEDICINE**, full-time education, language of study _____, according to the attached curriculum and analytical programme.

Chancellor,

Chief University Secretary,

Dean,

Chief Faculty Secretary,

MINISTRY OF EDUCATION

UNIVERSITY OF MEDICINE AND PHARMACY "CAROL DAVILA"- BUCURESTI
FACULTY OF MEDICINE

No. *No*	Name of subject *Subject*	Total hours / *Total Hours*		No. credits / *Number of ECTS credits*	
Year I (academic year 2015/2016) / *1st Year of study (academic year 2015/2016)*					
	***Required subjects* / Discipline obligatoire**				
1	Anatomy and embryology/Anatomy *and embryology*	56C	140L	7	7
2	Biophysics/Biophysica	28C	42L	4	-
3	General *and* medical biochemistry	70C	84L	5	5
4	Genetics/Genetics	28C	42L	5	-
5	Cell biology/Cell *biology*	28C	42L	-	7
6	Physiology/Physiology	42C	42L	-	7
7	Psychology *of* health *and* communication with the patient	14C	28L	3	-
8	Marketing and medical technology/Marketing *and medical technology*	14C	14L	-	2
9	English/Romanian (*English/Romanian)*	-	56S	-	4
10	Physical education/Physical *education*	-	56L	-	2
Year II (academic year 2016/2017) / *2nd Year of study (academic year 2016/ 2017)*					
	***Required* subjects / Discipline obligatoire**				
1	Anatomy and embryology/Anatomy *and embryology*	56C	84L	7	5
2	Histologie/Histology	56C	84L	6	6
3	Physiology/Physiology	84C	84L	6	6
4	Bacteriologie/Bacteriology	56C	56L	4	4
5	Medical informatics *and bios*tatistics	14C	28L	3	-
6	Sciences of human behavior / *The science of human behavior*	14C	28L	-	3
7	English/Romanian (*English/Romanian)*	-	56L	-	3
8	Physical education/Physical *education*	-	56L	-	3
Year III (academic year 2017/2018) / *3rd Year of study (academic year 2017/2018)*					
	***Required* subjects / Discipline obligatoire**				
1	Semiologie médicale/Medical *symptomatology*	56 C	112 L	8	8
2	Pharmacology/Pharmacology	56 C	56 L	-	8
3	Physiopathology/Pathophysiology	56 C	56 L	4	4
4	Immunology/Immunologie	56 C	-	-	3

No. *No*	Name of subject *Subject*	Total hours / *Total Hours*		No. Credits / *Number of ECTS credits*	
5	Anatomie patologică/Pathological *anatomy*	56 C	56 L	4	4
6	Hygiene/Hygiene	28 C	28 L	4	-
7	Parasitology/Parasitologie	14 C	14 L	2	-
8	Virusology/Virology	28 C	28 L	-	4
9	Medical *Ethics, Basics of Deontolology and Bio*ethics	14 C	14 LP	-	2
Year IV (academic year 2018/ 2019) / *4th Year of study (academic year 2018/2019)*					
	***Required* subjects / Discipline obligatoire**				
1	Cardiology/Cardiology	76 C	152 L	-	11
2	Pneumology *and* occupational diseases/Pneumology *and* thoracic surgery	66 C	132 L	10	-
3	Digestiv / *The digestive system*	46 C	92 L	7	-
4	Surgery/Surgery	76 C	152 L	-	11
5	Orthopedics and traumatology *Orthopedics and traumatology*	36 C	72 L	5	-
6	Paediatric surgery and paediatric orthopaedics / *Pulmonology and occupational diseases / Thoracic surgery*	26 C	39 L	-	3
7	Oncology *Oncology*	8 C	16 L	-	2
8	Radiology/Radiology	28 C	28 L	3	-
9	Methodology *of* scientific research/Methodology *of scientific research*	10 C	10 L	-	2
10	Clinical pharmacology/Clinical *pharmacology*	12 C	12 L	2	-
Year V (academic year 2019/ 2020) / 5*th* *Year of study (academic year 2019/2020)*					
	***Required* subjects / Discipline obligatoire**				
1	Rheumatology/Reumathology	36 C	72 L	-	6
2	Nephrology/Nefrology	36 C	54 L	5	-
3	Paediatrics and childcare/Pediatrics *and childcare*	76 C	152 L	12	-
4	Surgery/Surgery	56C	112 L	9	-
5	Neurology/Neurology	64 C	96 L	8	-
6	Urology/Urologie	26 C	39 L	-	4
7	Endocrinology/Endocrinologie	28 C	42 L	-	5
8	Diabetes/Diabetology	8 C	12 L	2	-
9	Public health/Public *health*	32 C	32 L	-	3
10	Toxicologie/Toxicology	16 C	16 L	2	-

Year VI (academic year 2020/ 2021) / 6th *Year of study (academic year 2020/2021)*					
***Required* subjects / Discipline obligatoire**					
1.	Infectious diseases/Infectious *diseases*	56 C	84L	-	8
2.	Epidemiology/Epidemiologie	12 C	12 L	2	-
3.	Oftalmologie/Ophthalmology	16 C	24L	3	-
4.	Psychiatry	36 C	54 L	-	6
5.	ENT/E.*N.T.*	26 C	39 L	4	-
6.	Dermatology/Dermatologie	26 C	39 L	4	-
7.	Obstetrics-Gynecology and Neonatology/Obstetrics-Gynecology *and Neonatology*	56 C	84 L	8	-
8.	Forensic medicine/Forensic *medicine*	16 C	24 L	3	-
9.	Medicina de familie/Family *medicine*	26 C	39 L	-	4
10.	Hematology/Hematology	26 C	39 L	4	-
11.	Physical and rehabilitation medicine/Physical *and rehabilitation medicine*	14 C	14 L	2	-
12.	Medical emergencies and first aid/Medical *emergencies and first aid*	20 C	20 L	3	-
13.	ATI/Anesthesiology *and Intensive Care*	12 C	12 L	2	-
14.	Plastic *and aesthetic* surgery, reconstructive microsurgery / *Plastic and esthetic surgery, reconstructive microsurgery*	16 C	24 L	-	3

Contents

Year I and Year II

Year I

Year II

Year III

Year IV

Year V

Year VI

Year I and Year II

ANATOMY AND EMBRYOLOGY

COURSE SYLLABUS AND PRACTICAL WORK
4 semesters (course 112 hours, practical work 224 hours)

Course

- Introduction. The subject of anatomy.
- Reproduction. Stages of embryogenesis. Types of reproduction. Pregnancy cycle - general characteristics of gametes.
- Meiosis. Reductional division. Equational division.
- Spermatogenesis. Spermatocytogenesis. Spermiogenesis. Spermia - structure, biology.
- Ovogeneity. The ovogenetic cycle. Menstrual cycle. Primary, secondary, mature ovarian follicle.
- Fertilization. Nidation. Segmentation.
- Evolution in $S2$.
- Evolution in $S3$.
- Evolution in $S4$ - S8. Neurulation. Gastrulation. Embryonic leaf derivatives. Limb development. Developmental anomalies.
- Embryonic appendages.
- Notions of biomechanics. Classification of joints - means of union, means of sliding. Joints of the spine with the skull, vertebral joints.
- Sternoclavicular, acromioclavicular, scapulohumeral joint - composition, motor agents. Rocking movement of the scapula.
- Elbow joint, radiocarpal joint - composition, motor agents.
- Hip joint, knee joint, tibiotarsal joint - composition, motor agents.
- Skull - neuro and viscerocranium - functional architecture of the skull, cranial anthropometric points.
- Neurocranial development.
- Development of the viscerocranium.
- Facial development - developmental abnormalities.
- Gill region, gill pouches - evolution, derivatives.
- Gill arches - evolution, derivatives.
- The mesobranchial field - evolution, derivatives. Derivatives of the primitive mouth.
- TMJ joint surfaces, means of union, means of gliding.
- ATM mechanics. Lowering, lifting, lateral movement of the mandible, functional structure of the masticatory muscles.
- Oral cavity - walls, contents, vasculature, innervation, lymphatics. Tongue - structure, vasculature, innervation. Teeth - structure, deciduous dentition, permanent dentition, group characters, vasculature, innervation.

- Salivary glands - development, small salivary glands, sublingual, submandibular, parotid glands.
- Pharynx.
- Larynx.
- Topographical regions of the face and neck.
- Respiratory development.
- Development of the heart and large vessels.
- Serous cavities of the trunk. Development, peritoneal cavity, epiploids, mesoids, partitioning of abdominal cavity, anatomic-clinical division of abdominal wall, weaknesses of abdominal wall.
- Development of the digestive system. Evolution of the proenteron, evolution of the umbilical loop, derivatives, name, physiological. Evolution of metenteron - derivatives. Cloaca and its septation. Liver development and developmental abnormalities. Development of pancreas, developmental anomalies.
- Portal vein and portocaval, visceral and parietal anastomoses.
- Development of the urogenital system. Development of pronephros, mesonephros, metanephros. Development of the ureter. Derivatives of the cloacae, development of the shape of the kidney. Developmental anomalies of the renal apparatus.
- Genital development. Undifferentiated stage of the gonad. Development of testis and male excretory tract. Development of male external genitalia. Developmental abnormalities.
- Female genital development. Development of the ovary, uterus, fallopian tube, vagina. Development of external genitalia. Developmental abnormalities.
- Retroperitoneal space. Topography of the retroperitoneal space. Renal fasciae. Large retroperitoneal vessels. Thoracic duct.
- Retroperitoneal vegetative plexuses. Lumbar sympathetic, peritoneal pelvic space.
- Male perineum - topography, structure, fasciae.
- Female perineum - topography, structure, fasciae.
- Perineal spaces, ischiorectal fossa, superficial perineal space, deep perineal space.
- Receptors and their structure.
- The pathway of thermal, painful, tactile protopathic and epicritic sensitivity.
- Kinesthetic sensitivity pathway and muscle tone control pathways.
- The gustatory and optical pathway.
- Acoustic and balance pathway.
- Reticulate formation.
- Structure of the cerebellum and its connections.
- Thalamus: nuclei, connections.
- Hypothalamus: nuclei, connections.
- Limbic system and connections.
- Structure of the cerebral cortex.
- Pyramid system.
- Extrapyramidal system.
- Brain vessels and vascular syndromes.

Practical work

- Axes and planes of orientation of the body.
- Vertebrae: type vertebra; cervical, thoracic, lumbar vertebrae. Particular vertebrae; transitional vertebrae. Sacrum and coccyx.
- The spine as a whole. Anatomy in vivo; vertebrae counting; anatomical landmarks for spinal puncture. Radiological anatomy.
- Sternum. Ribs. Thorax, bony. Live anatomy of the chest wall: orientation lines, bony and muscular reliefs; live rib counts. Radiological anatomy.
- Clavicle, scapula, humerus.
- Radius, ulna, skeleton of the hand. Live anatomy and radiological anatomy of the upper limb.
- Coxal, bony pelvis. Live anatomy: internal and external pelvimetry.
- Femur, patella.
- Tibia, fibula, leg skeleton. Live anatomy and radiological anatomy of the lower limb.

PRELIMINARY EXAMINATION- osteology.

- Basic notions of dissection. Dissection of the migrated muscles of the back and neck - m. latissimus dorsii, m. trapezius; mm. rhomboides, m. levator scapulae, mm. dentate posterior. Anatomy in vivo; weak points of the posterior wall; Petit trigon; Grynfelt tetragon; Krause pentagon.
- Dissection of the autochthonous muscles of the back. Braus scheme.
- Dissection of the nuchal region. Mm. deep of the cephalon, vessels and nerves. Live anatomy: anatomical landmarks for anaesthesia n. Arnold.
- Dissection of the anterolateral wall of the chest - m. pectoralis major, m. pectoralis minor, m. serratus anterior, m. subclavicular; mm. intercostalis. Topography of the intercostal space. Anatomical landmarks for intercostal puncture. Mammary region: structure of the mammary gland; vasculature, innervation, lymphatic drainage of the mammary gland.
- Axillary dissection. Walls of the axilla. Contents of the axilla: main vascular-nervous bundle, secondary vascular-nervous bundles. A. axillary.
- Axillary dissection. Formation of the branchial plexus. Dissection of branchial plexus branches, axillary lymph nodes.
- Dissection of the anterior region of the arm - muscles, vessels, nerves. Live anatomy. Dissection of the anterolateral region of the forearm - muscles, vessels, nerves. Carpal canal: delimitation and contents. Superficial veins of the upper limb. Live anatomy.
- Palm dissection. Topographical regions of the palm. Mm. of tenar eminence, mm. of hypotenar eminence, mm. of mid-palm region. Digito-carpal synovial sheaths. Vessels, nerves. Anatomy in vivo.
- Scapular region dissection - muscles, vessels, nerves. Live anatomy.
- Dissection of the posterior region of the arm - muscles, vessels, nerves. Bireondo-tricepital, humero-bireondo-tricepital, humero-rondo-tricepital spaces: delimitation, contents. Live anatomy.
- Dissection of the posterior region of the forearm and hand - muscles, vessels, nerves, Anatomy in vivo.

– Topographic sections at the level of the upper limb.

PRELIMINARY EXAMINATION - upper limb.

– Dissection of the anterolateral wall of the abdomen - latissimus abdominis mm; right abdominal sheath, vessels and nerves. Live anatomy of the abdominal wall: muscle reliefs, grooves, projection of lower epigastric vessels.

– Dissection of the inguinal canal - walls and orifices of the inguinal canal; contents of the canal in male and female; projection of the superficial and deep inguinal orifices; projection of the weak areas of the abdominal wall. Muscular and vascular lacuna - delimitation, contents. Formation and branches of lumbar plexus.

– Dissection of the antero-medial region of the thigh. Femoral trigone - delineation, topography. Large saphenous vein; femoral vein, femoral a. Superficial and deep inguinal lymph nodes. Sheath of femoral vessels.

– Abductor canal - delimitation, content.

– Dissection of the lateral region of the calf - muscles, vessels, nerves. Live anatomy.

– Dissection of the buttock region - muscles, vessels, nerves. Live anatomy.

– Supra- and infrapiriform space - delimitation, content. Formation of the sacral plexus.

– Dissection of the posterior region of the thigh - muscles, vessels, . N. ischiadic.

– Popliteal region dissection - topography, content. Live anatomy.

– Dissection of the posterior region of the calf - muscles, vessels, nerves. V. small saphenous vein. Calcaneal canal: delimitation, contents.

– Plantar region dissection - muscles, vessels, nerves.

– Topographic sections at the lower limb level.

Summary colloquium

– Neuro- and viscerocranium.

– Walls of the orbit, walls of the nasal, bony, infratemporal and pterygopalatine fossae. Mandible.

– Mimic muscles and facial nerve.

– Masticatory muscles and facial artery.

– Trigeminal nerve (ophthalmic nerve and maxillary nerve), ciliary ganglion, pterygopalatine ganglion (afferents, efferents).

– Mandibular nerve, otic ganglion (afferents, efferents). Submandibular ganglion (afferents, efferents).

– Posterior auricular artery, occipital artery, inferior thyroid artery and ascending pharyngeal artery (course, branches).

– Sternocleidomastoid muscle, scalene muscles, accessory nerve.

– Glossopharyngeal nerve - pathway, branches.

– Vagus nerve at the cephalic extremity. Superior and inferior laryngeal nerve.

– Hypoglossal nerve - course, branches.

– Cervical sympathetic - composition, branches.

– Subclavian artery - course, branches. Periscapular network.

– Cervical plexus - composition, superficial and deep branches. Deep cervical loop (formation, distribution).

– Infrahyoid and suprahyoid muscles. Cervical fasciae.

– Head veins - internal, external and anterior jugular (formation, tributaries). Thyroid, parathyroid (structure, relations, vascularisation).

– Lymphatics of the head and neck.

– Oral cavity and salivary glands.

PRELIMINARY EXAMINATION – cephalic extremity.

– Walls of the chest cavity. Trachea– bronchial tree.

– Lungs (description, structure, segmentation). Vascularisation of the lungs (functional and nutritional).

– Pleura– parietal pleural recesses. Projection of pulmonary sciatica.

– Heart – external appearance (faces, edges, base, tip).

– Internal appearance (atria, ventricles, interatrial and interventricular septa, orifices, valvular apparatus).

– Vascularization of the heart (coronary arteries, coronary sinus). Innervation of the heart (cardiac plexus).

– Serous and fibrous pericardium. Sinuses of the serous pericardium. Vascularisation and innervation of the pericardium.

– Mediastinum and its subdivision. Elements of the upper mediastinum. The brachiocephalic trunks of the veins, the superior vena cava, the aortic arch and its branches, the thymus and the nerve formations at this level.

– Anterior and middle mediastinum. Posterior mediastinum (thoracic oesophagus– structure, vascularisation, relationships).

– Thoracic aorta and its branches. Thoracic duct. Mediastinal lymph nodes. Thoracic sympathectomy.

– Chest recap and contents.

– Abdominal wall: structure; abdominal wall sheath; inguinal canal. Limits of the abdomen; anatomical and topographical regions of the abdomen. Live anatomy of the abdominal wall: muscular reliefs, grooves; projection of the umbilicus; projection of the superficial and deep inguinal orifices; projection of the infibrium epigastric vessels; projection of the weak areas of the abdominal wall.

– M. diaphragm: structure; hiatuses; vascularization; innervation. Projection of hiatus and diaphragmatic domes.

– Peritoneum: division. Peritoneal formations - mesos, ligaments, omentum. Structure, vascularisation, innervation. Peritoneal cavity: division; supra- and inframesocolic spaces; parieto-colic fissures; mesenteric-colic spaces.

– Sagittal and transverse peritoneal excursions. Abdominal esophagus: structure, ratios, vasculature, lymphatics, innervation.

– Stomach: configuration, structure, ratios, vascularization, lymphatics, innervation. Stomach ligaments. Live anatomy: projection of cardia and pylorus. Projection of the anterior aspect of the great curvature; Traube semilunar space. Radiological anatomy.

– Omental bursa: study of the omental bursa and its extensions; foramen bursae omentale and Winslow's hiatus.

– Pathways into the omental bursa.

– Celiac region. Dissection of the celiac trunk and its branches; celiac plexus.

– Duodenum: configuration, structure, ratios, vascularization, lymphatics, innervation. Duodenal fossae. Live anatomy: projection of D_1, D_2, D_3 and duodeno-jejunal angle to abdominal wall. Projection of the large duodenal papilla. Radiological anatomy.

– Pancreas: configuration, structure, ratios, vasculature, lymphatics, innervation. Live anatomy: projection of the pancreas.

– Liver: configuration, structure, ratios, vasculature, lymphatics, innervation. Liver ligaments. Liver segmentation. Live anatomy: projection of the liver to the abdomino-thoracic wall; trigone Labbe.

– Bile ducts: configuration, structure, ratios, vascularization, lymphatics, innervation. Live anatomy: projection of bile ducts, cystic point, pancreatico-colichodocyte Chauffard area. Dissection of the hepatic pedicle. Radiological anatomy.

– Spleen: configuration, structure, ratios, vascularity, lymphatics, innervation. Spleen ligaments. Spleen segmentation. Live anatomy: projection of the spleen.

– Mesenteric intestine: configuration, structure, ratios, vascularization, lymphatics, innervation.

– Mezenter: configuration, ratios. Dissection of the superior mesenteric artery and its branches; dissection of the superior mesenteric vein. Live anatomy: projection of jejunoileal loops, ileo-cecal angle and mesentery. Radiological anatomy.

– Cecum and vermiform appendix: configuration, structure, ratios, vascularization, lymphatics, innervation. Cecal fossae. Live anatomy: projection of cecum and appendix; appendiceal tender points. Radiological anatomy.

– Colon: configuration, division, relationships - descending colon, hepatic angle, transverse colon, splenic angle, descending colon, sigmoid: structure, vasculature, lymph, innervation. Transverse mesocolon. Dissection of the inferior mesenteric artery and its branches. Live anatomy: projection of colonic segments and flexures. Radiological anatomy.

– Rectum: structure, relations, vascularization, lymphatics, innervation. Radiological anatomy.

– Retroperitoneal space: delimitation, content, subdivision. Kidney: configuration, structure, relations, vascularisation, lymphatics, innervation. Segmentation of the kidney. Dissection of the renal pedicle. Live anatomy: projection of kidney, renal pelvis and pedicle. Radiological anatomy.

– Adrenal glands: structure, ratios, vasculature, lymphatics, innervation.

– Ureter: configuration, structure, ratios, vascularization, lymphatics, innervation. Live anatomy: ureteral projection: ureteral pain points. Radiological anatomy.

– Urinary bladder: configuration, structure, ratios, vascularization, lymphatics, innervation. Radiological anatomy. Male and female urethra: structure, ratios, vasculature, lymphatics, innervation.

– Abdominal aorta: course, relations, branches. Dissection.

– External iliac aorta: course, relations, branches.

– Internal iliac aorta: course, relations, branches. Dissection.

– Abdomino-pelvic nerve plexuses: superior mesenteric plexus, inferior mesenteric plexus, gastric plexus. V. cava inferior: formation, course, relations.

PRELIMINARY EXAMINATION - inframesocolic floor and retroperitoneal space.

– Ovary: configuration, structure, ratios, vascularization, lymphatics, innervation. Ligaments of the ovary. Ovarian spleens.
– Salpinx: configuration, structure, ratios, vascularity, lymphatics, innervation.
– Uterus: configuration, structure, ratios, vascularization, lymphatics, innervation. Means of support and suspension. Live anatomy: projection of the gravid uterus to the abdominal wall. External and internal pelvimetry.
– Vagina: structure, ratios, vascularity, lymphatics, innervation.
– Vulva: configuration, structure, vascularization, innervation.
– Testicle: configuration, structure, ratios, vascularization, lymphatics, innervation. Scrotum dissection.
– Spermatic tracts: configuration, structure, ratios, vascularization, lymphatics, innervation. Spermatic funiculus: composition, dissection.
– Seminal vesicle: structure, relations, vascularization, lymphatics, innervation.
– Prostate: structure, relations, vascularization, lymphatics, innervation.
– Penis: configuration, structure, vascularization, innervation.
– Pelvic diaphragm: muscles, fasciae, vessels, nerves, dissection.
– Urogenital diaphragm: muscles, fasciae, vessels, nerves.
– Anterior perineum in men.
– Anterior perineum in women.
– Posterior perineum. Pelvisubperitoneal space: delimitation, subdivision, contents.
– Perineal spaces: superficial perineal space; deep perineal space; ischiorectal fossa.

PRELIMINARY EXAMINATION - genital apparatus.

– External configuration of the spinal cord. Spinal nerve (composition). Reflex arc. Spinal meninges.
– Grey substance of the spinal cord. White matter (ascending, descending and medullary association fascicles).
– External configuration of the brainstem. Ventricle IV: walls, communications.
– Brainstem equivalent nuclei.
– The proper nuclei of the brainstem.
– Sections through bulb, deck, mesencefal.
– Cerebellum: lobulation, cerebellar stucture. Cerebellar afferents and efferents.
– Diencephalus. External appearance. Ventricle III: - walls, recesses, communications.
– Gyration and fissuring of the cerebral hemispheres. Brain commissures. Lateral ventricles.
– Basal ganglia. Their afferents and efferents. Internal white capsule.
– Sagittal, horizontal and frontal sections through the cerebral hemispheres.
– Cerebral meninges. CSF and its circulation.
– Arterial and venous vascularisation of the CNS.
– The eye and its appendages. Visual receptors.

Ear (external, middle, internal). Auditory and balance receptors.

PHYSIOLOGY

ANALYTICAL PROGRAMME OF COURSES AND PRACTICAL WORK

4 semesters (course 126 hours, practical work 126 ~~hours)~~

COURSES

- Introduction to physiology
  - The object of physiology as a science of integrative life logic.
  - Physiology as an experimental and clinical science: the role of experiment; the role of clinical observation.
  - Romanian physiology: contributions, perspectives.
  - Modern methods of functional research and exploration.
- Homeostasis of the main water compartments
  - Extracellular, intracellular, transcellular water: volumes; subcompartments; hydrostatic, osmotic, colloid-osmotic pressures; principles of determination.
  - The concept of "Internal Environment" with constant composition (Claude Bernard, "*Introduction to the Study of Experimental Medicine*", Paris, 1865).
  - Electrolyte and osmotic water balance: constant volemia, isoionia, isotonia; hydro-electrolyte exchange between water compartments; intake/discharge balance.
  - Possibilities and limits of homeostasis; causes of imbalance: hypo-, iso-, hypertonic dehydration; hypo-, iso-, hypertonic hyperhydration.
- Physiology of the alimentary tract
  - General features of secretory and motor functions: optimal conditions of activity for digestive enzymes; nervous regulatory mechanisms; role of "extrinsic" VNS; role of intramural plexuses; diffuse endocrine system of the digestive tract (APUD system); general trans-epithelial transport mechanisms used in absorption; motor function of smooth muscle; myenteric reflex; role of NANC mediators.
  - Salivary secretion: mechanisms of production and composition; digestive and extra-digestive roles; regulation.
  - Gastric secretion: mechanisms of production and composition; roles; regulation; experimental investigation and clinical functional exploration (importance of dynamic testing); natural clinical models of gastric hypo- and hypersecretion.
  - Pancreas exocrine secretion: mechanisms of production, composition; roles; regulation; mechanisms of "autolytic defense" (clinical significance).
  - Bile secretion: mechanisms of production, composition; hepatic bile / vesicular bile (comparison); role and significance of main components; bile acids (importance of their relation to cholesterol and lecithin); bile pigments (their normal distribution in blood, stool, urine); regulation (choleretic and anti-choleretic factors); principles of functional exploration; *jaundice* as a model of dysregulation.
  - Small intestinal mucosal secretion: secretory mechanisms, composition; roles in digestion; advantages of coupling the last phase of digestion with the beginning of absorption; regulation; principles of functional exploration.

- Secretion in the large intestine: secretory mechanisms, composition; roles; balanced saprophytic flora; regulation.
- Absorption: small intestine as a preferential site; morpho-functional specialisations; other sites of absorption; transport mechanisms for digestive end-products; monosaccharide absorption; amino acid absorption; fatty acid absorption; vitamin absorption; water and electrolyte absorption; principles of functional exploration; malabsorption.
- Motor function of the alimentary tract: mastication and deglutition: mechanisms, stages, regulation; storage, mixing and evacuation function of the stomach; motor dysfunctions in the upper stage of the alimentary tract; bile duct motility; motility of the small intestine; motility of the large intestine; general and local mechanisms of neuro-humoral regulation; intestinal and biliary motor dysfunctions.

- Physiology of energy metabolism; balanced energy balance
  - Energy expenditure: fixed expenditure; basal metabolic rate; variable energy expenditure; principles of determination.
  - Hunger-satiety balance and eating behaviour.
  - Energy value of food principles (food ration): quantitative criteria; qualitative criteria; consequences of an inadequate food ration.
  - Thermoregulation: mechanisms of thermodispersion and thermogenesis; role of the hypothalamic thermostat; physiological variations; thermoregulation in the newborn; limits of equilibrium; adaptation and acclimatization to extremes of ambient temperature; exceeding the limits of homeostasis (fever, exogenous hyperthermia, hypothermia).

- V. Endocrine gland physiology
  - Introduction to endocrine physiology. Hormones: classification; general mechanisms of synthesis, secretion, activation, inactivation, excretion; interaction with membrane and intracellular receptors; general regulatory mechanisms; "classical" definition and current review; neuroendocrine transducers; opioids; biorhythms. Romanian School of Endocrinology.
  - Pituitary gland and hypothalamic-pituitary relations. Anterior lobe of the pituitary: port system (Gr. Popa and U. Fielding); hypothalamic neuro-hormones (releasing/inhibiting). Anterior pituitary hormones: synthesis, secretion, circulating forms; interaction with receptors; physiological role; regulation. Hypothalamic-pituitary tract and posterior pituitary. ADH, oxytocin: synthesis, secretion, circulating forms; interaction with receptors; physiological role; regulation. Principles of investigation. Experimental and clinical models.
  - Physiology of the thyroid gland. thyroid hormones; synthesis, secretion, circulating forms; interaction with receptors; physiological role; regulation. Principles of investigation. Hypo- and hyperthyroidism.
  - Endocrine regulation of phospho-calcium balance. (Definition of balance. Components:intake, circulating forms, storage (bone functional structure), excretion. Role of PTH: synthesis, secretion, circulating forms; interaction with receptors; physiological role; regulation. Role of calcitonin: synthesis, secretion, circulating forms; interaction with receptors; physiological role; regulation. Vitamin D as a *hormone* (I, 24, dihydroxycholecalciferol). Functional exploration of eFC. Clinical patterns of CF imbalance.
  - Adrenal gland. Catecholamines: synthesis, secretion, circulating forms; interaction with receptors; physiological role; regulation. Other MSR hormones. Integration of the MSR into the sympatho-adrenal system; the 'alarm' reaction (W. Cannon). Pheochromocytoma. Cortical adrenals (CSR); morpho-functional organisation. General hormone biosynthesis. Glucocorticoids: synthesis, secretion, circulating forms; interaction with receptors;

physiological role; regulation; *stress response*; advantages and precautions in therapeutic use. Mineralocorticoids; synthesis, secretion, circulating forms; interaction with receptors; physiological role; regulation. Sex steroids CSR. Principles of clinical investigation. Clinical patterns of functional CSR deficiency and excess.

- Endocrine pancreas. Functional organisation of the islets of Langerhans. Insulin: history of discovery; synthesis, secretion, circulating forms; interaction with receptors; physiological role; regulation; insulin deficiency and excess; clinical significance; experimental models. Glucagon: synthesis, secretion, circulating forms; interaction with receptors; physiological role; regulation. Other pancreatic hormones (somatostatin, pancreatic polypeptide). Conclusions on glycaemic homeostasis. Functional exploration.
- Endocrine function of the gonads. Brief overview of the four sex differentiation programs: chromosomal sex; gonadal sex; phenotypic sex; behavioural sex.
- Testicle. Functional structure Steroid and peptide hormones: synthesis, secretion, circulating forms; interaction with receptors; physiological role; regulation. Puberty and andropause. Functional exploration. Deficiency and excess of testicular hormones.
- Ovary. Functional structure. Cyclic activity in adult women outside pregnancy; ovarian cycle; uterine and menstrual cycle; hypothalamic-pituitary coordination: importance of pulsatile GnRH secretion. Estrogens, progesterone and peptide hormones: synthesis, secretion, circulating forms; interaction with receptors; physiological role; regulation. Physiological variations in secretion: childhood and puberty; pregnancy and endocrine function of the placenta; menopause. Functional exploration. Dysfunctions.
- Pineal gland. Indole and peptide hormones: synthesis, secretion, circulating forms; interaction with receptors; physiological role; regulation. Role of endocrine 'clock'. Romanian achievements in pinealogy.

- Blood
  - Functions of blood - brief overview, comments. Haematocrit. Volemia; circulating and stagnant blood. Mechanisms of blood pooling and mobilisation. Variations in blood volume. Regulation of blood volume.
  - Compositions and physico-chemical properties of blood (colour, density, viscosity, osmotic pressure). Variations. Osmoregulation.
  - Function of maintaining acid-base balance. Physico-chemical mechanisms. Biological mechanisms. Regulation of intracellular Ph. Peculiarities of acid-base balance in the CNS. Acid-base balance parameters. Anion deficit.
  - Acid-base disorders, simple and complex. Acidases and alkaloses.
  - Respiratory gas transport function. Erythrocytes. O2 and CO2 transport.
  - Specific defence function. Immunophysiology. Lymphocytes.
  - Non-specific cellular defence function. Leukocytes.
  - Function to maintain fluid-coagulant balance. Haemostasis. Fibrinolysis. Therapeutic applications of blood. Transfusion. Blood groups.
- Breathing
  - Lung ventilation. Lung volumes and capacities. Mechanics of ventilation. Compliance. Flow-volume loop. Ventilation distribution.
  - Pulmonary perfusion. V/Q ratio. Alveolar-capillary diffusion.
  - Neurohumoral regulation of breathing. Respiratory reflexes. Role of peripheral and central chemoreceptors.
- Cardiovascular system

- Physiology of the heart. Heart muscle. Inotropism.
- Factors that determine it. Heart pump. The cardiac cycle. Peripheral manifestations of heart activity. Phonocardiogram.
- The excito-conducting system of the heart. Excitability. Automatism. Conductivity. Peculiarities. Factors influencing them.
- Electrocardiogram. Standard derivations. Bipolar and unipolar leads. Precordial leads. Orthogonal (frank) derivatives. Vectorcardiography.
- ECG (II). Analysis of a normal electrocardiogram. Electrocardiogram in rhythm disorders, conduction disorders, cavity hypertrophies and coronary artery perfusion disorders.
- Cardiac performance. Factors that determine it. Systolic and diastolic performance parameters.
- Regulation of cardiac performance by intrinsic and extrinsic mechanisms. Heart failure.
- Hemodynamics. Large and small circulation. Physical laws governing circulation. Arterial circulation. Determinants.
- Microcirculation. Regional peculiarities. Regulation.
- Venous circulation. Central venous pressure. Mechanism of venous return.
- Neurohumoral regulation of blood circulation. Regional haemodynamics (coronary, cerebral, cutaneous, hepatic, pulmonary, renal).

- Renal excretion
  - Kidney functions. Mechanisms of urine formation. Ultrafiltration. Clearance principle. Tubulo-glomerular feedback.
  - Physiology of the urinary tract. Reabsorption. Secretion. Saving mechanisms.
  - Renal clearance mechanisms. Nitrogen catabolite excretion. Mechanism of dilution and concentration.
  - Diuresis. Regulation of renal function. Micturition.
- Muscle system
  - Skeletal striated muscle. Sebaceous. Tetanus. Force-length relationships. Force-speed relationships. Muscle heat. Isometric and isotonic contractions. Cultu-rism. Muscle fatigue and fever. Motor unity. Neuro-muscular transmission.
- Physiology of the nervous system and sense organs
  - General physiology of the N.S. Neuron properties. Neuro-neuronal and neuro-muscular transmission. Neurotransmitters.
  - Nervous control of somatic motor activity. Regulation of tone and posture. Automatic motor control. Balance. Voluntary motor control. Motor dexterities.
  - Physiology of the vegetative nervous system. Hypothalamus. Integration of cardinal functions. Thermoregulation.
  - Higher nervous activity keeps wakefulness and sleep. Learning.
  - Memory. Conditioned reflexes. Specific human activities. Consciousness.
  - Creativity. Faith.
  - Physiology of vision. Functional processes in the eye.

– Physiology of hearing. Functional processes in the outer, middle and inner ear. Taste. Smell. Exteroception.

PRACTICAL WORK

– Water compartments in the body. Methods of determination.

– Saliva: methods of collection; detection of: calcium, phosphorus, potassium sulphocyanate; excretory function of saliva (iodine excretion); action of salivary amylase on starch.

– Endoscopy - method of exploring the digestive tract;Gastric juice: methods of collection; determination of hydrochloric acid in gastric juice; detection of free hydrochloric acid in gastric juice.

– Gastric juice: highlighting the products of gastric digestion (enzymatic action on proteins); Chlorhydropeptic activity of gastric juice; Action of labferment on milk proterins; Highlighting lactic acid in gastric juice.

– Exploring biliary function. Role of bile salts: a) emulsification of lipids; b) solubilization of cholesterol; bile pigment recognition reactions: Gmelin, Rosenbach, methylene blue.

– Pancreatic juice: Methods of collection; Pancreatic amylase assay in urine.

– Digestive motility exploration. Radiological exploration of digestive tract motility; Humoral control of gastrointestinal motility (organ bath).

– Radiological exploration of the pituitary; Exploration of the melanocytostimulatory effect of excess ACTH in frog; Pregnancy tests; Exploration of the role of ADH in water balance.

– Exploring the peripheral effects of thyroid hormones - basal metabolism.

– Exploration of peripheral effects of thyroid hormones - Achilles reflexogram; Functional and morphological exploration of the thyroid: thyroid scintigram, thyroid iodine uptake, thyroid ultrasound.

– Exploration of phosphocalcic balance with role in neuro-muscular excitability: a) clinical signs of neuro-muscular hyperexcitability: Chwostek, Weiss, Trousseau; b) rheostasis and chronaxia - parameters of neuro-muscular excitability; c) electromyography in the diagnosis of tetany and spasmophilia.

– Exploration of insulin secretion by: a) simple challenge hyperglycaemia test; b) challenge hyperglycaemia test and radioimmunological insulin assay (RIA) = insulinemia.

– Frog spinalization. Discovery and study of the frog heart in situ. Effect of temperature on heart rate. Highlighting of automaticity centres on the frog cord.

– Law of the heart (Frank-Starling).

– Influence of ions and mediators on frog heart isolated on Straub cannula.

– Influence of the vagus nerve on the frog heart.

– Direct cardiography.

– Manifestations of the cardiac cycle.

– Apexocardiogram. Carotidogram. Jugulogram.

– Manifestations of the cardiac cycle. Heart sounds. EKG phonocardiogram.

– Systolic times.

– Exploring respiratory function. Determination of lung volumes. Determination of ventilatory flow rates. FEV1.

- Respiratory gases. Determination of oxygen and carbon dioxide in exhaled and alveolar air (Orsat apparatus).
- Blood pressure. Probes: Clinostatism; Orthostatism; Exercise; Cold pressor test. Exercise EKG. Clinical methods study of central venous pressure. Capillaroscopy.
- Red blood cell count. Determination of haematocrit. Erythrocyte indices.
- Hemoglobin study. Haemoglobin dosing. Haemoglobin spectroscopy. Teichman crystals.
- Leukocyte count. Leukocyte formula.
- Haemolysis VSH.
- Blood groups, AOB system, Rh system.
- Blood properties.
- Exploring haemostasis. Bleeding time. Capillary fragility test. Platelet count. Clotting time. Quick time.
- Exploring renal function. Physical properties of urine. Dilution and concentration test.
- Urea and creatinine clearance.
- Study of acid-base balance. Seminar in blood.
- Sepsis and tetanus of the striated muscle. Dependence of skeletal muscle labor on the load to which it is subjected. The fatigue curve.
- Galvanoscopic handpiece. Laws of spinal reflex irradiation. Reflex arc analysis.
- EEG, EMG. Optical and acoustic-vestibular analyzer exploration.

ENGLISH LANGUAGE

ANALYTICAL PROGRAMME

4 semesters (practical work 112 hours)

- Unit 1 The Hippocratic oath; Doctor and Patient; The Human Body
- Unit 2 Description: cell tissues, systems
- Unit 3 Position: Organs (heart, bones, lungs)
- Unit 4 Functions: Heartbeat, breathing, metabolism, digestion, muscle movement

unit 5 Biochemistry and Biophysics

- Unit 6 Genetics
- Unit 7 Recent Medical Articles (from "The Lancet", "BMJ", "JAMA")

– Grammar and structures: The Noun, the Article, the Tenses Sentence structure in a scientific text. Paragraf writing

- Unit 1 Bedside Manner, Polite Requests

– Unit 2 Examination of the Patient

- Unit 3 Case histories
- Unit 4 Diseases
- Unit 5 Reading Scientific Papers
- Unit 6 Sugery and Causuality
- Unit 7 Recent Medical Articles
- Grammar:
- The Verb, Synthetic structures, the Adjective
- Text organization
- Presentation skills

– English teaching is based on the 4 levels of the language: reading (reading quickly to identify and select the main ideas), writing (writing a coherent and logical summary/article), speaking (expressing fluently and coherently especially by eliminating redundancies), listening to speech (listening to different texts: lectures, doctor-patient dialogue, case presentations, presentation of conference topics)

ROMANIAN LANGUAGE

ANALYTICAL PROGRAMME

4 semesters (practical work 112 hours)

- Medical terminology:
- Anatomy
  - osteology
  - myology
  - viscera
- Biochemistry
- Biophysics
- Propaedeutics
- Inorganic chemistry
- Pharmaceutical botanics
- Lessons on Romanian language, culture and civilization, adapted to the specifics of the media and pharmacy: representative personalities, Romanian initiatives, discoveries.
- Anatomy
  - central nervous system
  - sense organs
- Physiology
  - cardiovascular system
  - digestive system
  - physiology of the nervous system
- Histology
  - tissues
  - organs and systems
- Microbiology
  - pathogenic cocci
  - immunity
- Biology and genetics
  - self-organisation
  - adaptability
  - normal genetic systems
  - ways in which traits are inherited
- Propaedeutics
  - prosthesis
- Organic Chemistry
  - organic compounds
  - hydrocarbons

PHYSICAL EDUCATION

ANALYTICAL PROGRAMME

4 semesters (practical work 112 hours)

- Physical education and sport are important components of the educational process of students and are unanimously appreciated for their compensatory role in ensuring a balance between intellectual and physical activity, for the support they provide to increase the effort capacity required by professional activity, for their contribution to harmonious physical development, maintenance and strengthening of health, as well as the use of leisure time in a pleasant, useful, recreational and organized way.
- The teaching process is addressed to students in the first and second years, and is oriented towards the initiation and methodical learning of the technique and tactics of a sport discipline, at the student's choice, and towards the achievement of general physical training and specific to the branch of sport practiced.

Programme content	Year I no of hours		Total	Year II no. of hours		Total
	No I	Sem II		No I	Sem II	
General and specific physical training (speed, skill, strength and endurance)	18	18	36	20	16	36
Technical training	12	12	24	16	14	30
Tactical training	12	12	24	16	14	30
Psychological training	8	8	16	10	10	20
Theoretical training	4	4	8	2	2	4
Physical and athletic control tests (50m, long jump with elan, endurance running, pull-ups (B), push-ups (F), abdominal strength, jumps	10	10	20		8	8
Total	64	64	128	64	64	128

Year I

BIOPHYSICS

COURSE SYLLABUS AND PRACTICAL WORK

1 semester (course 28 hours, practical work 42 hours)

COURSES

- Definition, issues and chapters of biophysics.
- Elements of biomechanics: Notions of mechanics; Mechanical properties of deformable bodies; Notions of strength of materials; Mechanical manifestations of muscle contraction; Biophysical mechanism of muscle contraction; Notions of fluid biomechanics; Biological effects of some mechanical factors.
- Elements of thermodynamics: definition of thermodynamics. Biological systems from a thermodynamic point of view; Thermodynamic flows and forces; Principle I of thermodynamics and its applications in biology; Principle II of thermodynamics and its significance in biology.
- Molecular biophysics of water and aqueous solutions: Molecular physics of liquids; Molecular structure of water and aqueous solutions; Molecular structure of water in biological systems; Physics of dispersed systems; Transport phenomena in solutions; Transport phenomena across cell membranes.
- Elements of bioelectricity and bioexcitability: notions of electrostatics and electrokinetics; cellular bioelectrogenesis; bioelectrogenesis of tissues and organs; notions of bioexcitability; biological effects of excitability.
- Elements of bioacoustics: Notions of acoustics; Characteristics of heard sound; Biophysics of auditory reception; Elements of phonation; Biological effects of ultrasound.
- Elements of biological optics: Notions of optics; Properties of ocular diopters; Biophysical mechanisms of visual reception; Bioluminescence.
- Biocybernetics: definition and chapters of cybernetics; Cybernetics thinking; Abstraction and modeling; Information and information entropy; Signal processing in cybernetics, applications in biology; Remote information transmission systems; Biological and technical informatics; Cybernetic control systems, applications in biology.
- Elements of psychophysics: Definition of psychophysics; Objective measurement of sensation strength; Weber-Fechner law and power law; Ways of encoding excitant properties in the process of sensation generation.
- Elements of photobiology: interaction of non-ionising electromagnetic radiation with substance; biological effects of visible and ultraviolet radiation.
- Elements of radiobiology: ionizing radiation dosimetry; Mechanism of ionizing radiation interaction with living matter; Dose-effect relationships; Biological effects of ionizing radiation; Protection against ionizing radiation.
- Physical techniques used in biomedical exploration: Biosignal collection; Electrodes, transducers and biosensors; Biosignal amplification and recording; Medical imaging; Therapeutic procedures based on physical factors.

- Techniques used in the study of macromolecules: physical structure of macromolecules; experimental determination of mass, shape and size of macromolecules; experimental determination of electrical properties of macromolecules.

PRACTICAL WORK

- Determination of the concentration of an optically active substance using the polarimeter.
- Determination of the concentration of a solution by refractometer.
- Determination of viscosities of solutions.
- Determination of the surface tension coefficient of solutions.
- Study of the light microscope; determination of the size of some red blood cells.
- Plotting the spectrophotometric curve of a solution.
- Cathode oscilloscope study.
- Determining lens convergence.
- Recording an audiogram.
- Passive transport study based on conductivity measurements of solutions.
- Determination of the decay rate of radioactive nuclides; effectiveness of screens; measurement of total blood volume.
- Basics of using electronic computers.
- DOS operating system.
- Basics of computer networking.
- Analog-digital interface study; Poisson analysis of the nuclear decay rate of radionuclides.
- Performing an electrocardiogram and analysing it with the help of an electronic computer.

GENERAL AND MEDICAL BIOCHEMISTRY

COURSE SYLLABUS AND PRACTICAL WORK

2 semesters (course 70 hours, practical work 84 hours)

COURSES

- Proteins:
  - Proteinogenic amino acids: structure, properties. Amino acid derivatives and other important amino acids.
  - Peptides: structure, peptide bond characteristics, properties, important natural peptides.
  - The primary structure of proteins. Protein conformation: secondary, tertiary and quaternary structures. Ionisation, denaturation, other properties of proteins.
  - Protein classification criteria. Various heteroproteins.
  - Plasma proteins; electrophoresis fractions and their characteristics; immunoglobulins and fibrinogen.
  - Hemoproteins.
  - Collagen and elastin.
- Enzimele:
  - Characteristics of enzymes; decrease in activation energy of catalyzed reactions, catalytic capacity, various specificities.
  - Structure and mode of action of enzymes; active centre, enzyme cofactors, catalytic mechanisms, isoenzymes, multi-enzyme complexes.
  - Enzyme kinetics: Michaelis-Menten and Lineweaver-Burk equations, Michaelis constant, inhibitors, factors influencing the rate of enzymatic reactions.
  - Allosteric and covalent regulation of enzyme activity.
  - Coenzymes: structures and functions.
  - Enzymes in pathology.
- Nucleic acids:
  - Structural components: nitrogenous bases, nucleosides, nucleotides.
  - Covalent structure and conformation of DNA. Organisation of genetic material in prokaryotes and eukaryotes. Eukaryotic genome architecture.
  - DNA biosynthesis (replication). Replication inhibitors in prokaryotes and eukaryotes. DNA synthesis on RNA arrays (reverse transcription).
  - Types of RNA, their structural and functional characteristics.
  - RNA biosynthesis on DNA template (transcription), post-transcriptional processing. RNA biosynthesis on RNA template.
- Protein biosynthesis:
  - Genetic code.

- Biosynthesis steps, process regulation, post-translational processing.
- DNA molecule damage and repair mechanisms, mutations and their phenotypic expression.
- In vivo gene cloning (recombinant DNA technology), in vitro cloning (PCR) applications of gene cloning.

- Biochemical energetics:
  - Thermodynamic aspects of reactions in living organisms; entropy, free energy, reaction, exergonic and endergonic reactions.
  - Energy transfer mechanisms in the living world. Macroergic bonds, macroergic nucleotide (ATP) and other compounds.
  - ATP biosynthesis pathways: substrate-level phosphorylation, tricarboxylic acid cycle, respiratory chain and oxidative phosphorylation.
  - Incompletely reduced oxygen species. Free radical pathology.
- Carbohydrate metabolism:
  - Monosaccharides, oligosaccharides, polysaccharides: structures, properties, roles. Aminosaccharides, deoxysaccharides.
  - Digestion and absorption of carbohydrates.
  - Glucose metabolic pathways; glycolysis, pentoxophosphate shunt, glucuronic acid pathway, gluconeogenesis; regulation.
  - Glycogen biosynthesis and degradation; regulation.
  - Metabolism of galactose and fructose.
  - Clinical correlates: lactic acidosis, diabetes mellitus, alcohol - inhibitor of gluconeogenesis, genetic enzyme deficiencies in glucose, galactose and fructose metabolism; glycogen storage diseases.
  - Glycoproteins and proteoglycans: structures, roles.
- Lipid metabolism:
  - Fatty acids, acylglycerols, glycerophospholipids, sphingolipids, steroids: structures and roles.
  - Digestion and absorption of lipids.
  - Degradation and biosynthesis of fatty acids; regulations.
  - Degradation and absorption of acylglycerols; regulations.
  - Metabolism of ketone bodies; regulation of ketogenesis.
  - Aspects of glycerophospholipid and sphingolipid metabolism.
  - Cholesterol metabolism.
  - Lipid peroxidation; antioxidant protection.
  - Plasma lipids.
- Eicosanoids. Clinical correlates :diabetic ketoacidosis, hypercholesterolemia (TSA), role of LDL oxidation in atherogenesis, enzyme deficiencies, etc.
- Protein and amino acid metabolism:
  - Dynamic state of proteins. Nitrogen balances.
  - Protein digestion and amino acid absorption; amino acid background, essential and non-essential amino acids.

- Deamination of amino acids and transport of the resulting ammonia.
- Biosynthesis and elimination of urea.
- Use of the hydrocarbon skeleton of amino acids.
- Biosynthesis of non-essential amino acids.
- Synthesis from amino acids of glutathione and creatine; their role.
- Participation of amino acids in conjugations.
- Clinical correlations.

- Haemoprotein metabolism:
  - Structures and names of porphyrins, porphyrins, protoporphyrin IX and heme.
  - Heme biosynthesis and catabolism; regulations.
  - Clinical correlations.
- Nucleotide metabolism:
  - Biosynthesis and degradation of purine nucleotides.
  - Interconversions and reuse of purines.
  - Regulation of pyrimidine nucleotide biosynthesis and degradation processes.
  - Clinical correlations.
- Biochemistry of hormones:
  - Definitions, classification criteria.
  - Hormone receptors.
  - Mechanisms of action.
  - Biosynthesis, secretion, structures and effects of hormones on metabolism.
  - Getting to know about growth factors, interleukins, interferons, endorphins and oncogenes.

PRACTICAL WORK

- Solutions:
  - Preparation of solutions of various concentrations: percentage, molar, normal; pH of solutions and its determination. Buffer solutions and buffering capacity including amino acid and protein solutions.
- Volume:
  - Volumetric dosing principle. Volumetric analyses based on neutralization reactions, redox reactions, complex formation reactions.
  - Medical applications: dosing of gastric juice, urinary ammonia, etc.
- Properties of amino acids and proteins:
  - Important recognition reactions. Protein denaturation. Ionisation and isoelectric pH.
  - Electrophoresis: general principles, types of electrophoresis (in solution, on paper, and gels). Applications to the separation of amino acids and plasma proteins.
  - Chromatography: general principles of chromatography, applications to amino acid and protein separation.
  - Spectroscopic analysis by absorption (UV, visible, IR), emission and fluorescence. Applications to the study of protein structure and in particular haemoglobins. Principle of colorimetric determination and applications.

  - Centrifugation: general principles and applications.

- Enzimele:
  - Enzyme activity and the influence of physico-chemical factors on it: pH, temperature, inhibitors.
  - Enzyme kinetics: determination of K_M.
  - Medical applications: determination of enzyme activity in saliva and plasma: amylase, phosphatases, cholinesterase, lipases, aminotransferases, lactate dehydrogenase and its isoenzymes; importance for diagnosis.
- Nucleic acids:
  - Component-specific reactions.
  - DNA and RNA assay.
  - DNA denaturation and renaturation.
  - Plasma uric acid assay, diagnostic importance.
- Mineral compounds:
  - Determination of plasma concentration of iron, copper, calcium, phosphorus, chlorine; medical importance.
- Hormones:
  - Determination of catecholamine catabolism products in urine.
  - Dosing of 17-hydroxy and 17-keto urinary steroids.
- Carbohydrates and carbohydrate metabolism:
  - Important reactions of monosaccharides, oligosaccharides, polysaccharides; diagnostic use.
  - Study of glycolysis and the influence of some hormones on it.
  - Blood glucose: methods of determination, medical importance.
- Lipids and lipid metabolism:
  - Important reactions of various lipids and their use for diagnostic purposes.
  - Lipid peroxidation, determination of malondialdehyde.
  - Determination of plasma concentration of lipids: total, fatty acids, cholesterol, ketone bodies, and lipoprotein fractions. Medical significance.
  - Influence of some hormones on lipid metabolism.
- Protein and haemoprotein metabolism:
- Determination of plasma concentration of total protein, fibrinogen, bilirubin, creatinine, haemoglobin. Identification of some of them in urine. Importance for diagnosis.
- State-of-the-art techniques used in biochemistry (demonstration):
  - Ultracentrifugation.
  - PCR.
  - HPLC.
  - Various automated analyses.
  - PC (computer).

GENETICS

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

1 semester (28 hours of courses, 42 hours of practical work)

Course

- The human genome and the storage of genetic information. The nature of hereditary material.
  - DNA structure: primary, secondary, tertiary.
  - Isomorphic forms of the double helix, DNA types: A, B and Z.
  - Heterogeneity of chromosomal DNA sequences: repetitive DNA (highly and moderately repetitive), palindromic complex, non-repetitive DNA (unique sequences); principles of DNA sequence determination.
  - Genome banking and DNA cloning: molecular probes (DNA and/or RNA) labelling, use; DNA hybridisation, principles and methods.
  - The importance of DNA analysis for applications:
    - ⇒ DNA and medical ethics (the use of probes in mutant gene screening and mapping); DNA and forensics (the use of molecular probes in establishing genetic parentage).
    - ⇒ DNA and evolution: biochemical palaeogenetics; DNA and human evolution; evolution of physiological mechanisms; human genetic future.
    - ⇒ DNA and the genetic determinism of human traits.
    - ⇒ DNA and phenotypic diversity of human traits.
    - ⇒ DNA and genetic engineering: current and perspectives, genetic engineering methods; obtaining human proteins for therapeutic purposes, vaccines, bioreagents; modification of genetic material: restriction fragment excision, small deletions, sequence addition; inserted genes, cloning and gene amplification, expression of inserted genes.
  - DNA synthesis.
    - ⇒ Replication fork; replication; superhelixes; DNA replication in eukaryotes and folding rate.
    - ⇒ DNA synthesis 'directed' by RNA.
    - ⇒ DNA synthesis of the human genome.
    - ⇒ DNA replication asynchrony in the human genome: causes, consequences, repetitive and non-repetitive sequences.
  - DNA repair and recombination. Gene conversion. Recombinant DNA and social responsibility.
  - DNA functions.
  - Types of RNA in the cell in eukaryotes: mRNA, rRNA, tRNA. Ribonucleic acid synthesis, genetic control.
- Gene - the unit of DNA function, recombination and mutagenesis.
  - The gene concept.
  - Organisation of different types of genes. Discontinuous genes (introns - exons); genes encoding tRNA, rRNA, 5S RNA; genes encoding histones.
  - Transposable genetic elements.
  - Gene characteristics related to chromosome: locus; linearity; linkage; cros-sing-over; gene size; number of genes in genotype; chromosome map.
  - Types of genes, traits, characteristics:
    ⇒ Specificity; penetrance and expressivity; auto- and hetero-catalytic function of genes; "domestic", "candidate", "selfish", pseudogene, mutant, lethal, dominant, recessive, codominant genes.
  - Deviations from the dominance/recessivity ratio: pleiotropy, epistasis, lethal genes.

- Gene-character-environment relationships. Polygenic inheritance. Gaussian distribution of polygenically controlled traits. Cumulative effect of genes. Quasi-quantitative distribution.

- Expression (materialisation) of genetic information.
  - Protein biosynthesis. Genetic information flow. The genetic code. Origin and evolution of the genetic code, characteristics.
  - Transcription of genetic information.
  - Translation of genetic information, polypeptide chain formation.
  - Genetic regulation of protein synthesis:
    ⇒ Mechanisms of gene regulation in prokaryotes.
    ⇒ Levels of regulation in eukaryotes: control of mRNA maturation; control of RNA transport; control of RNA translation; control of RNA degradation.
    ⇒ Gene regulation at the nucleosomal fibril level.
    ⇒ Stable genetic regulation by facultative heterochromatinization. The role of chromosomal pro-proteins in genetic regulation.
    ⇒ "Antisense" molecules and genetic regulation of protein synthesis.
- Mendelian inheritance in humans.
  - Mendel's Laws.
  - Autosomal dominance: incomplete penetrance; influence of homozygous status on expression of dominant mutant genes.
  - Autosomal recessive; pseudodominance in autosomal recessive inheritance; compound heterozygous.
  - Codominance.
  - X - linkage: recessive X-linked; dominant X-linked; X - dominant linkage with hemizygous male lethality.
  - Analysis of segregation rates as probability.
  - Ecological genetics: environmentally 'dependent' genetically predisposed traits.
- Non-cromosomal inheritance.
  - General properties of non-cromosomal inheritance: nemendelian behaviour; cytoplasmic hereditary carriers; mitochondrial genetic determinants: - mitochondrial genetic apparatus, protein biosynthesis in mitochondria, mitochondrial mutants in eukaryotes type: Killer, Kappa particles, lambda, antibiotic resistant mutants; hypothesis of extracellular origin of mitochondria.
- Genome organization in eukaryotes and humans.
  - Human chromosomes: number, size, morphology, nomenclature, chromosome types, chromosome topography.
  - Molecular constituents of the chromosome in eukaryotes: DNA, RNA, histone and nonhistone proteins. One DNA 'molecule' per chromosome.
  - Molecular architecture of the chromosome: the polynucleosomal and sole-noid system. Condensation steps of chromatin A and B fibrils.
  - Heterochromatin - euchromatin and chromosomal bands. Centromeric DNA.
  - Chromosomes and cell cycle phases - meiotic and mitotic.
  - Chromosome polymorphism: chromosomes and evolution; gene and chromosome evolution; factors involved and mechanisms in chromosome evolution (hypotheses); relationship between chromosome structure and chromosomal rearrangements; human karyotype phylogeny.
  - Normal human karyotype.
  - Chromosome replication and transcription; their functions.
- Variability in eukaryotes and humans. Recombination in sexual eukaryotes:
  - Genomic recombination.
  - Interchromosomal recombination.
  - Intrachromosomal recombination (crossing-over). Cross-over mechanism, calculation, implications.

- Mutations in the genetic machinery of eukaryotes.
  - Random" (spontaneous) mutations.
  - Induced mutations:
    - ⇒ Mutagenic factors; man and mutagenic factors.
    - ⇒ Levels at which mutations occur in the eukaryotic genetic apparatus: genomic mutations (polyploidy, aneuploidy); chromosomal mutations; gene mutations.
  - Coding and types of mutations; frequency of mutations in humans. Consequences of mutations in humans.
  - Genetics and oncogenesis. Etiology of cancer disease (oncogenic factors); cytogenetic aspects in cancer cells; oncogenic gene hypothesis.
- Phenocopies (congenital malformations).
  - Normal embryo-fetal development in humans.
  - Development and differentiation in humans: molecular mechanism of morphogenesis; genetic mechanism and regulation of differentiation. Hormones and their role in differentiation.
  - Chronogenesis and spatial organization of the embryo.
  - Getting to teratogenesis.
  - Etiology (malformations) of phenocopies; teratogenic factors; teratogenic mechanisms; teratogenic timing; frequency (congenital malformations) of phenocopies. Phenotypic effects.
- Sexual determinism and gonadal differentiation in humans.
  - Genetic sex.
  - Postgenetic sex.
  - Genetic regulation of sex differentiation in mammals and humans.
  - Evolution of sex chromosome inactivation.
  - The bio-genetic significance of the sexes; the sex ratio.
  - Genetically determined gonadal morphodisplasia.
- Human population genetics. Genetic structure of human populations (population genome).
  - Gene frequency determination. Hardy-Weinberg law.
  - Probability of combining two independent events. Binomial distribution.
  - Population-based dominant and recessive gene frequency tests. χ^2 test of significance. Bayes method of risk estimation.
  - Gene frequency in finite populations. Distribution of rare genes.
  - Factors that change the genetic balance in the population.
  - Erythrocyte and plasma gene systems; pharmacogenetic reactions; HLA system (tissue antigens); elements of immunogenetics.
- Notions of chronogenetics.
  - Gene stability: ergon, synonymous, chronon.
  - The ergon/cronon system.
  - Chronogenetics of the human organism.
  - Chronogenetics and: ontogeny, homeostasis, (degenerative) diseases.
  - Diseases and ergon/cronon system.
  - Population chronogenetics and preventive medicine.
- Genetics and medical bioethics.
  - Determinants in the emergence of bioethics.
  - Problems of medical bioethics: artificial procreation; genetic engineering; tissue and organ transplantation; human research over ontogenetic periods; the problem of the rights of the mentally ill; euthanasia; from eugenics to social biology.
  - Uncertainties and genetic limits of behaviour.
  - Advances in genetic screening.
  - Genetics and prevention.

- The social effect of genetic screening.
- Ethics and genetics.

Practical work

- The study of meiosis in humans.
  - Methods for chromosome detection in meiosis.
  - Stages and phases of meiosis.
  - Topography of meiotic phases.
  - Sex chromosome behaviour in meiosis.
  - Mythogram.
  - Bio-medical significance of the study of meiosis.
- Sex chromosome analysis in humans.
  - Origin of sex corpuscles.
  - Barr corpuscle - perinuclear appendages.
  - Detection methods for sex corpuscle X ('sex chromatin') and sex corpuscle Y ('F chromatin').
  - Biological and diagnostic importance.
- Cell cultures from peripheral blood.
  - Methods.
  - Perform a short-term culture of lymphocytes.
  - "Sacrifice" the culture, make and analyse chromosome preparations.
- Normal human karyotype.
  - The technique of normal human karyotyping.
  - Criteria for identification, numbering, classification of chromosomes.
  - Reading and interpreting the karyotype.
  - Diagnostic value.
- Banding of human chromosomes.
  - Chromosome banding techniques.
  - Types of bands in human chromosomes.
  - The importance of banding in evolutionary studies (anthropogenesis).
  - Applicability to mutagenesis studies and clinical diagnosis.
- Mendelian single-factor inheritance.
  - Monohybridization in autosomal genes (dominant, recessive, codominant).
  - Monohybridization in genes with loci on sex chromosomes ('sex-linked' inheritance).
  - Dishibition.
- Erythrocyte genetic systems in humans.
  - Types of erythrocyte genetic systems.
  - Methods of highlighting and analysis.
  - Importance of systems in establishing genetic parentage and/or genetic markers in human pathology.
- Plasma genetic systems in humans.
  - Types of plasma genetic systems in humans.
  - Methods of highlighting and analysis.
  - Applications in establishing genetic parentage and genetic constitutional type.
- Polygenic inheritance - dermatoglyphs.
  - Genetics of palmoplantar dermatoglyphs.
  - Technique of dermatoglyph collection and analysis.
  - Classification of normal dermatoglyphs.
  - Palmoplantar dermatoglyphs.
  - Importance of dermatoglyph analysis: constitutional type, genetic parentage, diagnosis.
- Biometric assessment of somatic development in humans.
  - Biometrics - biotype.

  - Genetics of somatic development in humans.
  - Cephalometric indices.
  - Somatometric indices.
  - Cronquit index.
  - Prenatal biometry.
  - Postnatal biometrics.
  - Normal and/or pathological morphology.
- Study of embryopathies and chromosomal aberrations.
  - Topography of embryopathies - demonstrations.
  - Chromosomal aberrations of number and structure - demonstrations.
  - Coding chromosomal aberrations.
  - Analysis of karyotypes with aneuploidy and chromosome structure aberrations.
- Environmental mutagenicity testing methods.
  - Exchange between sister chromatids.
  - Micronucleus test.
  - Effect of mutagenic agents on cell cultures.
- Elements of genetic engineering.
  - Methods used in genetic manipulation.
  - Molecular fingerprints and probes.
  - Medical importance - applications.
  - Role in chromosome mapping.
- Elements of gemmology.
  - Types of twins.
  - Determination of twinning: study methods, investigation of the twin couple.
  - Character concordance and discordance in twin couples.
- Family survey and family tree compilation.
  - Genealogical data obtained from the family survey.
  - Principle and criteria of family tree compilation.
  - Conventional signs used.
  - Family tree analysis and interpretation.
- Genetic counselling and genetic counselling.
  - Genetic counselling.
  - Recommended methods for genetic investigations (principles).
  - Prognosis and genetic counselling.
  - The bio-medico-social importance of genetic counselling and advice.
- Establishing genetic parentage.
  - Methods used (principles and demonstrations).
  - Identifying paternity and/or maternity of a child.
  - Establishing recurrence.
  - Applications and applicability.
- Genetic screening in hereditary dysmetabolisms.
  - Methods for identifying homozygotes.
  - Methods for identifying heterozygotes.
  - Assessment of the risk of mutant gene transmission and phenotypic manifestation of dysmetabolism.
- Population genetics.
  - Gene frequency (dominant - recessive) using the Hardy - Weinberg law.
  - Determining gene frequency when three alleles are involved.
  - Applying the test χ^2 .
  - Calculating the inbreeding coefficient in humans.
  - Risk calculation and mutagenicity index.

– Appreciation of natural selection.

CELL BIOLOGY

COURSE SYLLABUS AND PRACTICAL WORK

1 semester (course 28 hours, practical work 42 hours)

COURSES

- The subject and history of cell biology.
- General organization of a eukaryotic cell. Comparison between prokaryotes and eukaryotes.
- Models of cell membrane structure. Molecular organization of the membrane.
- Membrane transport. Transmembrane signalling.
- Intercellular junctions. Cilia, flagella, microvilli.
- Cell inclusions, lysosomes, peroxisomes.
- Mitochondria.
- Ribosomes, smooth and rough endoplasmic reticulum.
- Golgi apparatus. Cell secretory cycle G. E. Palade.
- Cytoplasmic matrix. Cytosol.
- Cell nucleus: general organisation, nuclear envelope, nucleolus.
- Chromatin (chromosomes). Nuclear matrix.
- Cell cycle and cell division. Cell proliferation and differentiation.

PRACTICAL WORK

- The object and methods of cell biology.
- Types of optical microscopes.
- Technique of obtaining the microscopic preparation for the light microscope.
- Staining and dyes in light microscopy.
- Microscopic preparation examination technique. Main histological stains. Cell shapes, light microscopic organization of a eukaryotic cell.
- Principles of histochemistry and histoenzymology.
- Modern techniques in cell biology: cell homogenization and fractionation, cell culture, flow cytometry.
- Types of electron microscopes. Technique of obtaining the preparation for the transmission electron micro-scope.
- Cell membrane. Cell junctions.
- Ultrastructural organization of the eukaryotic cell: undifferentiated membrane organelles.
- Ultrastructural organization of the eukaryotic cell: organelles bounded by membranes.
- Morphometric analysis of a microscopic image.
- Nucleus: organisation visible under the light microscope. Types of nuclei.
- Core: ultrastructural organization.
- Cell cycle. Cell division.
- Cell proliferation and differentiation. Cell types found in the human body.

HEALTH PSYCHOLOGY AND COMMUNICATION WITH THE PATIENT

COURSE SYLLABUS AND PRACTICAL WORK
1 semester (14 hours of courses and 28 hours of practical work)

COURSES

● Introduction to medical psychology.

- Health and disease.
- The bio-psycho-social model of disease.
- Objectives of the medical profession.
- Definition and scope of medical psychology. The three component disciplines: health psychology, psychosomatics and psychosocial medicine.
- Interdisciplinary relations. Psychological qualities needed by medical staff

● Psychological foundations of medical practice

- Personality concepts and theories.
- Motivation and affectivity.
- Aspects of personality development in children.
- Psychological peculiarities-with implications for sickness behaviour-dependent on age and gender.

● Elements of health psychology

- The concept of health psychology.
- Sanogenetic behaviours. Psychological motivations.Possibilities of optimization.
- Immunogenic and dysimmunogenic personality traits.
- Psychobehavioral risk factors for illness-the Alameda study; the concept of type A and C personality in relation to vulnerability to stress.

● Psychological stress - an operational concept located between psycho-behavioral risk factors and disease.

- Notional framework; eustress and distress; basic characteristics of psychological stressors.
- General conditions of MS occurrence; neuro-vegetative mechanisms and main hormones involved in the stress reaction.
- Classification of the main types of MS ;Holmes-Rahe scale.
- Experimental and epidemiological evidence in favour of SP involvement in pathogenesis.
- Conscious and unconscious adaptive strategies during MS.

● Psychosomatic concept in medicine.

- The notion of psychogenic etiology of different diseases; the pathogenic scope of action of psychic stimuli.
- The concept of psychosomatic medicine in contemporary times.

– Triggering by psychological stress or conditioned reflexes of pathological manifestations; hierarchical intertwining of psychological factors with other etiological factors in pathogenesis.

- Somatopsychic and psychosomatic disorders, psychosomatic diseases and organ meiopragia.
- Psychogenic disorders of sexual dynamics. Classification, causes, principles of psychological therapy.

● Doctor-patient interpersonal relationship

- Elements of status and social role of doctor and patient; the three levels of the interpersonal relationship between doctor and patient (intellectual, affective and ethical).
- Ways of psychological approach to the patient (technical, psychoanalytic, omni-practitioner type of history taking); doctor and patient dependent factors in history taking and diagnostic and therapeutic errors implied by these conditions.
- Relational qualities needed by the doctor in establishing an effective interpersonal relationship with the patient.
- Types of patients in their relationship with the doctor. Principles of psychosomatic approach to patients.
- Balint, Ascona and Monte Verita groups.Conditions for optimizing the doctor-patient interpersonal relationship.

● Elements of psychotherapy

- Psychological help and psychotherapy - conceptual data.Simple (supportive) supportive psychotherapy - fundamental element in the treatment of the patient.
- Elements of applicability of PTS in general medicine and non-psychiatric specialties; suggestive elements contained in PTS.
- Particular aspects of PTS in different medical conditions.
- Principles of anti-stress therapy.
- Music therapy and Schultz autogenous training - forms of psychotherapy with wide potential for use in non-psychiatric medical practice.

● Psychology of medicine and quality of life

- Placebo effect.Adverse drug reactions and their psychological impact.Drug addiction (examples - to analgesics or cortisone).
- Therapeutic compliance and psychological influencing factors.
- Quality of life indices and their role in the evaluation of new medicines.

● Psychological, psychosomatic and somatopsychological aspects of pain

- Pain - subjective resonance.

- Psychophysiological mechanisms.
- Psychological amplifying or diminishing factors.
- Organic and psychogenic pain.
– Psychotherapeutic procedures to combat pain.

PRACTICAL WORK

LP1.Theoretical content.-Defining health.Individuals' concerns for health cultivation.Psychobehavioral risk factors for illness with psychogenic impact. Sanogenic behaviours. Laughter - multi-functional complex with anti-stress properties and sanogenic implications.

Practical applications - Attitude questionnaires for health and illness issues. Questionnaire on optimism and self-efficacy.Questionnaire on "consumption" behaviours (tobacco, alcohol, coffee).Questionnaire on inclination to humour.

LP2.Theoretical content.-Disease definitions. Discussions on the three aspects of the disease postulated by Leriche.Analysis of the causes of the patients' reluctance to present for consultation. "The circuit of patients."

Practical applications- Recorded interviews and discussions with patients on the psychosomatic discomfort and existential impasse generated by the disease. Questionnaire - quality of life indices. Hospital anxiety and depression-questionnaire for analysis of anxiety and depression secondary to stress and/or illness.

LP3. Theoretical content -Involvement of the psychological factor in pathogenesis. Explanatory models (Engel, Fisher, Contrada). Functional disorders. Classification.

Practical applications - Examples: prospective and retrospective epidemiological studies. Functional disorders questionnaire (Fragebogen Beschwerden Freiburg). Dongier table.

LP4 Theoretical content.Psychological stress:definition, classification (Golu, Iamandescu).Adjustment behaviours. Place of control. Social support.

Practical applications. Questionnaire Univ. Colombia. Polygraph - "lie detector" - applications in psychosomatic disorders. Control place questionnaire (Lumpkin).

LP5.Theoretical content.Principles of anti-stress behaviour. Anti-stress programmes (New Start). Music therapy - a form of using music as a therapeutic and prophylactic anti-stress element.

Practical applications. Music Test W - complete with analysis of personal ways of decoding the musical message. Schultz autogenous training (theoretical premises + examples)

LP6. Theoretical content. Psychosomatic diseases: definition of psychosomatic disorders, psychosomatic diseases. Somatopsychic disorders - principles and means of somatopsychic therapeutic approach.

Practical applications . Questionnaire type A (Jenkins test). Psychosomatic approach to obese patients (principles of using behavioural psychotherapy in obesity).

LP7. Theoretical content. Interpersonal relationship doctor - patient. Principles of verbal and non-verbal intelligent communication. Types of questions (open, closed, suggestive). Particulars of establishing interpersonal relationships according to age, gender, and field of nursing.

Practical applications.MMPI test scales. Interviews - examples of types of anamnesis.Social support test. Models of analysis of the impact of emotional problems of communication with the patient (Balint, Ascona, Monte Verita groups).

LP8.Theoretical content.Supportive psychotherapy.Theoretical notions and principles of application by the family doctor.Principles of approaching the sexological problems of the patient.

Principles of group psychotherapy in psychosomatic illnesses (examples for rheumatic patients).Possibilities of approaching patients regarding their sexual problems.

LP9. Theoretical content Psychological problems generated by the drug.Placebo effect . Drug dependence . Therapeutic compliance : psychological factors involved and conditions of optimization.

Practical applications. Therapeutic compliance questionnaire. Recorded interview with corticodependent patients. Double blind test - psychological establishment.

MARKETING AND MEDICAL TECHNOLOGY

ANALYTICAL PROGRAMME OF COURSES AND PRACTICAL WORK
1 semester (14 hours course, 14 hours practical work)

COURSES

- Marketing health systems
  - Marketing concept, definition of health system marketing
  - Conceptual developments
  - Operational elements of health system marketing
- Health care services - part of the health system
  - Concept of service, approaches to defining services, classifications
  - Defining the health service, Marketing the health service.
  - Planning and control of marketing activity in health services
- Health services market
  - Definition, Types of markets.
  - Structure of the health services market
  - The particularities of the health services market.
- The price of health services
  - What is the price? General methods of price calculation
  - Factors taken into account when setting the price
  - Health consumers' reaction to price changes
  - Competitors' reaction to the price change
- Marketing research in health services
  - The need for a marketing research approach
  - Marketing research objectives
  - Functions of marketing research
- The price of health services
  - What is the price? General methods of price calculation
  - Factors taken into account when setting the price
  - Health consumers' reaction to price changes
  - Competitors' reaction to the price change
- Communication in health services marketing

- Defining the communication process
- Steps to effective communication
  – Communication objectives

- Health services distribution policy
  - Content and role of distribution
  - The place of distribution in the marketing mix
    – Distribution channels
- Promoting the health service. Social marketing
  - Promotion mix
  - Advertisement
    – Advertising - important decisions
- Medical equipment and technology for functional explorations;
- Medical equipment and technology for medical analysis;
- Medical imaging equipment and technology;
- Medical equipment and technology for anaesthesia and therapy;
- Medical equipment and technology for surgery;
- Medical equipment and technology for electro-physiotherapy;
- Medical equipment and technology for dermatology, ENT and ophthalmology;
- Special medical equipment and technology used in medicine.

PRACTICAL WORK

- Health system marketing objectives. Functions and role of marketing;
- Organisation of marketing activity and resource allocation in health services;
- Marketing intelligence in health services market research. Estimating demand in the health services market;
- Pricing strategies. Pricing strategies;
- Expected results in the communication process. Distribution channels in the health services market;
- Application of methods to promote health services - mini-group project;
- Medical imaging technologies and equipment;
- Lasers and robots in medical practice. Platform "George Emil Palade"-minigroup project.

Year II

HISTOLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

2 semesters (56 hours of courses, 84 hours of practical work)

COURSES

- Subject and history of histology. History of histological education in Romania.
- Epithelial cell: general organization, polarity, junctions. Types of epithelial cells.
- Epithelial cover.
- Glandular epithelia.
- Connective tissue cells and fibres.
- Extracellular matrix.
- Connective tissue varieties.
- Cartilage and bone tissue.
- Haematuria, thrombocythemia.
- Leukocytes.
- Hematopoiesis.
- Skeletal muscle tissue.
- Smooth muscle tissue and cardiac muscle tissue.
- Neuron.
- Nerve fibres, synapse, neuroglia.
- Peripheral nerve, spinal and vegetative ganglion, spinal cord, cerebellar crust and cerebral crust. Meninges and choroid plexuses.
- Blood vascular system.
- Heart.
- Lymphatic organs.
- Cell cooperation in the immune response.
- Endocrine glands.
- Oral cavity.
- Esophagus and stomach.
- Small intestine and large intestine.
- Liver in the bile ducts. Pancreas.
- Respiratory system.
- Excretory system.

- Female reproductive system: the ovary.
- Female reproductive system: uterus, fallopian tubes, vagina. Placenta.
- Male reproductive system.
- Skin and flank. Receptor nerve endings in the skin.
- Olfactory mucosa. Eye. Ear.

PRACTICAL WORK

- General organisation of a tissue. The main types of tissues.
- Epithelial covering tissue.
- Glandular epithelial tissue.
- Ultrastructure of epithelial tissues.
- Connective tissue cells and fibres (light microscopy).
- Ultrastructure of connective tissue cells and fibres.
- Connective tissue varieties.
- Cartilage and bone tissue.
- Blood smear. Identification of the figurative blood elements.
- Hematopoiesis.
- Ultrastructure of blood figure elements and hematopoietic lineage cells.
- Muscle tissues: skeletal, cardiac, smooth.
- Ultrastructure of muscle tissues.
- Histological techniques for the detection of nervous tissue. Neuron, nerve fibres, neuroglia.
- Nervous system: peripheral nerve, spinal ganglion and vegetative ganglion, spinal cord, cerebellar crust and cerebral crust. Meninges and choroid plexuses.
- Nerve tissue ultrastructure.
- Heart and blood vascular system.
- Ultrastructure of the cardiovascular system.
- Lymphatic organs.
- Endocrine gland.
- Oral cavity.
- Stomach, oesophagus, small intestine, large intestine.
- Liver and bile ducts. Pancreas.
- Ultrastructural organization of the endocrine glands and digestive system.
- Respiratory system.
- Excretory system.
- Ultrastructural organization of the respiratory and excretory apparatus.
- Female genital tract.
- Male genital system.

- Ultrastructural organisation of the female genital tract and the male genital tract.
- Skin and flank.
- Olfactory mucosa.Eye and ear.

BACTERIOLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

2 semesters (56 hours courses, 56 hours practical work)

COURSES

- General microbiology
  - Subject and history of medical microbiology (eukaryotic and prokaryotic cells; classification of bacteria by shape and arrangement).
  - Bacterial morphology (constant and facultative components of bacterial cells, wall, protoplasts, membrane, mesosomes, inclusions, vacuoles in bacterial cell structure, cytoplasm, nucleus, capsule, spores, flagella, pili).
  - Physiology of bacterial cells (water, minerals and pigments, carbohydrates, proteins and lipids, enzymes and antibiotics produced by bacteria, classification according to respiratory type).
  - Cultivation of bacteria (nutrition, growth factors, optimal growth temperature, substances on which cultivation is carried out, development phases of a culture).
  - The action of physico-chemical factors on bacteria (notions of sepsis and antisepsis, sterilisation and disinfection, sterilisation by moist heat, by dry heat).
  - Antibiotics and chemotherapeutics (bactericidal and bacteriostatic antibiotics, classification of antimicrobial substances by mechanism of action, classification of antibiotics by chemical structure, resistance to antibiotic action).
  - Bacteriophage. Relationships between phage and host bacteria (definitions, structure, lytic cycle, lysogenic cycle, properties of lysogenic bacteria, practical applications of bacteriophagy).
  - Bacterial genetics (DNA, DNA replication, plasmids, F-factor and its role in bacterial conjugation, R and "Col" plasmids, transposable genetic elements, genome, genotype and phenotype, mutations, types of mutations, transformation, transduction, conjugation).
  - Microorganism-host relationships. Pathogenicity and virulence (concepts of symbiosis, commensalism, parasitism, normal microbial flora, pathogenicity, virulence, main factors determining bacterial pathogenicity, exotoxins, endotoxins, anatoxins and antitoxins, components of anti-infective defence).
- Basic immunology
  - Organs and cells of the immune system. Antigens (concept of immune response, central and peripheral organs of the immune system, cells involved, T-lymphocytes, R-lymphocytes, antigens, behaviour of antigens in the body).
  - Immunoglobulins (structure, types, functions, use in diag., heterogeneity of immunoglobulins).
  - Antigen-antibody relationships (general mechanism, precipit. r. in liquid medium, in gel, agglutination r., RFC, serum neutralisation r., r. using labelled components).

- Anticorphogenesis. Intercellular cooperations in the transmission of information on the nature of the antigen (inter leukins, direct cell-cell cooperations, main cell-cell cooperations involved in the immune response, sequence of events up to antibody synthesis).
- Cell-mediated immune response (cell-mediated immune response, cells involved in its realization, phagocytic mononuclear system).
- Humoral hypersensitivity states (definition, anaphylactic r., type II and III hypersensitivity r., serum sickness).
- Cellular-type hypersensitivity states (type IV hypersensitivity, Koch phenomenon, type IV HS testing).
- Inflammation. Evolution of the inflammatory process. Infectious process.

- Bacteriology and medical mycology
  - Pathogenic cocci: genus *Staphylococcus* (general characters, pathogenicity and main diseases, immune response, laboratory diagnosis, antibiotic susceptibility, prophylactic measures).
  - Genus *Streptococcus* (gen. c., gen. c., pathog. c., disease c., immune c., lab. dg., sense to Ab).
  - Genus *Neisseria* (gen. c., pathog. c., disease princ., immune rep., lab. dg., sense. to Ab).
  - Enterobacteriaceae. General characteristics. Genus *Salmonella* (gen. c., pathog. c., disease c., immune c., lab. dg., sense to Ab).
  - Other enterobacteria (gen. c., pathog. c., disease c., immune c., lab. dg., sense. to Ab).
  - Genres: *Pseudomonas*, *Alcaligenes*, *Moraxella*, *Vibrio*, *Campylobacter* (gen. c., pathog. c., disease princ., immun. răs., lab. dg., sense. to Ab).
  - Parvobacteria (c. gen., c. of pathog., c. of disease, c. immune, dg. of lab., sens. to Ab). Mycobacteria (gen. c., pathogen c., disease c., immune response, lab dg., Ab-sensitive).
  - Genus *Corynebacterium*. Genus *Listeria* (gen. c., gen. c., pathog. c., disease c., immune c., lab. dg., Ab-sensitive).
  - Spore-forming gram-positive pathogenic bacilli: aerobic and anaerobic (gen. c., pathogen c., disease c., immune c., lab. dg., Ab-sensitive).
  - Treponemataceae. Genus *Treponema*. Genus *Leptospira*. Genus *Borellia* (gen. c., pathog. c., disease c., immune c., lab. dg., Ab-sensitive).
  - Rickettsii. Chlamydii. Mycoplasma. (c. gen., c. of pathog., c. of disease, c. of disease, c. of immune, dg. of lab., Ab-sensitive).
  - Pathogenic fungi (gen. c., pathog. c., disease c., immune c., lab. dg., Ab sensib.).
  - Vaccinology (definition, classification, importance).

PRACTICAL WORK

- General principles of conduct in the microbiology laboratory. Work protection rules in a microbiology laboratory. Equipment and materials used in the laboratory.
- Sterilisation methods used in the laboratory and medical practice. Use of physical and chemical agents. Other sterilisation methods. Sterilisation control.
- Methods of collection and transport of laboratory samples for microbiological examination.

- Preparation of smears for microscopic examination. Smears from pathological products. Smears from bacterial cultures.
- Microscopic aspects of bacteria. Methylene blue, Gram, Ziehl-Neelsen staining technique.
- Culture media used to isolate bacteria. Aspects of bacterial cultures. Metabolic and pathogenic characteristics of bacteria.
- Antibiotic susceptibility studies of bacteria. Diffusion antigenogram - principle, interpretation.
- Antigen-antibody reactions. General. Precipitation reactions in liquid media.
- Precipitation reactions in gel. Agglutination reactions. Complement fixation reaction. Serum neutralisation reactions.
- Antigen-antibody reactions using marker components.
- Cellular immunity tests. Biopreparations used in medical practice.
- Laboratory diagnosis of bacterial infections. Bacteriological and immunological diagnosis.
- Laboratory diagnosis of staphylococcal infections.
- Laboratory diagnosis of streptococcal infections.
- Laboratory diagnosis of infections caused by bacteria of the genus *Neisseria*.
- Laboratory diagnosis of infections caused by enterobacteria: *Escherichia coli*; *Klebsiella pneumoniae*; *Proteus*; *Enterobacter*; *Salmonella*; *Shigella*; *Yersinia*.
- Laboratory diagnosis of infections caused by bacteria of the genera *Pseudo-monas, Vibrio, Campylobacter*.
- Laboratory diagnosis of infections caused by bacteria of the genera *Coryne-bacterium* and *Listeria*.
- Laboratory diagnosis of infections caused by bacteria of the genus *Mycobacterium*.
- Laboratory diagnosis of infections caused by bacteria of the genera *Trepo-nema, Leptospira* and *Borellia*.
- Laboratory diagnosis of infections caused by bacteria of the genera *Rickettsia, Chlamydia* and *Mycoplasma*.
- Laboratory diagnosis of mycoses.
- Standards for microbiological examination of key laboratory samples.

MEDICAL INFORMATICS AND BIOSTATISTICS

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

1 semester (14 hours of courses, 28 hours of practical ~~work)~~

COURSES

- Computers and their evolution. Personal computers, physical components: motherboard, processor, memory, disk drives, keyboard, monitor, mouse, printers, scanner, compact disks.
- Starting a personal computer. Operating systems. MS-DOS versions prior to version 6. Data volumes, catalogues and files on disks. Formatting a data volume. Main DOS commands.
- Using function keys in *Norton Commander*. Other utilities. Graphical user interfaces. *Windows 3.1* and its resources.
- *Word processing* applications. Controlling pagination, columns, paragraphs, indents. Use of macros, styles and layouts. Preparing a document for faxing.
- Messages, information, codes and Shannon's theory. Codes and data representations. Medical coding. Transmission of information. Applications: archiving.
- Spreadsheets and processing applications. Main mathematical and statistical operations in a spreadsheet. Making graphs and charts. Elements of data analysis: classification, factor analysis and discrimination analysis. (Note: The main statistical applications in medicine - e.g. *EpiInfo* - are included in the Biostatistics optional courses).
- Communications and computer networks. Controlling local networks with *NetWare* and *Windows for Workgroups*. Other operating systems: UNIX. Accessing Internet hosts. E-mail services, Ftp, Archie and surfing the World Wide Web.
- Tables and databases. Table structure, fields and records. Data types. Entering and selecting data. Sorting/indexing records. Creating a report. Application: patient record.
- Computer-based education. Multimedia. Using *Bodyworks.* Computer documentation. Access to MEDLINE. Creating a query and transferring selected data.
- Elements of probability theory. Bayes' theorem. Reasoning, elements of fuzzy logic. Expert systems, components, skeletons. Medical expert systems. Neural networks. Fundamentals of Artificial Intelligence and applications in medical sciences.
- (Optional) Physiological/imaging signals and image processing. Analysis of biological signals with *AcqKnowledge*.

PRACTICAL WORK

- Familiarisation with the personal computer. Keyboard, monitor, floppy disk.
- MS-DOS operating system, I. Catalog information and management.
- MS-DOS operating system, II. File management.
- *Norton Commander* utility.
- *Windows 3.1* Environment Accessories: *Write*.
- *Windows 3.1* environment accessories: *Cardfile*.
- *Word* (version 6) *for Windows*, I. Editing.
- *Word* (version 6) *for Windows*, II. Formatting.

- *Word* (version 6) *for Windows*, III. Sections and tabs.
- *Word* (version 6) *for Windows*, IV. Inserts, tables, statistical graphs.
- *Word* (version 6) *for Windows*, V. Macros and Templates.
- *Excel* (version 5), I. Formulas and copy operations.
- *Excel* (version 5), II. Graphical representations.
- *Excel* (version 5), III. Built-in functions and graphics.
- *Excel* (version 5), IV. Compatibility and spreadsheets.
- Communications, I. Local networks.
- Communications, II. General notions about the UNIX operating system.
- Communications, III. Internet services.
- Communications, IV. Hypertext documents and Web pages.
- Communications, V. Multimedia. Access in MEDLINE.
- Databases, I. Creating and modifying a data table.
- Databases, II. Ordering records.
- Databases, III. Reorganizing and querying a database.
- Databases, IV. Templates, reports and labels.
- Databases, V. Extracting statistical information from data tables.

HUMAN BEHAVIOURAL SCIENCES

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

1 semester (14 hours of courses, 28 hours of practical work)

COURSES

- **Psychosocial module**

- Introduction to the concept of behaviour

  Behaviour and personality. Theoretical models of behaviour. Normal and pathological behaviour. Variables influencing behaviour (biological, psycho-social and cultural), methods of studying behaviour Interactive presentation according to the analytical programme, using data from the literature, examples of clinical cases, including multimedia programmes (Prezi®, Powerpoint®).

– Behaviours harmful to health (alcoholism, smoking, drug use). Risk factors, theoretical explanatory models, clinical manifestations, modalities of therapeutic intervention

- Behaviour in difficult clinical circumstances

  Behaviour of incurable and surgical patients. Behavioural changes related to pain, psychological care of terminally ill patients: specific and ethical dilemmas, burnout syndromes and empathy fatigue: clinical manifestations, therapeutic approaches (e.g. Balint groups).

- Behavioural intervention modalities

  Psychotherapy (PT): effects on patients, doctors and carers

  Short-term, goal-focused PT (definition, theoretical underpinnings, indications, effectiveness), transactional analysis (definition, theoretical underpinnings, indications, effectiveness), transactional analysis (definition, theoretical underpinnings, indications, effectiveness), art therapy (definition, theoretical underpinnings, indications, effectiveness), group and family PT (definition, theoretical underpinnings, indications, effectiveness).

- Biological module

- Principles of hormone-behavior interactions. Hormones and the life cycle

  Optimal hormone concentrations in behavioural determinism. The role of hormones in growth, pubertal sexualization and pregnancy, hormones and aging. Hormones and sleep.

- Hormones and sexual behaviour

  Gender identity, the cycle of sexual response. Sexuality in special periods: chronic illnesses, the elderly.

- Eating behaviour. Hydroelectrolyte balance and fluid intake

  Hypothalamic nuclei with a role in regulating feeding behaviour. Orexigenic and anorexigenic hormones. Hormones involved in the maintenance of water and electrolyte balance.

- Stress and the role of hormones in stress

Definition of stress. Hormones involved in stress response: catecholamines, hypothalamic-pituitary-adrenal axis hormones. Regulatory factors of the hormonal response to stress. Stress in disease determinism.

PRACTICAL WORK

- Psychosocial module
  - Human behaviour - a biopsychosocial complex with implications for preserving or altering health

    Biological basis of behavior, genetic-environmental-behavior interaction, neuroanatomical basis of some behaviors;

    Interactive presentation using psychological tests, case presentations, literature data, including multimedia (Powerpoint®)

  - Variables influencing behaviour (gender, age, socio-cultural background)

    Clinical applications:testing cognitive abilities in the elderly using the MMSE test, Green questionnaire for assessing behavioural changes in menopause, interview focused on the importance of the socio-cultural environment on compliance in chronic diseases

  - Behaviours harmful to health

    Algorithm for dealing with patients who intend to quit smoking, questionnaire for assessing psychogenic obesity, dealing with drug addicts and patients facing domestic violence

  - Behavioural aspects of dealing with challenging clinical circumstances

    Stigma, burden and challenge for certain categories of patients. Pain - psychometric assessment of its impact in chronic and incurable diseases. Interviewing chronic patients, with a focus on the importance of perceived social support.

  - Behaviour of the doctor and medical team

    Interview focusing on the difficulties doctors face in dealing with patients and the risk of burnout. Balint groups as a way of tackling burnout syndrome in doctors

  - Psychotherapy as an adjunct to medical intervention focused on changing abnormal and risky behaviours

    Theoretical principles. Clinical examples (case studies).

- Biological module
  - Assessment of sexual behaviour, dietary behaviour, water-electrolyte balance and stress response in patients with endocrine pathology

Year III

MEDICAL SEMIOLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

2 semesters (56 hours of courses, 112 hours of practical work)

COURSES

- The place and importance of semiology.
  - Clinical and non-clinical medicine. Definition of medical semiology. Symptom. Sign. Syndrome. Examples. Value of symptoms and signs: sensitivity, specificity, etc.
  - Medical record. Ananemnesis: marital status data, reasons for admission, history of current suffering, personal and hereditary history. Living and working conditions, possible environmental pathogenic factors, diet, toxic: smoking, alcohol, etc.
  - General symptoms: fever and clinical types of fever, hypothermia; inappetence-anorexia, asthenia, hyperdiuresis, insomnia, headache.
- General examination:
  - General inspection (overview of the patient): attitude of the patient (pathological decubitus), facies (different types of facies), stature (dwarfism, gigantism). Constitution, constitutional type. Nutritional status (emaciation and obesity). Mental state: coma and related states, convulsions, delirium.
  - Semiology of visible tegument and muzzle
    - ⇒ Changes in the colour of the skin: pallor, jaundice, cyanosis, etc.
    - ⇒ Cutaneous hyperchromias and achromias: localized, regional, generalized
    - ⇒ Elementary lesions of the tegument with examples:

      Semiology of the cutaneous appendages: semiology of pilosity

      Semiology of nails

      Semiology of sweat and sebaceous glands

      Semiology of subcutaneous tissue
  - Semiology of hyperhydration and dehydration:Oedema-clinical types of oedema: cardiac, renal, "hunger", hepatic, inflammatory, allergic, lymphatic, etc., extra- and intracellular dehydration, intracellular hyperhydration (causes, clinical signs, biological).
  - Skeletal muscle semiology: symptoms and signs that point to muscle disorders. Examples
  - Semiology of bones: symptoms and signs of bone disease. Mono- and poly-osseous conditions. Generalised osteopathies: osteoporosis, osteomolysis, fibrocystic osteopathy, renal osteopathy.
  - Semiology of joints. Symptoms and signs of joint disorders. Examples: arthropathies in: acute articular rheumatism, rheumatoid arthritis, ankylosing spondylitis, reactive arthritis, microcrystalline arthritis (gout), degenerative rheumatism, abarticular rheumatism, sciatica through disc lesions, scapulohumeral periarthritis.
  - Lymph node semiology: adenomegaly, adenopathy, lymph node examination technique. Paraclinical diagnostic methods in adenopathy. Examples of regional and generalized, inflammatory and tumoral adenopathies.
- Respiratory semiology
  - Main respiratory diseases. Terminology. Main aetiological factors of bronchopneumopathy.
  - The main symptoms of respiratory diseases:
    - ⇒ Chest pain: chest pain, congestion.
    - ⇒ Dyspnoea of respiratory cause and respiratory dysrhythmias.
    - ⇒ Cough and expectoration. Macroscopic examination of sputum.
    - ⇒ Vomica
    - ⇒ Hemoptysis
    - ⇒ Fever in respiratory diseases.

⇒ Cyanosis (see discoloration of the skin)

- Objective examination of the respiratory system
  - ⇒ The value of general inspection for respiratory diseases
  - ⇒ Static and dynamic inspection of the chest (including inspection of the anterior cervical region and abdominal movements).
  - ⇒ Chest palpation: static, dynamic, vocal vibration palpation.
  - ⇒ Chest percussion: history. Main sounds of perception: sonorous, mat, tympanic. Dullness in lung and pleural disorders, hypersonicity and tympanicity in lung and pleural disorders. Physical basis of lung percussion.
  - ⇒ Listening to the respiratory system. History. The two noises perceived on the normal respiratory apparatus: laryngo-tracheo-bronchial noise (laryngo-tracheal noise), vesicular murmur. Mechanisms of production. Changes in vesicular murmur. Pulmonary murmurs. Overadded lung sounds. Nomenclature. Modern classification of rales. Rales: humming, hissing, sub-screpitus, crackling, particular types of rales; description, significance. Classical and modern conceptions of the mechanism of production and significance. Superadded pleural noises: pleural rubs, rales-rumbles, clinking, metallic. Description, meaning.
  - ⇒ Combined respiratory examination methods
  - ⇒ Percussion combined with listening (classical methods, modern listening percussion), percussion combined with succussion (Hippocratic succussion)
- Complementary respiratory examination methods
  - ⇒ Radiological exploration methods: radioscopy and standard radiography, frontal plane tomography, computed tomography, etc.
  - ⇒ Functional methods of respiratory examination: determination of Po2, Pco2, pH, spirography.
  - ⇒ Sputum examination: cytology, enzymophilia, bacteriological examination, cultures, BK in sputum, elastic fibres, etc.
  - ⇒ Puncture and pleural biopsy.
  - ⇒ Pleural fluid examination
  - ⇒ Respiratory syndromes
- Bronchial syndromes: acute bronchitis, chronic bronchitis, bronchial asthma
- Pulmonary syndromes: pulmonary condensation syndrome in: pneumococcal pneumonia, bronchopneumonia, interstitial pneumonia, pulmonary infarction, lung cancer, atelectasis (shrinking condensation syndrome).
- Pulmonary hyperinflation: generalities. Pulmonary emphysema: morpho-pathological type, clinical signs, COPD, type A and B.
- Cavity syndrome: typical, frustrated, with amphoric-metallic signs. Modern diagnostic methods.
- Bronchopulmonary suppuration syndrome, bronchiectasis.
- Pleural syndromes:
  - ⇒ Dry pleurisy syndrome.
  - ⇒ Pleural fluid syndrome.
  - ⇒ Pneumothorax syndrome
  - ⇒ Pachypleuritis syndrome
  - ⇒ Mediastinal syndromes: anatomo-clinical typing of the mediastinum. Symptoms and signs of topographic mediastinal syndromes and chronic acute mediastinal syndromes. Chronic respiratory failure syndrome.

- Cardiovascular semiology. Main diseases of the cardiovascular system. Terminology. Main etiological factors of cardiovascular diseases.
  - Main symptoms of cardiovascular diseases.
    - ⇒ Pain of cardiac and vascular origin: coronary pain, pre-cardiac pain, intermittent claudication.
    - ⇒ Dyspnea of cardiac origin, Chyene-Stokes breathing.

    - ⇒ Palpitations
    - ⇒ Cardiac oedema (see general semiology)
    - ⇒ Other symptoms in heart disease: lipotomy, syncope, fever.
  - Objective examination of the cardiovascular system
    - ⇒ General examination in heart patients
    - ⇒ Inspection of the precordial and anterior cervical region.
    - ⇒ Palpation of the heart: apex shock, abnormal pulsation, quivering.
    - ⇒ Heart percussion: technique, results.
    - ⇒ Listening to the heart: normal heart sounds, listening areas of the heart. Heart listening technique. Pathological changes in heart sounds. Rhythms in 3 (three) beats. Blowing. Classification and meaning. Precardiac frequency. Mechanisms of production of normal and pathological heart sounds. Audio examples.
    - ⇒ Examination of arteries and veins. Pulse and its changes. Blood pressure measurement technique.
    - ⇒ Palpation and vascular asultation: technique, interpretation.
    - ⇒ Examination of veins: jugular, parietal veins.
  - Paraclinical methods of examination of the cardiovascular system.
  - Non-invasive investigation.
    - ⇒ Electrocardiogram, EKG Holter
    - ⇒ Radiological examination (not to be insisted, it is taught in the radiology discipline)
    - ⇒ Echo-cardiographic and echo-Doppler examination of the heart.
    - ⇒ Other non-invasive examinations: phonomechanograms, oscillometry, vascular Doppler.
  - Invasive investigation: cardiac catheterization, angiocardiography, electrogram-endocavitary, etc.
- Cardiovascular syndromes
  - Valvulopathies. Mitral stenosis and insufficiency syndromes.
  - Aortic stenosis and insufficiency syndromes.
  - Right heart valve diseases: tricuspid and pulmonary.
  - Rhythm and conduction disorders (arrhythmic syndromes)
  - Pathophysiological mechanisms of rhythm disorders. Sinus tachycardia. Sinus bradycardia. Sick sinus syndrome. Extrasystoles. Paroxysmal supraventricular tachycardia. Atrial flutter. Atrial fibrillation. Ventricular tachycardia. Ventricular fibrillation. Ventricular flutter. Atrioventricular blocks and Adams-Stokes syndrome. Branch blocks.
- Myocardial ischemia syndromes
  - Elements of pathophysiology - etiology. Clinical forms of ischemic cardiology. Angina pectoris: stable angina and unstable angina. Acute myocardial infarction. Positive and differential diagnosis of myocardial ischemic pain.
- Heart failure syndrome
  - Etiology. Left heart failure. Right heart failure. Global heart failure.
- Pericardial syndromes
  - Classification. Dry pericarditis syndrome. Fluid pericarditis syndrome. Cardiac tamponade. Constrictive pericarditis syndrome.
- Hypertension syndrome
  - Definition. Classification. Essential and secondary hypertension. ETS studies. Symptoms and signs. Objective examination. Paraclinical examinations.
- Myocardial syndrome: myocarditis, cardiomyopathies.
- Peripheral vascular syndromes
  - Acute arterial obstruction syndrome.
  - Chronic obstructive pulmonary disease.
- Venous syndromes (studied in surgery).
- Digestive system semiology

- Main symptoms in digestive pathology. Dysphagia. Pyrosis. Abdominal pain (epigastralgia, colic, acute peritoneal pain, pain from acute pancreatitis, ischemic pain - mesenteric intestinal infarction, pain from perivisceritis). Nausea. Vomiting. Changes in appetite: inappetence, anorexia, perversions of appetite, bulimia, hyperphagia, etc.). Diarrhoea. Constipation.
- Clinical examination
- Inspection and palpation of the oral cavity and oropharynx. Inspection, palpation, percussion and listening of the abdomen.
- Paraclinical investigations of the digestive system.
- Radiological examination. Endoscopic examination. Biopsy examination. Ultrasound examination. Computerized topography. Biological samples. Biochemical samples.
- Digestive syndromes: oesophageal syndrome, gastric dyspeptic syndromes, pyloric stenosis syndrome, diarrhoea syndrome, constipation syndrome.
- Clinical examination of the liver, bile ducts and pancreas.
- General examination in liver and pancreatic diseases.
- Inspection and palpation of the liver
- Paraclinical methods of liver examination: imaging, liver functional investigation, liver biopsy puncture
- Jaundice syndrome.
- Acute and chronic liver failure syndrome.
- Portal hypertension syndrome.
- Ascites syndrome.

- Semiology of the nephro-urinary system
  - Nephrological history and fixed examination of the nephro-urinary system.
  - The main symptoms and clinical signs indicating nephro-urinary system distress.
    - ⇒ Nephro-urinary pain (urethral colic, acute and chronic renalgia, bladder, urethral, prostatic and epididymal pain).
    - ⇒ Diuresis disorders (polyuria, oliguria, anuria, nocturia, opsiuria).
    - ⇒ Urination disorders (polyuria, urinary frequency, dysuria, urinary retention, urinary incontinence).
  - Paraclinical exploration of the nephro-urinary system
    - ⇒ Urine examination (macroscopic, physiochemical, microscopic, bacteriological, quantitative of cells and cylinders).
    - ⇒ Renal function exploration (creatinine clearance and creatinuria, urine concentration and osmolarity test, urine acidification test).
    - ⇒ Nephro-urinary imaging exploration (radiological and computed tomography, radioisotope, nuclear magnetic resonance).
    - ⇒ Kidney biopsy.
  - Major nephrological signs
    - ⇒ Proteinuria
    - ⇒ Haematuria
    - ⇒ Picmenturia
    - ⇒ Pyuria and cholera, Bacteriuria
  - Major nephrological syndromes
    - ⇒ Renal oedema (see general semiology)
    - ⇒ Renovascular hypertension
    - ⇒ Nephrotic syndrome
    - ⇒ Acute renal failure syndrome
    - ⇒ Chronic renal failure syndrome. clinico-biological picture of uremia.
  - Clinical syndromes produced by the main groups of nephropathies.
    - ⇒ Acute glomerular nephropathy syndrome
    - ⇒ Chronic glomerular nephropathy syndrome

⇒ Chronic tubular nephropathy syndrome
⇒ Acute tubulointerstitial nephropathy syndrome
⇒ Chronic interstitial nephropathy syndrome
⇒ Urinary nephropathy syndrome
⇒ Vascular nephropathy syndrome

- Semiology of the hematopoietic system
  - Clinical symptoms and signs in blood diseases
  - Anaemic syndromes
  - Haemorrhagic syndromes
  - Adenomegalic syndromes (see general semiology)
  - Splenomegalic syndromes
- Rheumatism semiology (see general semiology)

PRACTICAL WORK

- Observation sheet - forensic, scientific, teaching document, component parts of the observation sheet
- Anamnesis in general: anamnesis technique. Psychological aspects of approaching the patient.
- Semiological data obtained by general inspection, attitude, facies, stature, nutritional status, constitutional types)
- Semiology of tegument and mucous membranes (main aspects).
- Osteo-articular semiology. Main aspects.
- Semiology of the lympho-ganglionic system (main aspects, clinical examination). Elements of neuropsychological semiology.
- Complete the general examination. Drawing up the observation sheet (anamnesis, general examination).
- Analysis of the main symptoms of respiratory distress (chest pain, dyspnoea, cough, sputum, haemoptysis, respiratory distress).
- Semiological data by chest inspection (normal conformation, deformities, analysis of respiratory movements, normal respiratory patterns, changes in respiratory rhythm).
- Respiratory palpation technique. Chest palpation data (normal and pathological).
- Percussion - percussion technique, semiological data obtained by percussion of the respiratory system.
- Respiratory listening technique and the main semiological changes obtained by listening (normal and pathological vesicular murmur, pulmonary sulphurs, rales, pleural friction, voice listening).
- Examples of the practical use of complimentary methods of examination of the respiratory system (e.g. radiological, sputum examination, e.g. pleural fluid, spirography).
- Lung condensation syndrome (pneumonia, bronchopneumonia, lung cancer, pulmonary infarction, atelectasis).
- Bronchial syndrome and pulmonary suppuration syndrome, acute and chronic bronchitis, bronchiectasis, lung abscess.
- Alveolar distension syndrome (bronchial asthma, pulmonary emphysema), cavitation syndrome, pneumothorax, mediastinal syndrome.
- Pleural syndromes (pleuritis, pleurisy, hydrothorax).
- Analysis of the main symptoms of cardiovascular distress (dyspnoea of cardiac origin, cardiac pain, palpitations, oedema, cardiac oedema, cyanosis of cardiac origin, syncope, lipotimia, intermittent claudication).

- Techniques of inspection, palpation and percussion of the heart and vessels, semiological data obtained by these methods.
- Heart and vessel listening technique (normal heart sounds, listening foci, three-beat rhythms - mainly global murmurs, inorganic murmurs, continuous murmurs, gallop murmurs of insufficiency and valvular stenosis, organic murmurs, continuous murmurs, periocardial and pleuro-pericardial friction).
- Examples of the practical use of the main complementary methods of cardiovascular examination (e.g. radiological, ECG, phonocardiogram, venous pressure, echocardiography).
- Rhythm and conduction disorders (sinus arrhythmia, extrasystolic arrhythmia, atrial fibrillation, sinus tachycardia, paroxysmal tachycardia, sinus bradycardia, complete atrioventricular block, Adams-Stoks syndrome).
- Valvular syndromes (mitral, aortic, pulmonary valve insufficiency).
- Pericardial syndromes (dry, fluid, constrictive pericarditis).
- Myocardial ischemia syndromes (angina pectoris, impending heart attack, myocardial infarction).
- Acute and chronic peripheral ischemia syndrome. Hypertension and hypotension.
- Heart failure syndrome (left, right and global).
- Analysis of the main symptoms of digestive distress (dysphagia, various types of abdominal pain, pyrosis, nausea, vomiting, regurgitation, loss of appetite, constipation, diarrhoea, haematosis, melena).
- Inspection and percussion technique of the digestive system. The main semiological data obtained by these methods (the importance of general inspection will be emphasised and the fact that inspection of the digestive system begins with examination of the oral cavity).
- Abdominal palpation technique (abdominal wall palpation and highlighting of painful points, superficial and deep topographic palpation, muscle aperation, abdominal rumor palpation technique, liver and spleen palpation).
- Examples of the practical use of complementary methods of examination of the diphtheritic apparatus (gastric chemism, duodenal tube, coprological ex., radiological ex., endoscopic and bioptic methods, radioisotope ex., functional liver and pancreatic samples, abdominal ultrasound).
  - Dyspeptic syndromes, ulcerative disease.
  - Diarrhoea and constipation syndrome.
- Neoplasia of the digestive system.
- Jaundice syndrome.
- Ascites and portal hypertension syndrome.
- Liver failure syndrome.
- Hepato-splenomegalic syndromes.
- Analysis of the main symptoms of uro-genital distress (renal colic, bladder urgency, urination disorders, diuresis disorders, pyuria, haematuria, renal oedema, manifestations of other apparatus in renal disorders).
- Data obtained by general and lumbar inspection, listening to the renal artery, palpation technique of the kidney, bladder, investigation of ureteral pain points, data obtained by inspection and palpation of the external genitalia.
- Study of normal and pathological urine.
- Examples of the practical usefulness of complementary methods of examination of the uro-genital apparatus (humoral determinations, urea, creatinine, uric acid, clerance, intravenous

urography, leucocyturia and hematuria minuted, dilution and concentration sample, serum and urinary ionogram.

- Glomerular nephropathy syndrome (acute diffuse glomerulonephritis will be emphasized).
- Nephrotic syndrome.
- Tubular and interstitial nephropathy syndromes.
- Acute and chronic renal failure syndrome.
- Semiology of inflammatory arthropathies.
- Semiology of degenerative arthropathies.
- Main results obtained by paraclinical examination methods of the locomotor system.
- Anaemic syndromes (hyperchromic, hypochromic, haemolytic anaemias.
- Haemorrhagic syndromes, adenomegalic syndromes.
- Main results obtained by paraclinical methods (haemolucogram, myelogram, coagulability samples, usefulness of bone marrow and lymph node biopsies).

PHARMACOLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

2 semesters (56 hours courses, 56 hours practical work)

COURSES

- Introductory lesson
  - The position of pharmacology as an experimental and applied discipline, the link with other medical disciplines and the drug industry, the history of pharmacology.
- General Pharmacology
  - General pharmacokinetics: absorption, distribution and clearance of drugs, pharmacokinetic parameters and their dynamics, pharmacokinetic interrelationships.
  - General pharmacodynamics: the action of drugs at the molecular and cellular level and on different systems and devices.
  - Pharmacotoxicology and adverse reactions: drug intoxications and their treatment, adverse reactions and pathological conditions produced by drugs, environmental problems raised by the uncontrolled development of medication, drug abuse and its economic and social implications, pharmacovigilance.
  - Drug research methodology: experimental and clinical research, evaluation of new drugs, drug regulations.
- Vegetative medication
  - Chemical mediators
  - General information on substances with actions in the celinergic field: parasympathomimetics, antocholinesterases, (including toxicological importance), parasympatholytics, ganglionics, curarizers.
  - General information on adrenergic substances: sympathomimetics, sympatholytics (alpha-adrenergic inhibitors), beta-adrenergic inhibitors, sympathetic end blockers).
- Termination of sensory nerves and neuromotor units
  - Local anaesthetics.
  - Curatives and myorelaxants.
- Central nervous system medication
  - General anaesthetics: inhalation anaesthetics, intravenous anaesthetics, ethyl alcohol (including alcoholism and its consequences).
  - Hypnotics.
  - Psychotropics: psychomotor stimulants, tranquilizers sedatives, neuroleptics antidepressants, psychotomimetics (including toxicological significance)
  - Opioid analgesics and antagonists.
  - Antipyretic and anti-inflammatory analgesics, anti-rheumatic, anti-tobacco medication.
  - Central motor depressants: antiepileptic, antiparkinsonian.
- Metabolic humoral
  - Tissue active substances and antagonists: histamine and antihistamines (anti-H1anti-H2), serotonin and antiserotonins, kinins and prostglandins antagonists, leukotrins and antagonists.
  - Hormonal and antihormonal substances, used as medicine: glucocorticoids, synthroid antithyroid, synthroid antidiabetics.
- Medication of various effector devices and systems (20 hours)
  - Circulatory system medication: tonicardiac and other heart stimulant drugs, antiarrhythmics, antianginal, vasoconstrictive and antihypotensive drugs, antiischemic vasodilators, antihypertensives, hypolipidaemic medication
  - Blood medication: antianemics, haemostatics, antithrombotic medication (anticoagulants, thrombolytics, antiplatelet agents), colloidal plasma substitutes.

  - Digestive system medication: antacids (antacids, gastric secretion inhibitors, mucosal and ulcerative lesion protectors), stimulants and substimulants of digestive secretion, antivomaticides, purgatives, antidiarrhoeals, antispasmodics, antiflatulents.
  - respiratory medication: cough and expectorants, anti-asthmatics.
  - Diuretics
  - Oxytocic and tocolytics, drugs and pregnancy.
- Chemotherapies and antibiotics (8 hours)
  - Anticancer chemotherapeutics and immunosuppressants: alkylating agents, metabolic analogues, toxic spindle alkaloids.
  - Antibiotics and antibacterial chemotherapeutics: penicillins, cephalosporins, erythromycin, aminoglycosides, tetracyclines and chloramphenicol, polymyxins, antituberculosis chemotherapeutics, antibacterial sulfonamides and trimethoprim, urinary antiseptics.
  - Chemotherapeutics active in mycoses, viroids and diseases caused by protozoa, anthelmintics.

PRACTICAL WORK

- General information on prescribing medicines (6 hours)
  - Medicinal forms
  - Prescribing and prescribing medicines
- Practical work and demonstrations of general pharmacology (4 hours)
  - Pharmacokinetic issues: drug absorption, plasma protein binding, enzyme induction, drug elimination.
  - Pharmacodynamic issues: types of pharmacological actions, quantitative testing of pharmacological effects.
  - Pharmacotoxicology issues: toxic effects of drugs (acute, subacute and chronic toxicity, treatment of acute intoxications), adverse drug reactions, pharmacovigilance.
- Highlighting the effects and prescribing of drugs acting on the vegetative nervous system
  - Highlighting the pharmacological and toxic effects of adrenergic acting substances.
  - Highlighting the pharmacological and toxic effects of cholinergic substances.
  - Demonstration of toxic and lethal effects of organophosphorus anticholinesterases (including antagonism by anticholinergic substances and cholinesterase reactivators).
  - Prescription of drugs with vegetative action: presentation of standardised preparations, prescriptions of magistral and standardised preparations.
- Highlighting the effects and prescribing of central and peripheral system drugs
  - Central nervous system stimulants: pharmacological and toxic actions of coffee, amphetamine, and strychnine; receptors.
  - General anaesthesia and general anaesthetics: bilogic narcosis, phases of general anaesthesia, peculiarities of action of some general anaesthetics, accidents of anaesthesia.
  - Tranquilizers and neuroleptics: tranquilizing action, neuroleptic syndrome; receptor.
  - Hypnotics and anticholvulsants: barbiturate sleep, acute barbiturate intoxication and its treatment, anticholvulsant properties of phenobarbital; receptors.
  - Opioid analgesics: analgesic action of morphine, depression of respiration by morphine and other adverse reactions; receptor
  - Antipyretic and anti-inflammatory analgesics: analgesic action, antipyretic action, anti-inflammatory action; receptor.
  - Local anaesthetics: local anaesthesia and types of local anaesthesia; receptors. Curing agents: curing action and curing, site and mechanism of action of curing agents.
- Effects and prescription of drugs acting on different effector systems and apparatus
  - Tonicardiacs and antiarrhythmics: tonic action, toxic phenomena caused by tonicardiacs, antiarrhythmic action, receptors.
  - Vasodilators and vasoconstrictors: nitrates as vasodilators and antianginal, drugs used in the treatment of hypertension, antiischemic vasodilators, vasoconstrictors; receptor.

- Antispasmodics: types of antispasmodics (atropine, papaverine), antispasmodic action experimental models of smooth muscle spasm; receptor.
- Histamine and antihistamines: vasodilatory and hypotensive action of histamine, bronchospastic action and antagonization by antihistamines; receptor.
- Digestive system medication: neutralizers and gastric secretion inhibitors, antispasmodics, purgatives; receptants.
- Respiratory tract medication: bronchodilators, expectorants, antitussives, respiratory stimulants; receptors.
- Blood medication: anticoagulants, thrombolytics, antiplatelet, antihemorrhagic, antianemic; receptors.
- Diuretics: diuretic action and mechanism, types of diuretics; receptor.
- Oxytocic and tocolytics: oxytocic action, tocolytic action, adverse reactions in the use of oxytocic in clinical conditions; receptivity.

- Prescribing antibiotics and chemotherapy
- The practice of rational choice of medicines and therapeutic regimens in clinical settings

PATHOPHYSIOLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

2 semesters (56 hours courses, 56 hours practical ~~work~~)

COURSES

- Pathophysiology of haemostasis
  - Primary haemostasis - local haemodynamic changes, platelet adhesion, mechanisms of platelet metabolic activation and platelet aggregation, viscous metamorphosis. Haemostasis disorders caused by structural abnormalities of the vaascular walls - Henoch-Schonlein purpura, hereditary haemorrhagic telangiectasia, Ehlers-Danlos syndromes, hypovitaminosis C.
  - Disorders of haemostasis by thrombocytopenes - megakaryopoiesis (biology of differentiation and proliferation/maturation sectors, polyploidy), thrombocytopenes by altered proliferation/maturation of medullary precursors, thrombocytopenias by intrasplenic sequestration, thrombocytopenias by peripheral platelet destruction (acute/chronic idiopathic thrombocytopenic pyuria, DIC, thrombotic thrombocytopenic purpura or Moschowitz disease). Disorders of haemostasis by thrombocythemia. Platelet haemostasis disorders: secondary (CKD, monoclonal gammopathies) and primary (haemorrhagic thrombocyte dystrophy, von Willerbrand pseudodisease, Glanzman thrombasthenia, platelet storage tank disease, Gray syndrome). Physiological coagulation. Coagulopathies due to isolated coagulation factor deficiencies-haemophilia, haemophyloid syndromes, von Willebrand disease, aphrinogenemia.
  - Coagulopathies through associated deficiencies of several coagulation factors. Hypovitaminosis K (circuit and metabolism of vitamin K, mechanisms of action, causes of hypovitaminosis, consequences), haemostasis disorders in parenchymal decompensated liver failure (thrombocytopenia, coagulopathy, fibrinolysis disorders), disseminated intravascular coagulation syndrome, intrinsic, extrinsic pathway activity, thrombocytopenia, consumptive coagulopathy, fibrinolysis disorders, thromboembolic disease.
- Inflammation
  - Definition, calcification/etiology and staging of inflammatory reactions. Acute inflammation: general outline of the course of RIAc. Professional cells of inflammation: neutrophils, monocytes/macrophages, eosinophils. Functions of phagocytes and mechanisms of their activation: adhesion (selectins, immunoglobulin superclass receptors, intergrins), neutrophil activity, monocyte activity, chemotaxis/chemokinesis, phagocytosis, bactericidal ($O2$-independent lineage mechanisms).
  - Accessory cells of inflammation: mast cells/bazophils (distribution, mechanisms of activation, prophlogistic mediators and non-metabolites), endothelial cells (EDRF, HGI, PGE, angiotensin, endothelins, endothelium and haemostasis, endothelium and leukocyte trafficking), platelets (mechanisms of their activation, prophlogistic mediators), lymphocytes - general principles.
  - Soluble mediators of RIAc: histamine - physicochemical properties, synthesis, structure, histamine release, histamine receptors, effects: serotonin - synthesis, catabolism, storage, effects; eicosanoids - cyclooxygenase pathway, lipokinase pathway, transcellular

metabolism, effects; platelet activating factor - biosynthesis, catabolism, effects; Plasma kinin system - kallikreins, kininogens, direct and indirect effects; complement system - pathways, activators, anaphylatoxins and their mechanisms of action; various mediators in inflammation; cytokines and inflammation (IL1, TNF, IL6, IL8, SIS proteins, RANTES etc).

- Vascular changes in inflammation and mechanisms of oedema formation: vasodilatation and increased capillary permeability, actions of soluble prophlogistic and hormonal factors; integrative presentation of lytic mechanisms in acute inflammatory foci. Post-inflammatory tissue repair: tissue re-epithelialisation/renewal, fibroplasia and scar contraction, angiogenesis, scar-tissue remodelling.
- Pathology of inflammation: leukopenia of central and peripheral origin (alteration of mitotic or storage compartment, increased extravascular utilization, destruction and sequestration of leukocytes); effects of leukopenia on RIAc dynamics: monocyte disorders - Chediack-Hiagashi syndrome, myeloperoxidase deficiency, storage deficiency, chronic granulomatous disease, malignant diseases: adhesion disorders, chemoattractant factor disorders, phagocytic capacity and bactericidal disorders. Pathology of inflammation: principles of immunological inflammation (by IgE, by cytotoxic Ac, by immune complexes and by cell mediation); changes in diabetes mellitus, in thyroid diseases, glucurtucoid treatment; relationship inflammation - non-specific immunity (principles) and acute inflammation, chronic inflammation. Protein metabolism
- Fixiopathology of systemic post-stroke reaction. The vageta-endocrine reaction.Sympathoadrenergic stimulation. Endocrine reaction (hormones: adrenocorticotropic, antidiuretic, thyroid, glaucoma, insulin). Hemodynamic changes. metabolic phase, corticoid decline phase, anabolic phase).
- Shock states
- Defining the concept. Hemodynamic disturbances. Hypovolemic shock. Absolute, relative hypovolemia. Decrease in vascular bed size. Increased blood volume and vascular bed size. Acidosis. Histamine. Plasma kinins. Prostglandins. Nitric oxide. Endorphins. Invascular blood sequestration. Intravascular erythrocyte aggregation, DIC. Disorders of cardiac activity. Myocardial depressor factor. Cardiogenic shock. Infectious shock. Metabolic disturbances in shock (carbohydrate, lipid, protein, energy, water-electrolyte balance, sodium, chloride, potassium, calcium, water, acid-base balance). Cellular, visceral "shock organs" consequences (lungs, gastrointestinal tract, liver, pancreas, kidney). Staging of shock states. irreversible shock.
- Chronic shock.
- Multiple organ dysfunction syndromes.
- Pathophysiology of glucose metabolism disorders.
- Pathophysiology of the glucose penetration system into cells. Glucose intolerance. Renal diabetes. Postreceptor form of diabetes mellitus. Increased hexokinase activity.
- Glycogenase pathophysiology
- Pathophysiology of the oze-to-glucose deficiency transition.
- Glycogenase pathophysiology.
- Glycolysis pathophysiology. Decreased glycolysis activity. Glucolysis activity waxing.
- Pathophysiology of pyruvic acid decarboxylation.
- Glycogenase pathophysiology.

- Pathophysiology of glycogenogenogenesis. Glycogen deficiency.
- Pathophysiology of pentotic shunt.
- Pathophysiology of the glucuronic acid pathway.
- Pathophysiology of diabetes. Pathophysiological basis of diabetic heteroncity. Pathophysiology of metabolic disorders in diabetes mellitus. Chronic complications, acute-physiopathological complications.
- Pathophysiology of hypoglycaemia. Inhibition of hepatic glycogenolysis and neuglycogenolysis by insulin. Depletion of hepatic glycogen stores. Impairment of neoglucogenesis. Stages of cortical, subcorticodiencephalic, mesencephalic, premielencephalic, myelencephalic hypoglycaemia. Insulinoma. Reactive or functional hypoglycaemia. Ethylic hypoglycaemia.

- Pathophysiology of lipid metabolism
  - Physical-chemical characteristics of the main lipoprotein fractions - chylomicrons, VLDL, LDL, and HDL. chylomicron circuit, VLDL fraction circuit. LDL and HDL fraction circuit. Hyperlipemias - general. Primary monogenic hyperlipemias - familial LPL deficiency, familial hypercholesterolemia familial Apo-CII deficiency, type III hyperipoproteinemia, familial hypertriglyceridemia.
  - Polygenic hyperlipoproteinemias - polygenic hypercholesterolemia, sporadic hypertriglyceridemia.
  - Secondary hyperlipoproteinemia in diabetes mellitus, nephrotic syndrome, cirrhosis of the liver, hyper/hypothyroidism. Primary hypoliproteinaemias - Tangier disease and abetalipoproteinaemia.
  - Pathophysiological mechanisms of sterogenesis: types of lipoproteins that predispose to the risk of sterogenesis; endothelial changes, role of peroxidation processes, immune mechanisms, implications of mono-macrophages and platelets in atherogenesis; loco-regional consequences of the presence of atheromatous plates.

- Hydro-electrolyte metabolism
  - Hyponatremia: definition, general mechanisms of hyponatremia, classification and etiology of hyponatremia, pathophysiological classification iso-hyper, hypotonic), paraclinical classification by dilution, by depletion), isotonic hyponatremia, hyponatremia
  - K capital of the body, compartments, role of hormonal factors (insulin, catecholamines, aldosterone), acid-base balance and renal function on K capital/distribution in the body.
  - Hypokalaemia: definition (hypokalaemia versus K depletion). Pathophysiology of hypokalaemia in alkaloids, insulin therapy, periodic paralysis, intake deficiency, gastrointestinal losses, renal losses, K depletion without hypokalaemia, K depletion with hypokalaemia.
  - Hyperkalemia: renal and extrarenal mechanisms; altered renal excretion of K organic and functional tubular defects. Mineralocorticoid deficiency, renin secretion defect, type IV renal acidosis, altered interstitial K distribution, hyperkalaemia in metabolic decompensated diabetes mellitus, in EAB disorders; consequences of hyperkalaemia at the cellular level.
  - The body's water sectors and compartments (total, intracellular, extracellular fluid - values, composition, functions). Interstitial hydroionic changes (LIC/LRC , plasma/interstitial fluid). H_2O-Na depletions (dehydrations) - hypertonic, isotonic, hypotonic; H_2O-Na

expansions (retentions) (hyperhydrations) - hypertonic, isotonic, hypotonic. Hemodynamic consequences of volemic depletions and expansions.

- Acid-base balance pathophysiology
  - General mechanisms of EAB homeostasis - buffer systems, respiratory function, renal function. Pathophysiological classification of acidosis, paraclinical classification of acidosis. Metabolic lactic acidosis in shock states, lactic acidosis type B, acidosis in acute alcohol intoxication, ketoacidosis in metabolically decompensated diabetes mellitus.
  - Distal renal tubular acidosis (ART), proximal ART, metabolic acidosis by digestive bicarbonate loss; metabolic alkalosis by primary H+ deficiency, metabolic alkalosis by primary bicarbonate accumulation.
  - Acute and chronic respiratory acidosis - aetiology, compensatory mechanisms by bicarbonate buffer systems, haemoglobin, renal activity, importance of hyperlactacidaemia.
  - Respiratory alkalosis - aetiology, compensatory mechanisms through buffer systems, haemoglobin and renal activity. Pathophysiology of ABE imbalances.

PRACTICAL WORK

- Investigation of protidic metabolism.
  - Total protein assay methods, physical fraction separation methods, electrophoresis techniques; types of reactive dysproteinemias (acute inflammation, chronic inflammation, enteral and renal protein losses, gamapatias, etc.); serum colloid lability tests.
  - Qualitative immunoelectrophoresis and discussion of protein fractions (prealbumin, alpha-antitrypsin, acid alpha-glycoprotein, alpha2macroglobulin, ceruloplasmin, haptoglobin, hemopepsin, transferrin, C_3, IgG, IgM, IgA, IgD, IgE). Value of immunoelectrophoresis in the diagnosis of gammopathies; quantitative immunoelectrophoresis (Alfonso Laurell); Macini radial immunodiffusion, its applications, bulletins.
- Enzyme diagnosis. Enzyme classification, objectives in enzyme diagnosis, TGO, TGP, assay methods, normal and pathological values (hepatopathies, myocardial infarction, myopathies), alkaline and acid phosphatases, CPK, LDH, amylases, buletins.
- Investigation of carbohydrate metabolism. Diabetes mellitus staging and diagnostic methods (principles); blood glucose assay methods (reducing, colorimetric, enzymatic-critical discussion of them); glucose tolerance test (staging conditions, normal and pathological values, indications, contraindications) glucose tolerance test and glucocorticoids (Fajane-Jhon), to9lbutamide test (indications and contraindications) glucose and insulin test (Hinsworth); bulletins.
- Investigation of lipid metabolism. Chemical methods of separation and assay of lipid fractions (total lipids, total and esterified cholesterol, triglycerides, phospholipids, fatty acids) and critical discussion of them; physical methods of separation of lipid fractions (electrophoresis and ultracentrifugation), "screen test£, heparin test, diagnosis of hyperlipemias (I, IIa, IIb, III, IV, V), bulletins.
- Investigation of hydroelectrolytic metabolism. generalities about the body's fluid compartments; principles of paraclinical methods for detecting fluid compartments; diffusion spaces of sodium rhodanate and Evans albumin; serum ionogram; plasma hyper/hypoosmolarity syndromes.

- Investigation of acid-base balance.
  - Notions about buffer systems (bicarbonates, phosphates, haemoglobin, etc.); renal and respiratory regulation of acid-base homeostasis; classical method of investigating EAB (pH, H^+ CO_2, HCO3) and its limits; bulletins.
  - Astrup method-discussion of the Higaard0Anderson ionogram, notions of standard bicarbonate, actual bicarbonate, excess bases, total bases CO_2 their practical importance, bulletins.
- Investigating haemostasis.
  - Primary haemostasis and secondary haemostasis-general. Primary haemostasis invasion, 9Rumpell-leede garo test), platelet count and microscopic appearance Zalzman platelet adhesion test (in vitro), ADP- and ristocetin-induced platelet aggregation, bleeding type, clot retention; bulletins.
  - Secondary haemostasis investigation; global coagulability tests (clotting time, Howell, heparin tolerance time), prothrombin consumption time, correction tests, Quic time and differentiation tests, thrombin time, fibrinogen dosing; bulletin. Fibrinolysis investigation (total blood clot lysis time, transfer clot lysis time, reptilase time); bulletins.
- Normal electrocardiogram. Notions of leads (bipolar, unipolar) electrogenesis and normal characters of P wave, pQ segment, QRS complex, QT-T terminal phase, procedures for determining axes (QRS, P, T, T); tracings. Hypertrophies. Left and right atrial overloads (electrophysiological and diagnostic EKG), left and right ventricular hypertrophy (electrophysiological, diagnostic EKG - amplitude criteria, duration, axial changes, terminal phase changes, tracings. Intraventricular conduction disorders: right and left bundle branch blocks (electrophysiology, EKG diagnosis, direct and indirect signs. Diagnosis of left hemiblocks (HBSA and HBSP). Bilateral bifascicular and trifascicular blocks. Tracing. Atrioventricular conduction disorders, atrioventricular blocks grade I, II (MobitzI, II).Traces. Ischaemic heart disease: ischaemia, lesion, necrosis (electrophysiology, EKG diagnosis, "electrical window" theory and vector theory. Electrocardiographic staging of myocardial infarction. Topographic diagnosis of myocardial infarction (lateral anterior, posterior and septal group. Tracing. Ventricular pre-excitation syndromes: electrogenesis (generalities), WPW syndromes type A, B, and C (electrophysiology and EKG diagnosis), Mahain fiber pre-excitation syndromes - IGL syndrome. Traces. EKG diagnosis of arrhythmias: extrasystolic, supraventricular arrhythmia (electrogenesis and EKG diagnosis). Atrial fibrillation and atrial flutter (electrogenesis and EKG diagnosis). Traces. Differential diagnosis in EKG: QRS axial changes, changes in Dș ratio, changes in type parameters (TADI in V_1, V_2 and V5 ,V6 of the terminal phase (ST-T, q-wave, QS; tracings
- Exploration of ventilation: by pyrometry methods with discussion of tidal volume, VIR, VER, current and theoretical vital capacity and causes of its disturbance, FEV1, Tiffeneau index, resting ventilatory flow, maximum ventilatory flow, total lung capacity, functional residual capacity, residual volume, diagnosis of elastic retraction; determination of airway resistance VEmax50, exploration of alvelo-capillary diffusion; TAIHR and TI bulletins.
- Renal exploration.
  - Urine summary examination - changes in appearance, colour, density, specific gravity, pH, glycosuria (qualitative and quantitative methods), proteinuria (qualitative and quantitative

methods) and the importance of immunoelectrophoretic study of urinary proteins: biluribine, haematuria, leucocyturia; bulletins.

- Urinary volume and its changes; clearance techniques (definition, standardization conditions and clearance of urea, endogenous creatinine, inulin, sodium thiosulphate, PAH); Tmglucose; importance of these techniques in the diagnosis of nephropathies and stages of chronic renal failure. Bulletins.

- Liver exploration: Hepatocytosis syndrome - TGO, TGI, LDK (isoenzyme 5 and total), OCT, STH, serum serum, vitamin B12, hepatoprotein syndrome - plasma albumin and globulins (electrophoretic study), coagulation factor and baseline, Koller test, pseudocholinesterase, total and esterified cholesterol, triglycerides, phospholipids, total lipids, BSP retention test, BSP fractional clearence; bilio-excretory syndrome, alkaline phosphatase, 5-nucleotidase, leucine aminopeptidase, gamma-glutaminranspeptidase; mesenchymal hypo-reactivity syndrome. Bulletins,
- Exploring gastric chemistry. Notions of the physiology of chlorhydro-peptic secretion; basal acid flow and maximal flow in gastric ulcer, duodenal, gastritis, gastric cancer, Zollinger-Ellison syndrome. Bulletins.
- Erythrocyte series exploration. I. Generalities of erythropoiesis (medullary compartments); medulogram, reticulocyte and erythrocyte counts; erythrocyte indices (FEV, EMH, CHEM). Bulletins. Sideremia, latent and total iron binding capacity; direct and indirect Coombs test, alkaline resistant haemoglobin test, haemoglobin electrophoresis; bulletins. Leukocyte series investigation Leukocytosis (general), reactive leukocytosis; paraclinical diagnosis of leukemias, bulletins.

IMMUNOLOGY

ANALYTICAL SYLLABUS OF THE FUNDAMENTAL IMMUNOLOGY COURSE

1 semester (56 course hours)

COURSES

- Antifreeze
  - Classical definition of Ag; current definition of Ag; immunogenicity (clonal selection, activation of selected lcones, clonal expansion), specificity; complete Ag - immunogenic, incomplete Ag - hapten; linear (sequential) and conformational antigenic determinants - structure and functions; classification and functions of antigenic determinants; thymine-independent and thymine-dependent Ag.
- Antigen-presenting cells
  - General functions of APCs; classification of APCs; macrophages; dentritic cells (Langhrhans, interstitial, interdigitating, follicular, blood, veiled) and their circuit in the body; B lymphocytes; occasional APCs. MHC I and II molecules (structure, distribution, functions, genetic code; mechanisms of selective presentation of GA by MHC molecules.
- Lymphocyte populations and their surface markers
  - Introduction (B, I and LGL lymphocytes); T lymphocytes; antigen recognition characters, surface receptor classification, TCR - structure, distribution, function; CD3 - structure, distribution, function, genetic code; CD4 - distribution, structure, function; CBD - distribution, structure, function; associative antigenic recognition; receptors with accessory role in T lymphocyte metabolic activation; CD28 and CD45; intracellular adhesion receptors; Cd2/LFA3 (CD58) and FLFA1 (CD11a/CD18) / ICAM 1 and 2 and their functions; classification; phonotypic classification of T lymphocytes.
- Continuation
  - Mechanisms of T lymphocyte activation; general characters, CD4/CD8 - PTK (p56) pathway, TCR - CD3/PLC pathway - phosphatidyl inotide cascade, hypercalcification characters. B lymphocytes - general characteristics, surface receptors, antigen recognition characteristics, mechanisms of metabolic activation, NK cells - general characteristics, surface receptors, antigen recognition "direction" and indirection; functions. organization of immune system; spleen - structure, immunological functions, dynamics of the RIU in the spleen; lymph nodes - structure, immunological functions, dynamics of the RIU in lymph nodes.
- Humoral immune response (RIU)
  - Introduction, models of intracellular cooperation (classical, current), co-cognitive cooperation Ag 0 independence and Ag-dependence, noncognitive cooperation - role of IL1, hepler T lymphocyte subclasses (THp, THO, TH1, TH2, THm, IL2, IL4, IL5, IL6.
- Immunoglobulins and types of IUGs
  - RIU re-control by T supersore lymphocytes; Ag - specific, Ag - non-specific; Id - specific (T supersore cascade - TSi, TSt, TSe, and TSF1, TSF2, TSF3).

- Definition and basic structure of Ig, IgG (concentration, lifetime, distribution, H chains, L chains, IgG subisotypes, Fab-terminal structure, CDR1, CDR2, CDR3, Fc-terminal functions, CD64, CD32, Cd16 receptors, functional features of IgG subisotypes); IgM - concentration, lifetime, structure, functions; IgA - serum and IgA - secretory (synthesis and secretory mechanisms).

- Continuation + Complement system
  - Types of IUGR - primary IUGR and secondary IUGR; differential characters and immunological mechanisms involved (IL2, IL4, THp, TH2, THm). Definition and general functions of the complement system (effector system function, function of immunologically non-specific recognition of nonself structures); general characteristics (cascade principle, zymogens, large and small fragments, enzyme complexes); organisation of the complement cascade; factors in the classical pathway; C1, C2, C3, C4, C5, C6, C7, C8, C9; steps of the classical complement pathway; C3 - convertase generation; C5 - convertase generation, MAC generation.

- Continuation + The cellular immune response
  - Factors in the complement alternate pathway; common, specific (b, P, D, H, I); basal level of alternate pathway functionality and amplification loop; anticomplement protection mechanisms (CD59, HRF/C8bp). General functions of RIC and cells involved (TC, NK, K); cytotoxic T lymphocytes; phenotypic characteristics; TC lymphocyte classes, recognition and destruction function of antigenically acquired syngeneic cells, recognition and destruction function of allogeneic cells and cellular cooperations involved; NK cells; K cells; mechanisms of cytotoxicity - membrane injury (perforin and organisms) and nuclear injury (endonuclease and its inducers / apoptosis or programmed cell death).

- Type I hypersensitivity
  - Introduction - normality criteria of RIC / definition of hypersensitivity reactions; classification of hypersensitivity reactions; definition of HSI - notion of atopic allergy; principle scheme of HSI development; IgE - structure, concentration, lifespan, hyper IgE, functional peculiarities of IgE, FC receptorsεIR and CFεRII (distribution, structure, functions, uptake, presentation and clearance of Ag by IgE (cooperation and participating cell classes); regulation of IgE synthesis (APC), B lymphocytes - CD23+, TH2εTS and TH1); immunopathological mechanisms of hyper-IgE.

- Diagnosis of type I hypersensitivity
  - Introduction, skin tests (principle, advantages and disadvantages), basophil degranulation test (principle, advantages and disadvantages), IgE assay methods, PRIST, ELISA and RAST methods (principle; diagnostic value); mechanisms of mast cell and basophil activation; performance mediators: histamine, ECFA, NCFA, proteases and hydrolases; neoformed mediators: PAF, cyclooxygenated derivatives and lipoxygenated derivatives of arachidonic acid; immunopathology of bronchial asthma (bronchospastic mediators, chemotactic mediators, bronchial asthma as acute/chronic inflammatory disease).

- Type I hypersensitivity
  - Definition of HSII, principle scheme of HSII deployment, mechanisms of cytotoxic CA generation (alloimmunization and autoimmunization); post-transfusion alloimmunization: Ag in ABO blood system (genetic code, structure, tissue distribution), AC or agglutinins in ABO blood system, scheme of tolerability or compatibility in ABO system, notion of

"dangerous" donor, types of anti-A and abti-B AC (natural and "immune" AC), consequences of posttransfusion cytotoxic reaction; alloimmunisation in pregnancy (in the Rh system); structure and genetic code of Rh type Ag, mechanisms and consequences of Rh alloimmunisation in pregnancy (fetal erythroblastosis); autoimmunisation: autoimmune hemolytic anemias - Ag, AC direct and indirect Coombs tests.

- Type III hypersensitivity
  - HSIII definition, IC genesis in normal and their quantitative and qualitative characteristics, CIC genesis and their quantitative and qualitative characteristics, mechanisms of CIC pathogenesis: role of local hemodynamic factors, role of Ag affinity for tissues, role of site of CA production, role of CR1 expression; Arthus phenomenon: definition, immunopathological mechanisms of lesions, correspondences in human pathology of the Arthyus phenomenon (extrinsic "allergic" alveolitis); acute serum sickness: definition, experimental serum sickness, immunopathology of GNAD; chronic serum sickness.
- Type IV hypersensitivity
  - Definition of HISV, immunopathological basis of HSIV (naive and memory T lymphocytes, trafficking and lymphocyte homing), principle scheme of HISV development, classification of HSIV, immunopathology of Jones-Mote type HS, contact HS, classical and granulomatous methylopenia.
- Immunological tolerance
  - Definition of immunological tolerance, comments - advantages; conditions of induction of immunological tolerance (nature of Ag, dose of Ag, persistence of Ag, specificity of determinations; general basis of immune tolerance; mechanisms of induction of B lymphocyte tolerance (general characteristics, clonal destruction, clonal depletion, functional elimination): mechanisms of induction of T lymphocyte immunological tolerance (general characteristics, embryofertal period, adult period); importance of immunological tolerance.
- Autoimmune diseases
  - Definition, classification according to origin of AI process (primitive, secondary), classification according to pathogenesis and nature of auto - Ac (organ-specific / diffuse AI diseases), limits of classifications; organ-specific AI diseases: Hashimoto's thyroid AI, Basedow's disease, insulin-dependent diabetes mellitus, acute polyarticular rheumatism, Biermer's anaemia; diffuse AI diseases: disseminated lupus rheumatism, rheumatoid polyarthritis; mechanisms of immune tolerance (IT) breakdown - generalities, mechanisms of T lymphocyte-mediated IT breakdown, mechanisms of B lymphocyte-mediated IT breakdown.
- Primitive immunological deficits
  - Definition, calcification, predominantly humoral immunological deficits - B lymphocyte maturation process and its pathology, agamoglobulinemia X-linked, common variable hypogammaglobulinaemia, selective or dissociated hypogammaglobulinaemia predominantly cellular immunological deficits - di George's syndrome, purinnucleoside phosphorylase deficiency; mixed or combined immunological deficits - reticular dysgenesis, bare lymphocyte syndrome, severe combined immunological deficits.

PATHOLOGICAL ANATOMY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

2 semesters (56 hours courses, 56 hours practical work)

COURSES

- Introduction to pathological anatomy (subject of study of pathological anatomy).
  - Study methods. Morpho-functional concepts of lesions and diseases. Classification of pathological processes.
  - Circulatory disorders. Active hyperemia; blood stasis; ischaemia and anoxia; thrombosis (causes, types of thrombi, consequences); disseminated clotting syndrome; embolism (causes, forms, course); infarcts; white and red; haemorrhages; pathology of lymphatic circulation, lymphostasis, lymphorrhagia; pathological anatomy of irreversible shock.
- Dystrophic processes.
  - General notions on dystrophic processes of cells, fundamental substances and fibrillar systems. Fundamental cellular alterations. Reversible and irreversible damage.
  - Protein dystrophies: hydroprotein dystrophies, primary and secondary amyloidosis, hyalinosis, fibrin dystrophy. Dystrophies due to metabolic disorders of nucleoproteins (uric acid, urates). Scleroprotein dystrophies.
  - Pigmentary dystrophies: endogenous pigments (haemoglobin pigments; localised and generalised haemosiderosis, haemochromatosis, jaundice: mechanical toxiinfectious, haemolytic; newborn jaundice, congenital jaundice, profiria) and non-haemoglobin pigments: melanin and lipofuscin; exogenous pigments: anthracosis, siderosis, etc.
  - Fatty dystrophy: simple and degenerative steatoses; dyslipoidoses.
  - Carbohydrate dystrophies: acquired and inherited.
  - Mucopolysaccharide dystrophies.
  - Mineral dystrophies: circumscribed and metastatic calcinosis; rickets; osteomalacia; osteoporosis; lithiasis.
  - Atrophy and hypertrophy (physiological and pathological).
  - Necrobiosis and necrosis: coagulation and lichenification necrosis, septic and aseptic gangrene.
- Inflammation
  - Generalities about the inflammatory process. Anatomical and clinical classification of inflammation. Varieties of non-specific inflammation. Predominantly exudative inflammations (catarrhal, serous, serofibrinous, pseodomembranous, suppurative purulent, haemorrhagic).
  - Predominantly proliferative inflammation: diffuse and circumscribed (granuloma including foreign body granuloma and lipogranuloma, granulation tissue). Predominantly parenchymal inflammations. Predominantly necrotic inflammations. Healing processes in inflammation. Characteristics of inflammation according to aetiology and pathogenesis. Characters of acute, subacute and chronic inflammation. Changes in inflammatory lesions under treatment with antibiotics and other current therapies. Specific inflammation (tuberculosis): macroscopic and microscopic elementary lesions, stage forms, primary complex, lymphohaematogenous dissemination, secondary tuberculosis; changes in tubercular lesions under current treatments; Syphilis: macro and microscopic elementary lesions, stages of acquired syphilis (primary, secondary and tertiary); early and late congenital syphilis. Mycotic and parasitic inflammations. Generalities on morphopathology of inflammatory processes with immune mechanisms and in organ transplantation.
- Tumours

- General. Characteristics of the neoplastic cell. Etiopathogenesis and biology of tumour processes. Classification of tumours. Morpho-pathological features of benign and malignant tumours. Benign and malignant epithelial tumours. Benign and malignant tumours. Dysembryoplastic tumours. Histopathological staging and grading. General concepts of anatomopathological methods of investigation in the diagnosis of tumours.

- Regeneration and organisation processes.
  - Malformations
  - Healing processes. Causal and formal genesis of malformations (exo and endogenous teratogenic factors). Varieties and malformations.
- Respiratory diseases.
  - Upper respiratory pathology. Rhinopharyngitis and adenoiditis. Laryngitis and tracheitis. Bronchial and pulmonary pathology. Bronchial and pulmonary malformations. Acute and chronic bronchitis; bronchiectasis and bronchial asthma. Atelectasis, acute and chronic emphysema. Pneumonia, frank lung disease. Bronchopneumopathies. Interstitial pneumonias. Pulmonary suppurations, including pulmonary gangrene. pulmonary tuberculosis Pulmonary fibrosis, diffuse interstitial. Pneumoconiosis. Bronchopulmonary tumours. Pathology of the pleura: peluritis and pleuritis, pleural tumours.
- Diseases of the cardiovascular system
  - Cardiovascular malformations. Cardiac dilatations and hypertrophies. Ischemic heart disease.
  - Valvular heart disease. Endocarditis (aseptic and septic). Myocarditis. Pericarditis and pulmonary heart disease. Vascular lesions: degenerative arteriopathies, non-specific and specific arteritis, aneurysms, phlebectasis, thrombophlebitis, phlebothrombosis.
- Diseases of the digestive system, its organs and the peritoneum.
  - Oral-maxillofacial pathology. Stomatitis, angina and inflammation and tumours of the salivary glands. Pathology of the oesophagus. Caustic oesophageal malformations, strictures, tumours. Pathology of the stomach. Malformations. Acute and chronic gastritis. Gastroduodenal ulcer. Gastric tumours. Pathology of the small intestine and colon. Malformations of the small intestine and colon. Acute and chronic enteritis and enterocolitis. Ulcerohaemorrhagic enterocolitis, terminal ileitis. Acute and chronic appendicitis. Intestinal tuberculosis, intestinal lesions of typhoid fever, amoebic/ bacillary and rectilinous dysentery. Ileus. Intestinal tumours. Pathology of the liver and bile ducts. Acute and subacute necrosis. Acute and chronic hepatitis. Liver cirrhosis. Bile duct malformations. Biliary lithiasis. Angiocolitis. Cholangitis, cholecystitis. Liver and bile duct tumours. Pathology of the pancreas. Mucoviscidosis, acute and chronic pancreatitis, pathology of the endocrine pancreas, tumours of the pancreas. Pathology of the peritoneum. Acute and chronic peritonitis, tumours of the peritoneum.
- Pathology of the urinary tract.
  - Kidney and urinary tract malformations. Glomerular, tubular and interstitial nephropathies. Renal tuberculosis. Nefrangiosclerosis. Hydro- and pyonephrosis. Renal lithiasis. Renal tumours. Inflammations and tumours of the bladder and urinary tract.
- Pathology of the male and female genitalia.
  - Malformations of the male genital tract. Acute and chronic orchididymitis. Prostate and prostatic hypertrophy. Tumours of the testis and prostate. Malformations of the female genital tract. Cervicitis. Cervical dysplasia. Endometritis. Benign and malignant tumours of the uterine body and cervix.
  - Pregnancy pathology: miscarriages, ectopic pregnancy, hydatidiform mole, choriocarcinoma. Salpingo-ovaritis and pelvi-peritonitis, ovarian cysts and tumours. Pathology of the mammary gland. Mastitis. Sclerosing mastitis. Sclerosing adenosis. Benign and malignant tumours of the mammary gland.
- Pathology of the hemato-leukocyte and lymphopoietic apparatus.
  - Haematopoiesis and leukoptosis pathology. Morphology of megaloblastic anemias and neonatal erythroblastosis. Acute and chronic leukemia (granulocytic, monocytic,

lymphocytic). Panmyelopathies. Pathology of the lymphoid system. Inflammatory and degenerative lymphadenopathies. Hodgkin's and neo-Hodgkin's malignant lymphomas. Spleen pathology: inflammatory, degenerative, tumoral.

- Endocrine system pathology
  - Thyroid: acute and chronic thyroiditis, goiters, Basedow's disease, thyroid tumours. Parathyroids: adenomas and fibrocystic osteodiphthrophy.
  - Hypophysis: adenomas of the anterior hypophysis.
  - Adrenal: tuberculosis, Addison's disease, adrenal tumors.
- Pathology of the nervous system.
  - Malformations. Traumatic brain injury. Cerebral haemorrhage and embolism. Meningitis and encephalitis. Tumours of the meninges and central and peripheral nervous system.

PRACTICAL WORK

- Circulatory disorders
  - Blood stasis in the kidneys
  - Blood stasis in the liver
  - Chronic pulmonary stasis
  - Trombus
  - Kidney infarction
  - Myocardial infarction
  - Pulmonary infarction
- Dystrophic lesions
  - Hydro-protidic dystrophy
  - Hisaline dystrophy in the ovary
  - Amyloid dystrophy
  - Gaucher disease
  - Neimann Pick Disease
  - Bile stasis in the liver
  - Liver stasis, ice sections, special staining
- Nonspecific inflammation
  - Purulent meningitis
  - Acute phlegmonous appendicitis
  - Liver abscesses
  - Epidemic parotitis (complicated, suppurative purulent)
  - Ulcerative-necrotizing enteritis
  - Fibrinous pleurisy
  - Grain weave
- Specific inflammations
  - Rheumatic granuloma (myocarditis)
  - Lymph node tuberculosis
  - Pulmonary tuberculosis
  - Aortitis lutea (elementary lesions in syphilis)
  - Disease with cytomegalic inclusions
  - Myocytic pyelonephritis
  - Actinomycotic granuloma (pulmonary)
- Benign tumours
  - Cutaneous papilloma Glandular polyp (ulcerated, infected)
  - Adenofibroma mammary
  - Cutaneous haemangioma
  - Mixed parotid tumour (pleomorphic adenoma)
  - Ovarian Taratom

  - Uterine leiomyofibroma
- Malignant tumours
  - Basal cell carcinoma
  - Squamous cell carcinoma
  - Schir mamar
  - Adenocarcinoma colon
  - Adenocarcinoma lymphangial metastasis
  - Sarcom. Osteochondrosarcom
- Breathing apparatus
  - Frank lobar pneumonia
  - Bronchopneumonia
  - Interstitial penumonia
  - Pulmonary tuberculosis
  - Pulmonary emphysema
  - Silicosis
  - Lung carcinoma
- Cardiovascular apparatus
  - Valvular endocarditis
  - Rheumatic myocarditis
  - Friedler myocarditis
  - Myocardial infarction
  - Pericarditis fobrinoides
  - Atheromatosis
  - Syphilitic aortitis
- Digestive system
  - Gastric ulcer
  - Mucosecretory gastric carcinoma
  - Mycotic gastritis
  - Ulcerative-necrotic enteritis
  - Crohn's Disease
  - Acute appendicitis
  - Adenocarcinoma of the colon (rectal)
- Digestive system
  - Chronic aggressive (active) hepatitis
  - Cirrhosis of the liver
  - Hepatocellular carcinoma
  - Hepatic hemochromatosis
  - Cholecystitis
  - Pancreatic cytosteanosis
  - Pancreatic mucoviscidosis
- Urinary system
  - Proliferative glomerulonephritis
  - Amyloid glomerulonephrosis (special staining)
  - Acute pyelonephritis (suppurative)
  - Chronic pyelonephritis
  - Renal sclerosis
  - Tumora Grawitz
- Female genital apparatus
  - Gladulocytic endometrial hyperplasia
  - Tubal pregnancy
  - Hydatidiform mole

  - Adenomyosis
  - Cervical carcinoma
  - Papliferous adenoma ovarian cyst
  - Mastosis reclusive.
- Male genital tract; malignant lymphomas
  - Prostate adenoma
  - Testicular seminoma
  - Intestinal lymphosarcoma
  - Histiocytic lymphoma
  - Hodgkin's lymphoma
  - Leukaemic infiltrates in the lymph node
- Thyroid and nervous system pathology
  - Colloid goo
  - Basedow's Gue
  - Chronic lymphomatous thyroiditis (Hashimoto's)
  - Polio
  - Viral encephalitis
  - Neurinom
- Breathing Apparatus
  - Pulmonary emphysema
  - Diffuse interstitial lung disease
  - Bronchopulmonary cancer
- Cardiovascular apparatus
  - Cardiomyopathies
  - Ischaemic heart disease
  - Vasculitis in collagen diseases
- Digestive system
  - Chronic gastritis - role of H. Pylori
  - Gastric cancer
  - Colon cancer
- Nephrology
  - Glomerular nephropathies
  - Tubular nephropathies
  - Vascular nephropathies
- Gynaecology
  - Correlations between dysplaias and viral infections
  - Cervical neoplasm
  - Ovarian tumours

HYGIENE

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

1 semester (28 hours of courses, 28 hours of practical work)

COURSES

- Introduction: General objectives. Definition and purpose of Hygiene; definition of health and its determinants: sanogenic and pathogenic factors. Indicators of health status and research methods in hygiene. Health indicators and research methods in hygiene. Ecology and ecological systems; field of human ecology.
- Air hygiene
  - Air as an environmental factor. Chemical composition of air and influence on health. Variations in the partial pressure of oxygen, nitrogen and carbon dioxide and their effects on the body; preventive and control measures.
  - Air pollution; sources of pollution and main air pollutants: irritant, fibrous, toxic, asphyxiant, carcinogenic, allergenic pollutants. Action of air pollutants on the human body and ecosystems. Air self-purification and its importance for health. Measures to prevent and combat air pollution: medical measures, administrative and organisational measures to protect the environment.
  - Mycobiological contamination of air, objects and surfaces: sources and mechanisms of contamination. Viability and stability of germs in the atmosphere and the main diseases produced (bacterial, viral, fungal). Prevention and control measures; air disinfection.
  - Climate: climatic zones, types of climate and their action on the organism; acclimatisation. Meteorosensitivity, meteorophysiology and meteoropathology.
- Water hygiene
  - The importance of water in the body and physiological water requirements. Individual and collective water needs (urban, industrial, livestock). Water sources and their qualities.
  - Water pollution from organised and unorganised sources; accidental pollution. Main biological, chemical and physical pollutants. Self-purification of water and its sanitary importance.
  - Microbial, viral and parasitic waterborne diseases and their causative factors; types of manifestation; prophylaxis.
  - Diseases caused by excess or deficiency of certain mineral elements (iodine and endemic goitre, fluoride, dental caries and flourosis, trace minerals and cardiovascular diseases).
  - Toxic substances in water: nitrites, metals, pesticides, detergents, cions, polycyclic aromatic hydrocarbons, etc. Sources and mechanisms of pollution. Forms of poisoning; preventive measures. Effects of chemical water pollution on ecosystems.
  - Sanitary conditions of water potability: organoleptic conditions, physical conditions (temperature, turbidity, colour, radioactivity, chemical conditions (toxic substances, undesirable substances, indicator substances), microbiological conditions (bacteria, viruses, bacteriophages), biological conditions (plankton, benton, tripton, seston).
  - Sanitary conditions of water supply: abstraction, treatment (sedimentation, filtration, disinfection, etc.) storage, distribution and protection.

- Sanitary conditions of local water supply (wells, springs): location, construction, use, protection, sanitation.

- Soil hygiene
  - Soil as an environmental factor. Structure, composition and classification of soils. Biological and chemical processes in soils and their health significance.
  - Chemical soil pollution: sources and ways of pollution with pesticides, fertilizers, toxic metals and metalloids, redionuclides. Soil self-purification.
  - Soil-transmitted microbial, viral and parasitic diseases; preventive measures.
  - Solid and liquid residues: origin, calcification, sanitary, ecological and economic importance. Collection, removal and treatment of solid and liquid residues. Removal of faecal residues in sewerage.

- Radiation hygiene
  - Ionizing radiation: classification, mechanisms of action, dose-effect relationship. Action of ionising radiation on the body: somatic effects, gebetic effects. Natural radioactive background; radioactive contamination of the environment and the body; medical, occupational and accidental exposure; means of prevention and control.
  - Non-ionising radiation: classification, properties. Action on the body of heat, light, ultraviolet, laser and microwave radiation; health regulations, prevention and control measures.

- Hygiene of the home and public institutions.
  - Household hygiene and its sanitary importance. Pathologies caused by inadequate housing: infectious diseases, rickets, rheumatism, cardiovascular diseases, mental illnesses, housing accidents, etc. The conditions of a healthy home: location, interior planning (rooms, height, surface area, storage space); equipment of the home.
  - Thermal environment and its determinants. The action of the hot environment on the body and the effects of extreme conditions (heat shock, heat collapse, hydro-electrolyte imbalance). The action of cold environments and the effects of extreme conditions (frostbite, frostbite, paralysis, reduced immune capacity, cold-related diseases). Prevention and control measures.
  - Heating, ventilation, hygienic lighting, damp (damp) control, hygienic maintenance of the home
  - Hygiene of public institutions (hotels, showrooms, campsites, temporary communities, etc.). Sanitary conditions of the modern hospital: location, construction, functional circuits (patients, visitors, food, linen, waste), sanitary facilities. Prevention and control of hospital indoor infections.

- Local hygiene
  - Systematisation and zoning of settlements: residential area, green area, industrial area, preurban area, recreation and leisure area, etc. Building facilities.
  - Noise pollution and its specific effects on the auditory analyzer and non-specific effects on various organs and systems (central nervous system, cardiovascular, digestive). Prevention and control measures.

- Transport hygiene
  - Sanitary conditions of rail, road, sea and air transport. Hygiene of railways, docks and airports. Prevention of traffic accidents.
- Nutritional requirements of a healthy human being
  - The importance of food for development, work capacity and health of the population.
  - Human energy levels according to age, sex, activity, environmental conditions. Effects of caloric under- and overfeeding.
  - Protein, fat and carbohydrate requirements for different categories of consumers, in relation to physiological state and demographic and environmental conditions. Effects of inadequate (insufficient or excessive) intake. Dietary sources of protein, fat and carbohydrates.
  - Mineral requirements. The role in nutrition of the mineral macroelements (calcium, phosphorus, magnesium, sodium, potassium, chlorine, sulphur) and the mineral trace elements (iron, copper, zinc, iodine, fluorine, cobalt, manganese, molybdenum, chromium, selenium). The requirements for different categories of consumers in relation to physiological state and working and environmental conditions. Effects of inadequate (insufficient or excessive) intake. Food sources for each mineral element.
  - Vitamin requirements. The role in nutrition of fat-soluble (A, D, E, K) and water-soluble vitamins (B_1, B_2, B_6, PP, B12, folic acid, pantothenic acid, bitine, vitamin C, vitamin P). The requirements for different categories of consumers, in relation to the physiological state, environmental conditions and diet. Effects of inadequate or excessive intake. Main food sources for each vitamin.
- Nutritional value and food hygiene
  - For each group of foods, the following are dealt with: how they are obtained and the forms in which they are eaten; their composition, nutritional value and the factors that condition them; recommended quantities for different categories of the population (children, adolescents, working adults, women during maternity leave, the elderly); microbial, viral and parasitic diseases that can be transmitted by the foods in question; chemical contamination (with pollutants and additives) and the effects on consumers; hygiene measures in the production, transport, storage and processing of products.
  - 1. Milk and milk products
  - 2. Meat, fish and meat and fish preparations.
  - 3. Eggs and egg preparations.
  - 4. Vegetables, fruit and vegetable and fruit preparations
  - 5. Derivatives of cereals and pulses.
  - 6. Sugary products
  - 7. Dietary fats.
  - 8. Non-alcoholic and alcoholic beverages.
- Hygiene of food establishments
- Rules on hygiene and location, construction, use of premises, equipment and operation of food establishments (industrial, storage, retail and public consumption). Hygiene and health of persons working in the food sector. Knowledge of the existing regulations in our country in this field.

- Hygiene for children and young people.
  - General characteristics of the physical and neuropsychological development of children and young people. Laws of child and youth development. Endogenous factors influencing development; geographical environment, climate, seasons, nutrition, housing, chronic diseases, urban-rural environment, social-economic conditions, education and training.
  - Developmental characteristics of children aged 0-3 years. Hygiene and sanitary conditions of the nursery.
  - Developmental characteristics of 4-6 year olds. Hygiene and sanitary conditions of the kindergarten.
  - Developmental characteristics of school-age children. Hygiene and sanitary conditions of the school.
  - Hygiene of school work: factors influencing students' work capacity; fatigue, rest. Medical problems of school and vocational orientation.
  - Measures to prevent infectious diseases and chronic diseases in communities of children and young people.

PRACTICAL WORK

- Determination of asphyxiating air pollutants (CO) and effects on the body.
- Determination of irritant air pollutants and effects on the body.
- Determination of toxic air pollutants and effects on the body.
- Determination of the thermal environment, air vitiation and effects on the body.
- Determination of microbial and fungal contamination of air, objects and surfaces.
- Bacteriological analysis of water: mesophilic and coliform germs.
- Water disinfection: determination of active chlorine in chlorine substances, chlorine requirements for disinfection and residual chlorine in water.
- Chemical analysis of water potability: pollution indicators (organic substances, ammonia, nitrites). Determination of undesirable substances (hardness, calcium, magnesium, chlorides)
- Determination of toxic substances in water (nitrites, fluoride) and their effects on the body.
- Bacteriological and chemical soil analysis.
- Determination of ionising and non-ionising radiation and effects on the body.
- Laboratory examination of milk and milk products. Degradation mechanisms, unhealthiness. Organoleptic, physical (density), chemical (dry matter, lipids, acidity, pasteurisation control, reductase test) and bacteriological (total mesophilic germ count, coliform bacteria) examinations. Interpretation of results.
- Laboratory examination of pig fat, meat and egg preparations. Mechanisms of degradation, spoilage, unhealthiness. Organoleptic, physico-chemical examinations (ammonia, hydrogen sulphide, slightly hydrolysable nitrogen, pH), bacterioscopy. Interpretation of results.
- Laboratory examination of vegetables, fruits and cereal derivatives. Mechanisms of degradation, spoilage, unhealthiness. Organoleptic, physico-chemical examinations (vitamin C

in vegetables and fruit, hydrochloric acid insoluble ash in vegetables and fruit, porosity of bread, wet gluten in flour, identification of starch in flour). Interpretation of results.

- Laboratory examination of fats, sugar products and sterilised canned foods. Mechanisms of degradation, spoilage, unhealthiness. Organoleptic, physico-chemical examinations (free acidity of fats, Kreis reaction, iodine index of fats, synthetic sweeteners and dyes in sugar products, sealing and bacteriological examination of preserves). Interpretation of results.
- Laboratory examination of alcoholic and non-alcoholic beverages. Mechanisms of degradation, alteration, unhealthiness. Organoleptic, physico-chemical examinations (acidity, degrees, refractometry, alcohol concentration, preservatives, synthetic dyes) Interpretation of results.
- Methodology for researching hygiene conditions in a food or collective establishment.
- Knowledge of the food structure in a canteen by using food lists used to prepare menus. Calculating the average amount of food consumed by a person and its content in calories and nutrients (protein, fat, carbohydrates, minerals, vitamins). Interpreting the results.
- Methodology for creating correct menus for different population groups: children, adults, pregnant and breastfeeding women.
- Methodology of knowledge of the nutritional status of a community through somatic, clinical, biochemical and haematological examinations, special tests.
- Methods for assessing the physical and neuropsychological development of children aged 0-3 years. Control of hygiene conditions of the nursery.
- Methods for assessing the physical and neuropsychological development of preschool children. Control of hygiene conditions in the kindergarten.
- Methods for assessing the physical and neuropsychological development of school children. Control of hygiene conditions in schools.
- Assessment of the activity and rest regime of schoolchildren (methods for assessing school fatigue).
- Methods of work of the doctor in school and vocational guidance.

PARASITOLOGY

ANALYTICAL PROGRAMME OF COURSES AND PRACTICAL WORK

1 semester (14 hours courses, 14 hours practical work)

COURSES

- Parasites and the relationships established between parasite and human host: commensalism, symbiosis, parasitism, evolutionary transformations related to the parasitic way of life. Parasite pathways into the body, elimination pathways.
- Parasitic protozoa: morphology, physiology: movement, metabolism, life cycle.
- *Cavitation protozoa*:
  - *Entamoeba histolytica:* morphology, life cycle, pathogenic role; intestinal and extraintestinal amebiasis. Elements of parasitological diagnosis. Mode of transmission, prophylactic measures.
  - *Giardia duodenalis*: morphology, life cycle. Methods for detection of the parasite in stool and duodenal fluid. Modes of transmission and prevention of infection.
  - *Trichomonas vaginalis*: morphology, life cycle. Pathogenic role. Particularities of infection in women, girls and men. Parasitological diagnosis. Modes of transmission. Prophylaxis.
  - *Cryptosporidium parvum*: description, life cycle. Pathogenic role. Characteristics of infection in normal and immunosuppressed individuals. Methods for detection of oocysts in stool. Ways of preventing infection.
  - *Isospora belli*: description of morphology and life cycle. Pathogenic role in immunologically compromised organisms. Parasitological diagnosis. Mode of transmission of infection.
- *Tissue and blood protozoa*
  - *Naegleria fowleri*: description, pathways into the human body. Pathogenic role. Primary amebic acute meningoencephalitis. Methods for detection of the parasite in cerebrospinal fluid and nasal secretion. Sources of infection, mode of transmission. Preventive measures.
  - *Acanthamoeba culbertsoni, A. poliphaga, A. castelanii*: description, pathogenic role; encephalitis granulosum and keratitis. Parasitological diagnosis. Sources of infection, mode of transmission.
  - *Pneumocystis carinii*: description, life cycle. Pathogenic role: plasma cell interstitial pneumonia in immunologically depressed individuals. Sources of infection, modes of transmission, prophylactic measures.
  - *Toxoplasma gondii*: description of tachyzoites, tissue cysts and oocysts. Schizogonic and sporogonic cycle. Mechanisms of production of acquired and congenital toxoplasmosis. Characteristics of acquired infection in individuals with competent and depressed immune systems and congenital infection. Elements of parasitological and immunological diagnosis. Ways of preventing infection.
  - *Plasmodium vivax, Plasmodium falciparum, Plasmodium ovale*: description, primary and secondary exoerythrocytic schizogonic cycle, erythrocytic cycle and sporogonic cycle. Elements of parasitological diagnosis. Modes of malaria transmission: vector-borne, transfusion, transplacental and 'import'. Current situation of malaria in the world. New control strategies: vaccination and vector control by biological agents.
  - *Leishmania donovani*: description of the parasite, life cycle in vertebrate and invertebrate hosts. Pathogenic role: visceral leishmaniasis. Parasitological diagnosis-detection of parasite in splenic, bone and lymph node puncture material. In vitro cultures.

Immunodiagnosis. Spread of the disease throughout the world, mode of transmission. Prophylaxis.

- *Leishmania tropica*. Pathogenic role: cutaneous leishmaniasis. Aspects of lesions. Parasitological diagnosis. Spread, mode of transmission.
- *Leishmania braziliensis*. Pathogenic role: cutaneo-mucous leishmaniasis. Global spread, mode of transmission.
- *Trypanosoma brucei gambiese and rhodesiense*: description, life cycle in vertebrate and invertebrate hosts. Modes of parasite survival in the immune human host (antigenic variation). Parasitological diagnosis. Mode of transmission of infection. Prevention.
- *Trypanosoma cruzi*: the evolutionary cycle. Pathogenic role: Chagas disease. Parasitological diagnosis. Determinants of disease occurrence: existence of parasite reservoir, vector and low socio-economic status.
- *Liver trematodes*. *Fasciola hepatica*: description of the parasite, life cycle. Pathogenic role. Parasitological diagnosis. Mode of infection.
- *Lung trematodes*: *Paragonimus westermani*: morphology, life cycle, pathogenic role. Diagnosis. Epidemiology.
- *Trematode sanguine*: *Schistosoma haemtobium*, *S. japonicum*, *S. mansoni*: spread, description, life cycle. Transmission. Pathogenic role. Parasitological diagnosis. Prophylaxis.
- *Taenia saginata and Taenia solium*: description, life cycle. Pathogenic role. Parasitological diagnosis. Parasite reservoir in nature, mode of spread, prophylaxis.
- *Human cysticercosis:* modes of production, etiological agents: *Taenia solium*, *Taenia multiceps multiceps* and *Taenia multiceps serialis*. Pathogenic role: cerebral, ocular and cutaneous cysticercosis. Parasitological and immunological diagnosis.
- *Diphylobotrium latum*: description, life cycle, pathogenic role. Factors determining the spread of the parasite. Parasitological diagnosis. Measures to prevent infection.
- *Hymenolepsis nana*. Morphology of the adult parasite and eggs. Life cycle. Particular features of infection in immunosuppressed organisms. Parasitological diagnosis. Geographical spread, mode of transmission, prophylaxis.
- *Echinococcus granulosus*: description of the adult parasite, life cycle. Hydatid disease: description, mode of formation, evolution, complications. Immunological and parasitological diagnosis. Epidemiology: pastoral and sylvatic echinococcosis: sources of infection, mode of transmission, prophylaxis.
- *Echinococcus multilocularis*: description of alveolar hydatids. The parasite reservoir in nature. Modes of infection.

- *Intestinal nematodes:*
  - *Ascaris lumbricoides*: description of adult parasites and eggs. Evolutionary cycle in the human body. How to detect parasite eggs in faeces. Epidemiology.
  - *Trichuris trichiura*: Morphology of adult parasites, life cycle, location in the human body. Parasitological diagnosis. Mode of transmission of infection.
  - *Enterobius vermicularis*: Description, biological cycle, autoinfection phenomenon, pathogenic role. Methods for detection of eggs and adult parasites. Epidemiology of contagious parasitosis. Control of pinworm in children's communities.
  - *Strongyloides stercoralis.* Description of adult parasites and rhabditoid and strongyloid larvae. Life cycle: direct evolution, internal and external autoinfection, indirect evolution. Pathogenic role. Particular features of infection in immunologically deprived individuals. Epidemiology. Prophylaxis and control.

- *Ancylostoma duodenale and Necator americanus*: description, life cycle. Global spread, transmission, pathogenic role. Parasitological diagnosis. Cutaneous larva migrans syndrome produced by larvae of *Strongyloides*, *Ancylostoma braziliense* and *Ancylostoma caninum*.

- *Tissue-borne nematodes.*
  - *Trichinella spiralis*: description of the adult parasite and larvae. Life cycle, pathogenic role. Mode of infection. Parasitological and immunological diagnosis. Epidemiology. Prevention and control.
  - *Toxocara canis and Toxocara cati*: aetiological agents of "visceral larva migrans" syndrome. Mode of infection. Evolutionary cycle of parasites in the human body. Pathogenic mechanisms: visceral and ocular locations. Ways of detecting the presence of the parasite in the human body. Prevention of toxocariasis.
  - *Onchocerca volvulus*: description, life cycle. Pathogenic role. Mode of infection. Geographical spread.
  - *Wuchereria bancrofti*: description, spread, transmission. Pathogenic role. Diagnosis. Prophylactic measures.
  - *Loa loa*: morphology of adult parasites and larvae, life cycle. Mode of transmission. Prevention measures.
  - *Dracunculus medinensis*: description of parasites and life cycle. Geographical spread, transmission, measures to prevent infection.

- *Ectoparasites:*
  - *Sarcoptes scabiae*: description, biology. Pathogenic role. Mode of transmission of parasites.
  - *Pendiculus humanus capitis and Pendiculus humanus corporis*. Morphology, biology. Pathogenesis of pediculosis. Pediculus as vectors (*Ricketsia prowaseki*, *Ricketsia quintana* and *Borelia recurentis*).
  - *Phthirus inguinalis:* morphology, biology, clinical manifestations. Epidemiology.

PRACTICAL WORK

- Cavitary protozoa: *Entamoeba histolytica*, *Giardia duodenalis*, *Trichomonas vaginalis*, *Cryptosporidium parvum*, *Isospora belli*. Parasite morphology is demonstrated on permanent microscopic slides and slides. Native preparations in physiological solution and stained with lugol are made and examined microscopically. Ziehl Neelsen staining for oocyst detection.
- Tissue and blood protozoa: *Naegleria fowleri*, *Acanthamoeba culbertsoni*, trophozoites and chikonoses are shown on microscopic slides and slides.
- *Pneumocystis carinii*: presentation of the morphology of trophozoites and cysts on Giemsa and toluidine blue stained preparations.
- *Leishmania donovani* and *Trypanosoma brucei gambiese*: morphological appearance of parasites in vertebrate and invertebrate hosts is demonstrated on microscopic and slide preparations.
- *Toxoplasma gondii*: developmental stages in the definitive and intermediate host are shown on microscopic and slide preparations (light and electron microscopy).
- *Plasmodium vivax, malariae, falciparum, ovale*: slide presentation of the morphology of the different life cycle stages. Parasitological diagnosis by haematological examination: demonstration of blood smear and thick smear, fixation and staining by Giemsa method.
- Human cysticercosis caused by *T. solium* and *T. multiceps*: cysticercal morphology demonstrated on macroscopic and microscopic preparations. Cysticercal lesions in organs: macroscopic and microscopic preparations.

- *Diphylobotrium latum*: on macro- and microscopic preparations the morphology of the developmental stages in intermediate and definitive hosts is presented. Examination of microscopic preparations of *Diphylobotrium* eggs for diagnostic purposes.
- *Hymenolepis nana*: demonstration of morphology of evolutionary forms in macro- and microscopic preparations. Examination of direct and post-concentration preparations for evidence of parasite eggs.
- *Echinococcus granulosus* and *multilocularis*: presentation of the appearance and morphological structure of the larval form (hydatid) on macroscopic, microscopic (hydatid sand) and slide preparations.
- Intestinal nematode. *Ascaris lumbricoides*: presentation of developmental stages (adult, migratory larvae, eggs) on macro- and microscopic preparations. Coprological examination for eggs. Differential diagnostic elements between unfertilised, fertilised and embryonated eggs.
- *Trichuris trichiura*: morphology of developmental stages: macroscopic and microscopic preparations. Coprological examination for the detection of eggs.
- *Enterobius vermicularis*: morphology of adult forms and eggs (macro, microscopic and slide preparations). Parasitological diagnosis: taping and microscopic examination of the preparation for Enterobius eggs.
- *Strongyloides stercoralis*, *Ancylostoma duodenale*: morphology of the evolving forms (macro, microscopic and slide preparations). Parasitological examination by direct preparations, charcoal coproculture for the detection of rhabditoid larvae.
- Tissue nematodes. *Trichinella spiralis*: morphological appearance of larvae (microscopic and slide preparations).
- *Toxocara canis*: morphology of larvae and appearance of lesions caused by them (slides).
- Tissue and lymphatic filariasis: presentation of the developmental stages with special reference to larval forms (microfilariae).
- Ectoparasites. *Sarcoptes scabiae*: morphology (microscopic and slide preparations).
- *Pendiculus humanus capitis* and *corporis*: morphology of adults and eggs on fixed preparations and slides.

VIROLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

1 semester (28 hours course, 28 hours practical work)

COURSES

- Viral taxonomy; main families of medical interest; Viral replicative cycle; Pathogenesis of viral infection; Viral persistence; Prion infections.
- Immunity in viroids; cellular immune response; autoimmunity and tolerance; Interferon: mechanisms of action and biological effects. Viral vaccines.
- Picornaviruses: polioviruses and other enteroviruses; rhinoviruses; laboratory diagnosis; differences between attenuated and virulent strains of polioviruses.
- Arboviruses: Flavi-, Toga- and Bunyaviruses; Viral haemorrhagic fevers; Laboratory diagnostics; Monitoring emerging virus epidemics.
- Ortho and paramyxoviruses: influenza viruses; pandemic strains and epidemic strains. Laboratory diagnosis. Variability of influenza viruses; vaccines in influenza prophylaxis.
- Herpesviridae: HSV 1 and 2, VZ, EBV and CMV; Human herpesviruses 6, 7 and 8. Laboratory diagnosis. Specific antivirals for some herpesviruses.
- Hepatitis viruses: Hepatitis A, B, C, Delta, E; newly identified hepatitis viruses. Etiological agents. Haemovigilance concepts.
- Laboratory diagnosis of acute viral hepatitis. Chronic hepatitis B and C viruses. Markers for monitoring progression and treatment of chronic hepatitis. Viral liver carcinoma.
- Retroviridae: onco and lentiviruses. Human oncoviruses. Mechanism of gene transfer with retroviruses. Laboratory diagnosis.
- HIV/AIDS infection; Etiologic agent. Evolution and staging of HIV/AIDS infection in adults and paediatrics; Laboratory diagnosis.
- Antiretroviral. Reverse transcriptase inhibitors; viral protease inhibitors. Combination therapy. Mechanisms of antiretroviral resistance. Immunotherapy in HIV infection. Effect of antiretrovirals in other viroids.
- Viruses and cancer. Oncogenes and antioncogenes. Oncogenesis with DNA viruses. RNA virus oncogenesis. Vaccination possibilities in cancers of viral etiology.

PRACTICAL WORK

- Algorithm of operations involved in rapid virological diagnosis:
  - Stages of virus isolation and identification from patients,
  - Cultivation of viruses in embryonated chicken eggs: Anatomy of the embryonated chicken egg. Inoculation routes,
  - The laboratory animal in virological diagnosis. Cultivation of viruses in the laboratory animal. Main routes of inoculation. Genetically modified animal populations in virus diagnosis.
- Cell cultures: Classification of cell cultures. Virus isolation in cell cultures. Main types of cytopathic effect.
- Laboratory diagnosis of enteroviroids: infectivity titration by the plaque method; Serum neutralization reaction (SNR); Virusneutralization in the diagnosis of enteroviral infections; Checkerboard method.

- Laboratory diagnosis of respiratory viroids: haemagglutination reaction (HA). haemadsorption reaction. Haemagglutination reaction. Immunofluorescence diagnosis of respiratory virobiases.
- Laboratory diagnosis of viral hepatitis (I): diagnosis of hepatitis A, diagnosis of hepatitis B: HBsAg detection methods, HBV infectivity markers, diagnosis of hepatitis C, diagnosis of hepatitis D, diagnosis of hepatitis E. Enzyme-linked immunosorbent assay - ELISA
- Diagnosis of HIV/AIDS infection (I): serological techniques for triage and confirmation: ELISA, Western Blot (WB), Techniques for detection of virus and viral products: RIPA radioimmunoprecipitation technique. Gene amplification technique (PCR).

MEDICAL ETHICS. ELEMENTS OF ETHICS AND BIOETHICS

ANALYTICAL PROGRAMME OF COURSES AND PRACTICAL WORK

1 semester (14 hours of courses, 14 hours of practical work)

- THE NEED FOR MORALITY IN MEDICAL PRACTICE. MEDICAL ETHICS

Topics under discussion:

What is morality? What is medical ethics? The importance of medical ethics and the teaching of medical ethics. The duality of the doctor: humanity-competence. What does it mean to be competent? What does it mean to be a medical professional? Respect for patients' rights and professional responsibility. Professional independence

- ELEMENTS OF MEDICAL ETHICS

Topics under discussion:

Ethical dilemma. Medical ethics dilemma. Caile decision in ethical dilemma: theories of good. Elements of analytical ethics, normative ethics, descriptive (applied) ethics.

- DOCTOR-PATIENT RELATIONSHIP
  - Moral values of the doctor-patient relationship. Trust, loyalty, fidelity, honorability, respect, treating equally.
  - Legal values of the doctor-patient relationship. Patient rights: right to medical care, right to information, right to medical truth, right to privacy. Best interests of the patient. Patient autonomy.
  - Models of the doctor-patient relationship: paternalism vs. autonomy. Decision making for legally incompetent patients.
  - Mechanism of professional decision-making in medicine: types of reasoning, medical reasoning, risks in medical practice, quality of life, risk-benefit balance assessment. Treating vs. not treating. Patient medical documentation (patient medical record). Medical errors.
  - Communication. Information. Telling the truth in medicine. Informed consent.
  – Medical confidentiality.
- THE RELATIONSHIP OF THE PHYSICIAN TO SOCIETY: individual good vs. good of science and public good, dual loyalty, justice of the medical act and medical care, non-discrimination, conflict of interest, allocation of limited resources.
- THE DOCTOR'S RELATIONSHIP WITH COLLEAGUES. Professional and scientific collaboration. Professionalism in medicine. Collegiality, solidarity of the professional body. Possible situations of conflict and ways of resolution.
- MEDICAL DEONTOLOGY AND NORMATIVE ETHICS: the duty of the physician; the regulation of the exercise of duty in medicine and the morality of professional conduct. The Hippocratic oath and the continuity of moral norms in the practice of medicine: the professional body and professional conscience. Deontological codes; codes of ethics. University code of ethics. World Medical Association (WMA): Geneva Declaration, International Code of Medical

Ethics, WMA Declarations and Regulations. Romanian College of Physicians. Code of ethics of Romanian physicians commented.

- SCIENTIFIC RESEARCH ON HUMAN SUBJECTS AND THE DEVELOPMENT OF BIOETHICS. Ethical values of principlism. The importance of scientific research between individual need and social value. Risks and benefits. Vulnerable groups. Scientific dissemination. Conflict of interest in medical practice and research.
- Aspects of BIOETHICS OF THE BEGINNING OF LIFE
- Aspects of END OF LIFE BIOETHICS

COMPULSORY BIBLIOGRAPHY:

1. MEDICAL ETHICS ELEMENTS OF DEONTOLOGY AND BIOETHICS. Publishing House of Science Books, 2013
2. ELECTRONIC COURSE SUPPORT

RECOMMENDED OPTIONAL BIBLIOGRAPHY:

1. THE SCAFANDER AND THE FLUTURE. Jean Dominique Bauby
(The diving Bell and the Butterfly), 2008 Humanitas [http://www.imdb.com/title/tt0401383/]
2. IVAN ILICI'S DEATH. L. Tolstoy, Humanitas
3. MEDICAL ETHICS. Manual of medical Ethics. World Medical Association, WMA [http://www.wma.net/en/70education/30print/10medical_ethics/]

Year IV

CARDIOLOGY

ANALYTICAL PROGRAMME OF COURSES AND PRACTICAL WORK

(76 hours of courses, 152 hours of practical work)

COURSES

- Acute joint rheumatism. Rheumatic carditis;
- Mitral, tricuspid aortic and pulmonary valve diseases;
- Infective endocarditis;
- Rhythm and conduction disorders;
- Arrhythmogenesis, investigation and general treatment of arrhythmias. Paroxysmal supraventricular tachycardias. Ventricular tachycardias. Fibrillation, and atrial flutter. Extrasystolic arrhythmia. Pre-excitation syndrome. Atrioventricular blocks. Sunus node disease;
- Myocarditis;
- Cardiomyopathy (dilated, hypertrophic, primitive restrictive, specific);
- Acute and chronic pericarditis. Cardiac tamponade. Pericardial constriction,
- Adult congenital heart disease (ASD, VSD, coarctation of the aorta, PCA, tetralogy Fallot, pulmonary artery stenosis)
- Essential hypertension;
- Secondary hypertension;
- Risk factors. Atherogeneity;
- Angina pectoris (stable and unstable);
- Acute myocardial infarction, including its complications;
- Congestive heart failure (etiology, pathogenic mechanisms, clinical types, course and complications, treatment, prophylaxis);
- Acute pulmonary edema;
- Deep vein thrombosis;
- Pulmonary thromboembolism;

  For the chapters in the Medical Cardiology syllabus, the following will be noted: Definition, concepts of epidemiology, etiology, pathophysiology, clinical picture, methods of exploration, diagnosis, natural history, treatment, prophylaxis);

  In cardio-vascular surgery the courses have the following topic: indications and surgical treatment of valvulopathies and paricardium diseases.
- Indications and surgical treatment of congenital heart disease;
- Indications and surgical treatment of ischemic heart disease;
- Peripheral arterial disease. Acute peripheral ischemia syndrome.

Demonstrations - Non-invasive Cardiovascular Explorations (from clinical internship hours)

- Electrocardiography
  - Normal parameters
  - Cardiac hypertrophies
  - Myocardial ischemia and acute myocardial infarction
  - Stress electrocardiogram
  - Arrhythmias and conduction disorders
- Cardiovascular radiological exploration
- Principles of echocardiography .
- Bedside clinical internship, including case presentations, medical record interpretations and non-invasive cardiovascular explorations.

PNEUMOLOGY AND OCCUPATIONAL DISEASES/THORACIC SURGERY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

(66 hours of courses, 132 hours of practical work)

COURSES

- Functional explorations - fundamental principles
- Acute tracheobronchitis
- Chronic bronchitis
- Chronic obstructive pulmonary disease
- Bronchiectasis and pulmonary suppuration
- Bronchial asthma
- Penumonia (Bacterial, Viral, Chlamydia, Mycoplasma pneumoniae, nosocomial, in conditions of compromised immunity)
- Diffuse fibrosing interstitial pneumonias Sarcoidosis
- Lung tumours (primary and secondary)
- Pleurisy (tuberculous, non-tuberculous); Pleural empyema. Penumothorax. Mediastinal syndrome
- Respiratory failure, acute and chronic
- Primary and secondary pulmonary hypertension
- Chronic pulmonary cord

  For all pathology chapters, the definition, epidemiology, pathogenesis, morphopathology, clinical picture, paraclinical investigations, diagnosis, special types of disease evolution, complications, treatment, prognosis, prophylaxis are considered.
- Tuberculosis.
  - Tuberculosis epidemiology, main epidemiometric indicators Pathogenic mycobacteria
  - Immunity in tuberculosis: HIV-mycobacterial co-infection
  - Case detection, diagnosis and reporting
  - Radiological forms of tuberculosis
  - Differential diagnosis
  - Tuberculosis treatment (Anti-tuberculosis drugs, standard therapeutic regimens, monitoring of progress under treatment; evaluation of anti-tuberculosis chemotherapy; tuberculosis endemic control measures; national programme).
- Practical demonstrations:
  - Chest radiological investigation (technical procedures, elements of radiological semiology and differential diagnosis)
  - Computer tomographic investigation (main semiological elements
  - Bacteriological examinations in respiratory pathology: microscopic examination for mycobacteria; Zieli-Nielsen staining.
  - Functional investigation of the respiratory system (current techniques, recognition and diagnostic integration of the main syndromes;
  - Endoscopic investigation; technique, direct and secondary information, biopsy
  - Toracenteza. Tuberculin testing and BCG vaccination

- Epidemiological relationship survey (contact by touching)
- Clinical activity at the bedside
- The syllabus does not include the chapters taught in the "Infectious diseases" module)

DIGESTIVE

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

(46 hours of courses, 92 hours of practical work)

COURSES

- Sphageal pathology;
- Peptic ulcer;
- Gastritis;
- Upper gastrointestinal haemorrhage;
- Ulcerative-hemorrhagic colitis, Crohn's disease;
- Gastric cancer;
- Colon cancer;
- Irritable bowel syndrome, diagnosis of constipation;
- Malabsorption syndrome;
- Chronic diarrhea;
- Chronic hepatitis;
- Portal hypertension jaundice syndrome;
- Liver cirrhosis and major complications: ascites, encephalopathy hepatitis, hepatorenal syndrome;
- Acute and chronic pancreatitis;
- Gallstones and complications.

PRACTICAL WORK

- Presentation of the clinic
- Endoscopic semiology, criteria for interpretation of an endoscopy report, demonstrations
- Criteria for interpretation of an abdominal ultrasound report;
- Videoendoscopic demonstrations - colonoscopy;
- Anatomo-clinical confrontation;
- Rectosogmoidoscopy demonstrations;
- Upper digestive videoendoscopy demonstrations;
- Abdominal ultrasound demonstrations;
- Clinical internship. Videoendoscopy - colonoscopy demonstrations
- Therapeutic video endoscopy demonstrations;
- Diagnostic videoendoscopy demonstrations;
- Ultrasound demonstrations. Ultrasound demonstrations;

- Therapeutic videoendoscopy demonstrations;
- Clinical anatomical conference;
- Endoscopic sclerotherapy demonstrations;
- Abdominal ultrasound demonstrations;
- Diagnostic videoendoscopy demonstrations;
- Hospital case presentation;
- Abdominal ultrasound demonstrations;
- Upper digestive videoendoscopy demonstrations;
- Practical exam;
- Theoretical exam (grid test);

The bedside clinical internship will address issues related to:

- Diagnosis of highly morbid digestive diseases;
  - oesophagitis, gastritis, gastric ulcer, duodenal ulcer, malabsorption syndrome, upper digestive haemorrhages, lower digestive haemorrhages, functional dyspeptic syndrome, constipation, chronic hepatitis of various aetiologies, compensated liver cirrhosis, decompensated liver cirrhosis complications, acute and chronic pancreatitis (discuss for each type the criteria for clinical differential diagnosis and treatment algorithm);
- Diagnosis of high morbidity digestive cancer (gastric colonic, liver, pancreatic cancer - early diagnosis and staging algorithm;
- Radiological examination of the upper gastrointestinal tract: bedside film discussion;
- Radiological examination of the lower gastrointestinal tract: bedside film discussion;
- Radiological examination of the colicist and bile duct: bedside film discussion;
- Imaging exploration in gastroenterology and hepatology: computed tomography scintigraphy;
- Functional explorations in gastroenterology: interventional digestive esophageal ph-metry;
- Interventional digestive endoscopy;
- Interventional radiology;
- Liver biopsy puncture, demonstrations.

GENERAL SURGERY

ANALYTICAL PROGRAMME

(76 hours of courses, 152 hours of practical work)

COURSES

- History of surgery
- Surgical infection
  - Generalities, basics about sepsis
  - Localized infections (abscesses, cutaneous staphylococci, acute lymphangitis, acute adenitis)
  - Gas gangrene
  - Necrotizing fasciitis
  - Prophylaxis of tetanus sores
  - Hospital indoor infections
- Antibiotic therapy in surgery
- Acute infections of the fingers
- Soft tissue trauma
- Burns, frostbite
- Vascular pathology
  - Vascular trauma
  - Arteriovenous fistulas
  - Arterial aneurysms
  - Acute peripheral ischemia
  - Chronic obstructive arteriopathies
  - Varicose disease
  - Varicocele
  - Thromboembolic disease
  - Pulmonary embolism
  - Lymphatic pathology
- Diseases of the abdominal wall
  - Hernias
  - Post-operative events
  - Eviscerations
- Surgical pathology of the thyroid
  - Thyroiditis
  - Gușile
  - Hyperthyroid
  - Thyroid neoplasm

- Surgical pathology of the breast
  - Benign breast conditions
  - Breast neoplasm
- Surgical pathology of the chest
  - Chest trauma
  - Purulent pleurisy
  - Hydatid lung cyst
  - Diaphragmatic hernias
  - Diaphragmatic trauma
- Surgical pathology of the oesophagus
  - Oesophageal motor disorders
  - Esophageal diverticula
  - Caustic oesophagitis
  - Hiatal hernias
  - Gastroesophageal reflux disease
  - Benign tumours and cysts of the oesophagus
  - Esophageal neoplasm
- Surgical pathology of the stomach and duodenum
  - Ulcerative disease
    - Duodenal ulcer
    - Perforated ulcer
    - Haemorrhagic ulcer
    - Ulcerative stenosis
    - Gastric ulcer
    - Acute ulcer (stress ulcer)
    - Endocrine ulcer - Zollinger - Ellison syndrome
  - Suffering stomach operated for ulcerative disease
  - Benign tumours of the stomach and duodenum
  - Gastric neoplasm
- Surgical pathology of the small bowel
  - Congenital diseases of the small intestine
  - Diverticular disease of the small intestine
  - Pathology of Meckel's diverticulum
  - Crohn's disease (regional enteritis)
  - Tuberculosis of the small intestine
  - Irradiation enteropathy
  - Entero-measenteric infarcts
  - Chronic intesinal ischemia
  - Benign and malignant tumours of the small intestine and mesentery..

- External small bowel fistulas
- Small bowel failure of surgical causes

Analytical programme of the general surgery clinical internship

- Clinical examination methodology
  - Clinical Observation Sheet
  - Bioethics, ethics and forensics required in medical and surgical practice
  - Surgical semiology of the head and neck
  - Surgical semiology of the breast
  - Chest trauma semiology
  - Surgical semiology of the abdomen
  - Semiology of abdominal trauma
  - Urinary tract semiology
  - Surgical semiology of the limbs
  - Preoperative assessment of the surgical patient
  - Methodology of preoperative preparation of the surgical patient
  - Methodology of postoperative care of the surgical patient
  - Postoperative complications
  - Postoperative febrile syndrome

- Diagnostic techniques and therapeutic principles
  - Asepsis and antisepsis
  - Surgical instruments
  - Injections
  - The tiles
  - Incizia
  - Surgical suture
  - Drainage
  - Pleural drainage
  - Dressings
  - Bandages
  - Surgical bleeding and haemostasis
  - Cautery
  - Diagnostic and therapeutic puncture
  - Bleeding
  - Revulsia
  - Medical massage and mobilisation
  - Gastric lavage
  - Gastrointestinal aspiration
  - Bladder catheterisation - urine retention
  - Vulvovaginal toilet
  - Enema
  - Colostomy care

- Upper digestive endoscopy in general surgery
- Lower digestive endoscopy in general surgery
- Laparoscopic diagnosis and notions of minimally invasive approach therapy and telesurgery

- Getting care fundamentals in surgery
  - Anaesthesia
  - Monitoring
  - Elementary rules in hydric, electrolyte, metabolic and caloric rebalancing
  - Hydroelectrolytic and acid-base rebalancing
  - Blood groups
  - Blood transfusion
  - Nutrition of the surgical patient
  - Cardiorespiratory arrest
  - Cardiopulmonary resuscitation
  - Acute respiratory failure
  - Oxygen therapy
  - Tracheostomy
  - First aid in accidents
  - Principles of surgical oncology and chemotherapy
  - Irradiation treatment in general surgery
  - Organ transplantation

ORTHOPAEDICS AND TRAUMATOLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

(36 hours of courses, 72 hours of practical work)

COURSES

- History of orthopaedics and traumatology. Development of orthopaedics and traumatology in Romania
- Fractures
  - general
  - fractures (definition)
  - aetiopathogenesis
  - pathological anatomy
  - symptoms
  - Classification of invoices: AO classification concepts
  - evolution
  - fracture complications
  - open fracture
  - treatment of fractures
- Fractures of the thoracic limb
  - scapular, clavicle, scapula fractures
- Humerus fractures
  - Proximal extremity fractures
  - Humeral shaft fractures
  - Humeral blade fractures
- Forearm bone fractures
  - fractures of the proximal ulnar extremity
  - radial proximal extremity fractures
  - isolated diaphyseal fractures
  - diaphyseal fractures of both bones
  - forearm fractures and sprains
  - fractures of the distal radial extremity
  - fractures of the ulnar diastitial end
- Fractures of the carpal bones - scaphoid
- Metacarpal and phalangeal fractures
- Pelvic limb fractures
  - femur fractures: proximal extremity fractures (neck, trochanter); diaphyseal fractures; distal extremity fractures
  - patella fractures
  - fractures of the leg bones: tibial plateau fractures; diaphyseal fractures; tibial pillar fractures; malleolar fractures
  - fractures of the foot bones: talus fractures; calcaneus fractures; metatarsal fractures; phalangeal fractures
- Pelvic fractures
  - incident

  - the structure of the bony basin
  - production mechanism
  - classification
  - symptoms
  - diagnosis
  - evolution-prognosis
  - immediate complications
  - late complications
  - first aid
  - treatment
- Spinal trauma
  - incidence
  - spine structure
  - spine function
  - classification
  - symtomatology
  - diagnosis
  - complications
  - clinical forms, first aid, treatment
- Joint trauma sprains-dislocations
  - Entorse
  - More common sprains: ankle sprain; knuckle sprain
  - Dislocations
  - More common dislocations: scapulohumeral dislocation; hip dislocation; elbow dislocation
- Polytrauma
  - definition
  - incidence
  - pathogenesis
  - traumatic associations
  - evolution
  - first aid-transport
  - treatment-principles
- Infections
  - Osteomyelitis: acute osteomyelitis; chronic osteomyelitis
  - Osteoarticular tuberculosis
  - More common forms: spondylodiscitis; hip osteoarthritis; osteoarthritis of the knees
- Bone tumours
  - incidence
  - classification (WHO)
  - aetiopathogenesis
  - symptoms
  - radiology of bone tumours
  - paraclinical investigations
  - biopsy

  - evolution - Eneking standardisation
  - treatment
  - modern complex treatment
  - results
  - More common benign tumours: osteoma; osteoid osteoma; chondroma; osteochondroma; non-ossifying fibroma; haemangioma; giant cell tumour
  - Primary malignant bone tumours: osteosarcoma; parosteal sarcoma; chondrosarcoma; fibrosarcoma; malignant bone lymphoma; multiple myeloma; Ewing's sarcoma
  - Secondary malignant tumours-metastases
- Orthopaedic and surgical aspects of chronic inflammatory and degenerative rheumatism
  - Surgical indications in S.A.
  - Surgical indications in R.P.
  - coxarthrosis
  - gonarthrosis
  - atraumatic aseptic necrosis of the femoral head
- Spinal deformities
  - kyphosis
  - scoliosis

Analytical traineeship programme

- Semiology of traumatic conditions
- Semiology of orthopaedic conditions
- Notions of normal and pathological bone radiology
- Paraclinical investigations (indications, possibilities, limitations), laboratory, pathological anatomy, scintigraphy, CT, MRI
- Osteosynthesis materials
- First aid in traumatic conditions
- Most common fracture reduction manoeuvres
- Most common sprain reduction manoeuvres
- Gypsum Appliances
- Thoracic-brachial bandage
- Transskeletal extension
- Case presentations

Practical work

- Making a plaster splint
- Making a plaster cast machine
- Application of a thoraco-brachial bandage
- Reduction of scapulohumeral dislocation
- Reduction of elbow dislocation
- Reduction of clavicle fractures
- Reduction of fractures of the distal end of the radius
- Immobilisation of clavicle fractures

- Clinical examination of the knee
- Clinical examination of the ankle
- Clinical examination of the fist
- Clinical examination of the elbow
- Recognising bone lesions on an X-ray
- Recognition of osteosynthesis materials

PAEDIATRIC SURGERY AND PAEDIATRIC ORTHOPAEDICS

ANALYTICAL PROGRAMME OF COURSES AND PRACTICAL WORK

(26 hours of courses, 39 hours of practical work)

COURSES

- Cleft lip and palate. Meningoencephalocele. Malformations of the cervical region: cysts, fistulas, hemangiomas, lymphangiomas, torticollis.
- Oesophageal malformations. Diaphragmatic hernias.
- Hypertrophic pyloric stenosis. Congenital intestinal occlusions: duodenal malformations, intestinal malformations, meconium peritonitis, meconium ileus.
- Oblique region disorders; umbilical hernia, omphalocele, gastroschisis, Meckel's diverticulum
- Congenital megacolon. Ano-rectal malformations.
- Intestinal intussusception. Acute appendicitis. Mexenteric lymphadenitis. Acute primary peritonitis
- Abdominal trauma. Foreign bodies of the digestive tract
- Kidney malformations and tumours. Urethral and bladder malformations. Vesico-urethral reflux. Obstructive subvesical malformations
- Malformations of the genital organs in boys: hypospadias, epspadias. Genital malformations in girls
- Pathology of the peritoneal-vaginal canal; inguinal hernia, hydrocele, cord cyst, undescended testicle
- Congenital malformations of the locomotor system. Bone dystrophies and osteochondropathies
- Benign and malignant bone tumours. Osteo-articular tuberculosis in children. Osteomyelitis
- Congenital hip dislocation. Congenital clubfoot

Osteo-articular traumatic features in children. Obstetric fractures. Limb fractures in children.

ONCOLOGY

ANALYTICAL PROGRAMME OF COURSES AND PRACTICAL WORK
(8 hours of courses, 16 hours of practical work)

COURSES

- Definition and importance of clinical oncology
- Etiology of cancer
  - Exogenous (environmental) factors
  - Endogenous (host) factors
- Carcinogenicity
  - Basics of cancer cell molecular biology:
    - ⇒ Growth and differentiation factors
    - ⇒ Oncogenic genes
    - ⇒ Receptors and their role in oncogenesis
  - Main theories of carcinogenesis
- The natural evolution of cancer
  - Cancer cell
  - Factors that cause human tumours to grow
  - Local developments
  - Metastasis
- Cancer epidemiology
  - Definition and classification
  - Descriptive epidemiology
  - Analytical epidemiology
  - Experimental epidemiology
- Tumour classification criteria
  - Evolutionary criteria
  - Histogenetic criteria
  - Histological criteria
- Principles and methods of cancer diagnosis
  - Principles of cancer diagnosis
  - Means and methods of diagnosis in cancer
  - Stages of cancer diagnosis
  - Making and formulating a diagnosis in cancer
- Staging of cancer
  - Classification rules
  - TNM classification (UICC)
  - Classification p TNM
  - Other classifications
- Biological markers in cancer
  - Definition and value
  - Enzyme markers
  - Antigenic markers
  - Biochemical markers

  - Hormonal markers
  - Morpho-pathological markers
  - Genetic markers
- Paraneoplastic syndromes
  - Endocrine syndromes
  - Skin syndromes
  - Haematological syndromes
  - Nervous syndromes
  - Other paraneoplastic manifestations
- General principles of cancer treatment
  - therapeutic strategy and tactics in cancer
  - Choosing the first therapeutic sequence
  - Radicality and functionality
  - Therapeutic combinations
- Basics of surgical treatment
- Basics of radiological treatment
- Basics of cytostatic and hormonal treatment
- Biological therapy in cancer
- Therapy
- Emergencies in oncology

PRACTICAL WORK

- Preparation of the oncology clinical observation sheet
- Clinical oncology examination technique by systems and devices
- Demonstrations on diagnostic methods in cancer (imaging, endoscopic, laboratory, cytology and histopathological examination)
- Demonstration of direct and indirect signs of cancer
- Demonstration on the rules of standardisation in cancer
- Demonstrations on the role of prognostic factors (clinical, morphological and biological) in guiding therapy
- Demonstrations on sources and general rules of radiotherapy (in the RT department)
- Demonstrations on the main cytostatics and ways of administration (in the CHT department)
- Demonstrations on the general principles of cancer surgery (in the surgery department)
- Paraclinical demonstrations on general onco-pediatric data (in the onco-pediatric department)
- Methods for calculating indicators in descriptive and analytical cancer epidemiology

RADIOLOGY

COURSE SYLLABUS

(28 hours of courses, 28 hours of practical work)

COURSES

- Physical and biological bases of radiation (2 hours lecture, 2 hours practical demonstration) (physics of radiation production, component parts of the Röntgen apparatus; methods of optimizing the radiological image - TV amplifier, digitized image, etc. principles of radiological image formation; how radiation interacts with biological structures and elements of radiation protection)
- Radioimaging exploration of the chest I (2 hours lecture, 2 hours practical demonstration)
  - Methods of radioimaging exploration of the chest (1 hour)
  - Normal radiological aspects of the lung (1 hour) (drawing, lobes and segments, slices, large airways, etc.)
- Radioimaging exploration of the chest II (2 hours lecture, 2 hours practical demonstration)
  - Normal radiological aspects of the mediastinum and heart (1 hour) (elements of global and sectional radiological anatomy)
  - Pulmonary syndromes I (1 hour) (parietal, pleural, alveolar)
- Radioimaging exploration of the chest III (2 hours lecture, 2 hours practical demonstration). Pulmonary syndromes II (2 hours) (interstitial, bronchial, parenchymal, vascular, mediastinal).
- Semiology of changes in volume and configuration of the heart + Basic data on contrast exploration of peripheral vessels (2 hours lecture, 2 hours practical demonstration).
- Radioimaging of the digestive tract and adnexal organs I (2 hours lecture, 2 hours practical demonstration)
  - Examination techniques (1 hour)
  - Normal aspects and elementary dynamic and morphological radiological changes of the cavitary organs of the digestive tract (1 hour) (oesophagus, stomach).
- Radioimaging of the digestive tract and adnexal organs II (2 hours lecture, 2 hours practical demonstration). Normal aspects and elementary dynamic and morphological radiological changes of the cavitary organs of the digestive tract II (2 hours) (stomach, duodenum, small intestine, colon).
- Radioimaging of the digestive tract and adnexal organs III (2 hours lecture, 2 hours practical demonstration). Radiomagistic exploration of the liver, pancreas and bile ducts (exploration methods, principles, limiting indications).
- Principles of ultrasound, computerized, MRI and angiographic exploration of the viscera of the abdominal cavity (2 hours lecture, 2 hours practical demonstration) (principles of the method, terminology, basic semiology, indications)
- Radiological and imaging examination of the urinary tract I (2 hours lecture, 2 hours practical demonstration)
  - Urinary syndromes: obstructive syndrome (1st hour)
  - General semiology: elementary morphological and functional changes (1 hour)
- Radiological and imaging examination of the urinary tract II (2 hours lecture, 2 hours practical demonstration)
  - Urinary syndromes: obstructive syndrome (1 hour)
  - Urinary syndromes: tumoral, inflammatory, malformative syndrome (1 hour)
- Radiological and imaging examination of the osteo-articular system I (2 hours lecture, 2 hours practical demonstration)
  - Radiological and imaging exploration methods (1 hour)
  - Correlations between macro and microscopic morphological aspects of normal bone and radiological imaging (1 hour)

- Radiological and imaging examination of the osteoarticular system II (2 hours lecture, 2 hours practical demonstration). Elementary radiological changes (2 hours)
- Radiological and imaging examination of the osteoarticular system III (2 hours lecture, 2 hours practical demonstration)
  - Syndromes: inflammatory and tumoral
  - Getting to trauma
- Elements of emergency radiological diagnosis (indications, techniques, limits, incidents). Elements of arterial and non arterial interventional radiology (indications, current techniques, limits)

PRACTICAL WORK

- Lung - 4 hours course
  - Differential diagnosis of massive opacities
  - Differential diagnosis of micronodules and macronodules
  - Differential diagnosis of cavitations and diffuse lung pattern changes.
  - Pulmonary hypertransparency - localized, diffuse. Mediastinal tumour.
- Heart - 3 hours course
  - Positive and differential diagnosis of vascular changes
  - Radiological changes in valvulopathies
  - Radiological changes in congenital diseases, diseases of the great vessels and pericardium
- Digestive - 4 hours course
  - Diseases of the oesophagus and stomach (differential diagnosis)
  - Diseases of the duodenum and small intestine (differential dgn)
  - Colonic and extradigestive diseases with digestive distress
  - Diseases of the liver, pancreas and bile ducts
- Renal - 2 hours course
  - Positive and differential diagnosis of congenital diseases and renal inflammatory diseases
  - Tumour kidney, vascular kidney, transplant kidney

METHODOLOGY OF MEDICAL SCIENTIFIC RESEARCH

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK

(10 hours of courses and 10 hours of practical work)

COURSES

- Introduction - Definitions, terminology
- Working hypothesis, design and organisation of the study.
- Basic medical research in the era of genomics and proteomics.
- The role of morphological and imaging arguments in medical research.
- Literature research. Primary and secondary sources of medical literature.
- Choice of subjects: specifications, sampling and recruitment.
- Data collection. Evaluation and measurement strategies
- Confounding factors and systematic errors in scientific research. The placebo effect.
- Statistical power and sample size.
- Elements of general epidemiology. Clinical epidemiology: types of clinical trials.
  - Descriptive studies (cases and case series, ecological studies, cross-sectional studies)
  - Analytical studies (cohort, case-control, randomised clinical trials).
  - Diagnostic test evaluation studies.
  - Prognostic studies and creation of clinical prediction rules.
  - Secondary studies: systematic review and meta-analysis.
- Preparation, presentation, analysis and interpretation of results.
- Causality criteria in statistical association.
- Principles of evidence-based medicine.
- Medical research ethics
  - Standards of Good Laboratory Practice (GLP)
  - Good Clinical Practice Guidelines (GCP)
  - Standards of Good Epidemiological Practice (GEP)
- Dissemination of research results.
  - General rules for writing a scientific paper
  - Scientific poster communications
  - Oral scientific communications
  - The thesis

- Research grant
– Article

PRACTICAL WORK

1). Bibliography and citation of other authors. Medical bibliography databases and bibliographic utilities 2) Summary of data - Table 3) Graphical illustration of results - Figure 4) Data analysis - Part I - description of data - types of variables; measures of central tendency and dispersion; comparison of data (p-significance) 5) Data analysis - Part II - selection of appropriate statistical test 6). Types of clinical trials - case presentation - case-control study - cohort study - randomized clinical trial - notions of "good clinical practice" and "good laboratory practice" 7).Types of experimental research - "*in vitro*" and "*in vivo"* studies*;* stem cell; genetically modified animals 8).Writing of thesis, scientific article, oral communications, poster communications.

CLINICAL PHARMACOLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK (12 hours course, 12 hours practical work)

COURSES

- Cardiovascular module

– Inotropic-positive drugs: digitalis, phosphodiesterase inhibitors, sympathomimetics and dopamine.

– Antiarrhythmic drugs: quinidine and other sodium channel blockers, beta-adrenergic blockers, calcium channel blockers, amiodorone and other related antiarrhythmics.

– Antianginal: organic nitrates, beta-adrenergic blockers, calcium channel blockers.

– Antihypertensives: sympathoplegics, direct vasodilators, calcium channel blockers, converting enzyme inhibitors, diuretics.

- Respiratory module

– Antitussives: codeine and other opioid antitussives, synthetic antitussives.

– Expectorants and mucolytics: secretory-stimulating expectorants, secretolytic (mucolytic) expectorants - thiolicr compounds, bromhexine; surfactant.

– Antiasthmatics: bronchodilator sympathomimetics, parasympatholytics, theophylline and aminophylline, mast cell degranulation inhibitors, local and systemic glucocorticoids in bronchial asthma.

- Digestive module

– Drugs that predominantly influence digestive secretions: secretory stimulants, digestive enzymes.

– Antacids: antacids, gastric acid secretion inhibitors, mucosal protectors, chemotherapeutics active against Heliobacter.

– Prokinetic medication, antidiarrheals, laxatives, specific intestinal anti-inflammatories.

– In the Clinical Pharmacology courses, in addition to the presentation of the pharmacotherapeutic groups, a specific issue is emphasized: the methodology of drug evaluation under clinical conditions, adverse reactions, drug interactions, compliance problems, rational choice of drugs and therapeutic regimens according to the diagnosis and clinical situation.

Year V

RHEUMATOLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK (36 hours of course, 72 hours of course)

COURSES

- Antigen and the structure of the immune system;
- Immune response and reaction;
- Inflammation and cortisone anti-inflammatories;
- Non-steroidal anti-inflammatory and immunosuppressive drugs;
- Vasculitis;
- Systemic lupus eutematosus. Mixed collagen tissue disease;
- Scleroderma;
- Dermato and polymyositis;
- Rheumatoid arthritis and Sjogren's syndrome;
- Seronegative spondyloarthropathies (SpA);
- Reactive arthritis and psoriatic arthritis;
- Infectious arthritis and amyloid;
- Microcrystal-induced arthritis;
- Osteoporosis;
- Paget's disease, reflex dystrophy, Charcot disease;
- Arthritis;
- Lombosciatica and abducens rheumatism;
- Rheumatic manifestations in other diseases;
- Extra-articular manifestations of rheumatic diseases;
- Diff. topographic diagram of rheumatic diseases.

NEPHROLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK (36 hours of courses, 54 hours of practical work)

COURSES

- Nephrological clinical examination
- Proteins
- Hematuriile
- Pigments - haematoglobinuria, myclobinuria
- Piuria
- Renal edema
- Nephrogenic arterial hypertension
- Nephritic syndrome
- Nephrotic syndrome
- Glomerulopathies
  - Acute GND
  - GNRP
  - GEM
  - GNPP
  - Berger's disease
  - GSFS
- Urinary tract infections
- Interstitial nephropathies
- Kidney stones
- Acute renal failure
- Acute renal failure

PRACTICAL WORK

- Urine test
- Renal functional investigations
- Imaging exploration of the reno-urinary system
  - Radiographic examination
  - Renal arteriography
  - Renal phlebography
  - Isotopic nephrogram
  - Nephroscintigram
  - Renal sonography
  - Renal computed tomography
- Renal biopsy - morphological examination of the kidney

CLINICAL STAGES

- presentation of cases hospitalized during the period

PAEDIATRICS AND CHILDCARE

COURSE SYLLABUS

(76 hours of courses, 152 hours of practical work)

COURSES

- Growth and development
  - Definition, factors shaping growth and development
  - Somatic growth (intrauterine, postnatal, growth curves)
  - Psychomotor development
  - Main growth disturbances
- Infant and healthy baby feeding 2 courses (4 hours)
  - Macro- and micronutrient requirements at different ages
  - Infant feeding: natural, artificial and mixed feeding. Diversification.
  - Baby feeding outside the infant period
  - Dietary milk formulae in infant feeding ("adapted" and "semi-adapted" formulae, special formulae)
  - Infant and young child diet assessment
- Normal and pathological newborn 2 courses (4 hours)
  - Low birth weight and low birth weight newborn. Macrosomia at birth
  - Term newborn (clinical and neurological examination, adaptation to extrauterine life, physiological incidents, care)
  - Prematurity - morpho-physiological features, etiology, classification, complications, care
  - The dysmaturic newborn: etiology, morpho-functional features, care, complications
  - Birth asphyxia and cardiopulmonary resuscitation of the newborn
  - Newborn's Icterus
  - Neonatal respiratory distress. Idiopathic respiratory distress - etiopathogenesis, clinical picture, exploration, prophylaxis and treatment, complications, natural course
  - Newborn infections (bacterial, sd. Torch)
- Infant and child respiratory pathology 5 courses (10 hours)
  - Upper airway infections: acute rhinopharyngitis, acute rhinoadenopathy, acute eelworm, epiglitis, acute viral laryngotracheobronchitis, spasmodic croup, acute bacerial laryngotracheobronchitis. Otitis and otomastoiditis
  - Viral penumonias
  - Bacterial pneumonia - etiology, diagnosis
  - Penumococcal pneumonia. Pleuropulmonary staphylococcus. Bronchopneumonia
  - Bronchial asthma in infants and children
- Cardiovascular pathology of the infant and copulation 4 courses (8 hours)
  - Congenital neocyrogenic heart diseases:DSV, DSA, PCA
  - Cyanogenic congenital heart diseases: Fallot's teralogy, transposition of the great vessels
  - Coarctation of the aorta. Left heart hypoplasia syndrome
  - Heart failure
  - Shock
- Digestive pathology of infants and children 4 courses (8 hours)
  - Simple acute diarrhoeal disease
  - Acute diarrhoeal disease with dehydration
  - Chronic diarrhoea and malabsorption syndromes (congenital and acquired disaccharide intolerances, celiac disease and cystic fibrosis, chronic non-specific diarrhoea)
- Haematological pathology of infants and children 13 courses (26 hours)
  - Hypochromic hyposidermal anaemia
  - Macrocytic anaemia

  - Congenital and acquired hemolytic anemias
  - Aplastic anaemia
  - Acute lymphoblastic leukaemia
  - Acute nonlymphocytic leukaemia
  - Thrombocytopenias and thrombocytopathies
  - Hodgkin's disease
  - Non-Hodgkin's malignant lymphoma
  - Vascular purpura
  - Haemophilia
  - Histiocytosis X
- Renal-urinary pathology of infants and children 5 courses (10 hours)
  - Acute post-infectious glomerulonephritis
  - Nephrotic syndrome
  - Urinary malformations, vesicoureteral reflux and urinary tract infections
  - Acute renal failure
  - Chronic renal failure
- Infant and child nutritional pathology 4 courses (8 hours)
  - Protein and protein-energy malnutrition
  - Deficiency rickets - Rickettsial tetany
- Genetic pathology - inherited metabolic diseases 2 courses (4 hours)
  - Chromosomal abnormalities. Down's syndrome (trisomy 21) Down's syndrome. Turner (XO)
  - Diagnosis in hereditary metabolic diseases
  - Glycogenase. Lipid storage diseases. Phenylketonuria
- Acute poisoning (accidental and medicinal) 2 courses (4 hours)
  - Principles of pharmacokinetics of toxins in children
  - Clinical and paraclinical diagnosis in poisoning
  - Volatile hydrocarbon poisoning
  - Organophosphorus and organochlorine poisoning. Lead poisoning
  - Mushroom poisoning. Aspirin poisoning. Myophylline poisoning. Beladone poisoning. CNS depressant poisoning
  - First aid in poisoning.
  - Treatment in poisoning (general principles, antidotes, techniques of toxicological treatment)
- Paediatric HIV infection - AIDS 1 course (2 hours)

SURGERY

ANALYTICAL PROGRAMME OF COURSES AND PRACTICAL WORK

(56 hours of courses, 112 hours of practical work)

COURSES

- Trauma
  - Contusions, wounds, normal and pathological healing
  - Polytrauma. Emergency assistance in disasters. Road traffic injuries. Combined injuries
  - Burns– frostbite
- Surgical infection
  - General. Antibiotic therapy in surgery
  - Localized infections: warm abscess, folliculitis, boil, anthracoid boil, hydrosadenitis, acute lymphangitis, acute lymphadenitis, adenophlegmon
  - Diffuse and toxic infections: cellulitis, phlegmon, gas gangrene, septicaemia, septicopychaemia, tetanus prophylaxis, AIDS
  - Pancartitis and phlegmons of the hand
- Peripheral vascular disease
  - Arteries: arterial trauma, arteriovenous fistulas, arterial aneurysms, acute peripheral ischemia
  - Chronic obstructive arteriopathies
  - Varicose veins (hydrostatic, symptomatic). Varicoceles
  - Thromboembolic disease, post-thrombotic syndrome, lymphedema
- Diseases of the abdominal wall (excluding trauma)
  - Hernia: generalities, complications, therapeutic attitude
  - Topographic variety of hernias: inguinal, femoral, umbilical, white line, Spiegel, lumbar, obturator, perineal ischial, internal, diaphragmatic (excluding hiatal hernias)
  - Ripenings, eviscerations
- Thoracic surgical pathology
  - Chest trauma
  - Purulent pleurisy
  - Hydatid lung cyst
- Surgical pathology of the breast
  - Trauma. Acute (mastitis, paramastitis) and chronic infections (abscess, galactocele, TB, syphilis)
  - Dystrophic lesions. Benign tumours. Precancerous conditions. Secreting nipple
  - Malignant tumours
- Surgical thyroid diseases
  - Simple guşa
  - Hyperthyroid
  - Thyroid cancer
- Surgical pathology of the oesophagus
  - Trauma. Diverticula. Dyskinesias (cardiospasm - achalasia). Gastro-oesophageal reflux. Peptic oesophagitis. Esophageal syndrome
  - Post-caustic oesophagitis. Esophageal ulcer. Hiatal hernias. Benign and malignant tumours
- Surgical pathology of the stomach and duodenum
  - Gastric and duodenal ulcer resistant to medical treatment: general, clinical
  - Complications of gastric and duodenal ulcer: hemorrhage, perforation, penetration, stenosis, malignancy
  - Particular forms of gastric and duodenal ulcers: stress, endocardial, subcardial, prepyloric, postbulbar, anastomotic
  - Benign and malignant tumours
  - Pathology of the operated stomach

- Surgical pathology of the small bowel
  - Diverticuli. Regional and radiation enteritis. Intestinal TB
  - Entero mesenteric infarction. Chronic ischemia
  - benign and malignant tumours of the small intestine and mesentery
- Surgical pathology of the cecal appendix
  - Acute appendicitis. Chronic appendicitis
  - Appendicular tumours
- Surgical pathology of the colon
  - Megadolicocolon. Colonic diverticulosis. Ulcerative haemorrhagic colitis
  - Benign and malignant tumours
- Surgical pathology of the rectum
  - Anorectal prolapse
  - Benign and malignant tumours
- Ano-perianal surgical pathology
  - Hemorrhoids. Anal fissure. Infections (abscesses, phlegmons, fistulas)
  - Benign and malignant tumours
- Surgical pathology of the liver
  - Hepatic abscesses. hepatic hydatid cyst
  - Benign and malignant tumours
- Surgical pathology of the bile ducts
  - Vesicular lithiasis. Acute cholecystitis. Biliary ileus
  - Chronic nonlitiocytic cholestetopathies. Benign and malignant vesicular tumours
  - Main bile duct (MBD) lithiasis. Acute angiocolitis. Tumours of the C.B.P. (including vaterian ampuloma)
- Surgical pathology of the pancreas
  - Anomalies. Acute pancreatitis
  - Chronic pancreatitis. Cysts and pseudocysts. Pancreatic cancer
- Mechanical jaundice
- Spleen surgical pathology
  - Splenomegaly. Hypersplenism. Portal hypertension
  - Indications for splenectomy. Benign and malignant tumours
- Surgical acute abdomen
  - Abdominal trauma
  - Diffuse and localised acute peritonitis
  - Digestive and peritoneal haemorrhages
  - Intestinal occlusions

- Although the chapters of the syllabus were generally kept, 24 hours (40%) of the plan were reduced, which meant that the remaining chapters were not covered for long.

NEUROLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK
(64 hours of courses, 96 hours of practical work)

COURSES
- Disorders of consciousness
- Brain tumours
- Ischaemic stroke
- Haemorrhagic strokes
- Epilepsy
- Neuroinfections
- Inflammatory and degenerative diseases
- Traumatic brain injury
- Neurological investigations
- Neurosurgery

PRACTICAL WORK
- Anamnesis, particular attitude, meningeal syndrome
- Motility examination, active segmental movements, segmental muscle strength, paresis samples
- Muscle tone, passive movements
- Coordination
- Involuntary movements
- Normal and pathological reflexes
- Sensitivity
- Cranial nerves
- Peripheral nerves
- Vegetative disorders
- Language disorders
- Praxia
- Psychological examination
- Examination of a patient with abolished consciousness

CLINICAL DEMONSTRATIONS
- Stroke patients,
- Parkinson's disease,
- Korea
- Multiple sclerosis
- Cerebral ataxias
- Polyneuropathies, polyradiculoneuritis
- Muscular diseases
- Brain tumours
- Spinal cord compression syndromes
- Paraclinical investigations in neurology

UROLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK (26 hours of courses, 39 hours of practical work)

COURSES

- Urological semiology (pain, haematuria, cloudy urine)
- Urological semiology (polyuria, dysuria, incomplete and complete retention of urine)
- Non-specific infections of the male urinary and genital tract.
- Tuberculosis of the male genital and urinary tract
- Urinary tract infection
- Parenchymal renal tumours in adults and children
- Urothelial tumours
- Adenoma and prostatic cancer
- Testicular tumors. Urethral strictures
- Trauma of the male urinary and genital system

PRACTICAL WORK

- Objective examination of the urogenital system
- Patient presentations with urological signs, symptoms and syndromes
- Rectal cough (normal prostate, adenoma, prostate cancer)
- Urethro-vesical catheterization
- Suprapubic bladder puncture
- Urine collection for uroculture (female and male)
- Bacteriology laboratory (B. K. uroculture, urethral secretion)
- Research methods of B. Koch (direct examination, cultures)
- Cystoscopy and urethrocystoscopy (normal and pathological urethra + bladder)
- Ultrasound of the urinary tract
- Radiology of the urinary system (RRVS, UIV, cystography, urethrocystography, U>P>R>, arteriography, phlebography)
- Computed tomography of the urinary tract and M.R.N.
- Isotopic investigations (nephroscintigram, isotopic nephrogram, bone scintigram)
- Haemodialysis
- Basic notions of supravesical endourology (urethroscope, nephroscope)
- Basic ESWL and Laser
- Theraphy (for renal colic, urinary disorders, complete retention of urine, haematuria)

ENDOCRINOLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK
(28 hours of courses, 42 hours of practical work)

COURSES

- Endocrine system, endocrine glands - an introduction
  - Hormones, structure, transport, metabolism, mechanism of action;
  - Endocrine receptors: structure, regulation;
  - Endocrine regulatory systems.
- Neuroendocrinology - neurosecretions of the hypothalamic-pituitary system
- Hypothalamus - anatomy, physiology
  - Hypothalamic pathology
    - ⇒ diabetes insipidus
    - ⇒ syndrome of inadequate secretion of DNA
    - ⇒ pituitary isolation syndrome
- Adenohypophysis
  - anatomy
  - Hormonology (structure, regulatory mechanisms of action)
- Empthy sella syndrome
- Pituitary adenomas
  - classification
  - pituitary tumor sd. clinic
  - diagnosis, treatment
  - Pathology of GH hypersecretion; actomegaly, gigantism, giant-aczomegaly
  - Pathology of prolactin hypersecretion
- Adult pituitary insufficiency
  - Classification, diagnosis, treatment
  - Endocrine dwarfs - classification
  - Pituitary dwarfism: diagnosis, treatment
- Thyroid
  - anatomy
  - Hormone biosynthesis mode of action, regulation
- Thyroid hyperfunction - thyrotoxicosis: classification etiopathogenesis, clinical diagnosis, treatment
- Thyroid hyperfunction: classification etiopathogenesis, clinical diagnosis, treatment
- Parathyroids: anatomy; physiology.
- Phospho-calcium homeostasis (vitamin D3, parathormone, calcitonin)
- Parathyroid hypofunction
- Parathyroid hyperfunction
- Endocrine osteoporoma: classification, diagnosis, treatment
- Endocrine hypertension - clinical, diagnostic and therapeutic features in various endocrine diseases
- Adrenal cortices: anatomy; hormonology: biosynthesis, action, regulation
- Cushing's suprarenometabolic syndrome: classification etiopathogenesis, clinical diagnosis, treatment
- Adrenogenital syndrome: clinical forms, diagnosis, treatment

- Primary hyperaldosteronism
- Primary and secondary, chronic and acute adrenal insufficiency
- Medullary adrenal: anatomy; physiology
- Pheoctomycinoma - clinical diagnosis, treatment
- Multiple endocrine neoplasia syndrome
- Normal and pathological sexuality: stages: normal and pathological puberty; menopause
- Gonad: anatomy; hormonology
- Gonadal pathology: ovarian and testicular failure
- Endocrine infertility

PRACTICAL WORK

Practical work will be carried out in the form of presentation of patients by teachers (demonstrations) and examination of patients by students in the clinic. The aim will be for each student to learn how to examine an endocrine patient independently, to write an observation sheet specific to the endocrinology clinic, to recommend treatment, to know the patient's evolution.

The practical work will apply in the clinic the knowledge of the general practitioner about endocrine diseases taught in the course.

- Diseases of the hypothalamus and pituitary gland
  - Diabetes insipidus (clinical forms)
  - Inadequate vasopressin secretion syndrome
  - Pituitary tumour syndrome (micro and macroprolactinoma, GH-secreting tumour, iatrogenic post adrenalectomy cortiocopic tumour, hyposecreting and non-secreting tumour).
  - Acromegaly (adult hypersomatotropic syndrome)
  - Gigantism and statural hypertrophies
  - Pituitary microsomia (pituitary dwarfism), prepubertal and pubertal plurihormonal pituitary insufficiency.
  - Hyperprolactin syndrome of women and men
  - Postpartum pituitary insufficiency (Sheechan syndrome)
  - Iatrogenic pituitary insufficiency (posthypophysectomy post isotope implantation).
  - Empthy sella syndrome
  - Pituitary Isolation Syndrome
  - Craniopharyngioma
- Thyroid diseases
  - Endemic oligosymptomatic, endocrinopathic, endemic cretinism goiter.
  - Non-toxic nodular goiter (solitary, plurinodular nodule)
  - Graves Basedow Disease
  - Nonexophthalmic hyperthyroidism (hyperthyroid, toxic thyroid adenoma, thyrotoxicosis, thyrotoxic coma).
  - Congenital and infantile myxedema
  - Adult myxedema (autoimmune, postthyroidectomy, post radioactive iodine treatment).
  - Infantile and adult hyperthyroidism.
  - Acute, subacute and chronic thyroiditis.
  - Thyroid cancer
- Parathyroid diseases
  - Hyparathyroidism (idiopathic and iatrogenic chronic tetany)
  - Primary hyparathyroidism

- Catecholamine diseases
  - Pheochromocytoma (hypercatecholaminergic tumor syndrome)
- Adrenal diseases
  - Primary chronic adrenocortical insufficiency (Addison's disease)
  - Cushing's syndrome and Cushing's disease (hypercortisol syndrome)
  - Reactive hypercortisol syndrome (hypercorticism)
  - Corticosteroid-induced hypercortisol syndrome (iatrogenic Cushing's syndrome).
  - Adrenogenital syndrome (virilizing congenital hyperplasia of the adrenal cortex).
  - Adrenocortical tumor syndrome with virilization.
  - Adrenocortical hirsutism, hypertrichosis, acne and seborrhea.
  - Primary and secondary hyperaldosteronism.

- Ovarian diseases
  - Intersex (female pseudohermaphroditism)
  - Normal and delayed female puberty
  - Precocious puberty, female pseudo precocious puberty
  - Ovarian agenesis (Turner syndrome)
  - Polycystic ovary syndrome and ovarian hirsutism
  - Female ovarian failure during the fertility period, menstrual cycle disorders, anovulatory menstrual cycle, secondary amenorrhea.
  - Female infertility, hormonally induced conception, physiological pregnancy, hormonal disorders of pregnancy.
  - Diseases of the mammary gland, early telarche, micromastia, anisomastia, macromastia, galactorrhea, benign breast dysplasia, breast cancer.
  - Hyperestrogenism, hyperestrogenic mastosis, premenstrual syndrome.
  - Endocrine syndrome of ovarian involution, menopause, postmenopause, senescence.
- Testicular diseases
  - Intersex (male pseudohermaphroditism).
  - Normal and delayed male puberty.
  - Precocious puberty and male precocious pseudopuberty.
  - Cryptorchidism, testicular agenesis, gynecomastia, pseudogynecomastia.
  - Testicular dysgenesis syndrome (Klinefelter).
  - Feminizing testis syndrome.
  - Adult testicular insufficiency (hormonogenesis and spermatogenesis).
  - Sequential dynamic disorder syndrome.
  - Male infertility, hormone-induced fertility
  - Climacterium, male postclimacterium and senescence.

DIABETES

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK (8 hours of courses, 12 hours of practical work)

COURSES

- Diabetes. Classification. Clinical. Diagnosis.
- Etiopathogenesis of type I diabetes mellitus.
- Etiopathogenesis of type II diabetes.
- Acute complications of diabetes.
- Chronic complications of diabetes. Clinical. Treatment.
- Antidiabetic treatment.
- Insulin treatment in diabetes.
- Oral antidiabetic treatment.
- Hypoglycemia.
- Obesity. Etiopathogenesis.
- Obesity. Complications.
- Obesity. Treatment.
- Hyperuricemia gout. Pathogenesis. Treatment.
- Hyperlipoproteinemias. Clinical. Treatment.

THEMATICS. STUDENTS YEAR V

- Physiology of carbohydrate metabolism and regulation of glucose homeostasis.
- Diabetes. Definition. Diagnosis. Classification. Clinical forms.
- Etiopathogenesis of type II diabetes.
- Etiopathogenesis of type I diabetes.
- Diabetic treatment.
- Insulin treatment.
- Chronic complications: Clinical
- Chronic complications: treatment
- Inter-relationship with metabolic balance.
- Oral treatment.
- Hypoglycemia.
- Severe hypoglycemia in diabetes.
- Acute complications: diabetic ketoacidosis; hypersomolar coma and lactic acidosis.
- Anamnestic and clinical examination peculiarities in the diabetic patient.

Diabetes education.

PUBLIC HEALTH AND MANAGEMENT

ANALYTICAL PROGRAMME OF COURSES AND PRACTICAL WORK
(32 hours of courses, 32 hours of practical work)

COURSES

- Health status
  - Ethical foundations of public health
  - Identifying and prioritising public health
  - Birth rate, fertility, family planning
  - Mortality (crude rates and cause-specific mortality rates)
  - Morbidity and its consequences. Design and use of mass medical examinations to measure it
  - Descriptive epidemiological surveys in public health
  - Epidemiological analytical and intervention surveys in public health
- Health promotion and preventive medicine
  - Preventive strategies
  - Health education and health promotion
  - Screening and prevalence testing
  - Medico-social problems of vulnerable population groups
- Health services and management
  - The role and principles of management applied to health services
  - Financing health services
  - Health economics and methods of economic evaluation of health services
  - Quality assurance of health services - principles and accountability
  - Health systems and their reform

PRACTICAL WORK

- Getting descriptive statistics - tables and graphs.
- Information and indicators in public health epidemiology.
- Birth notification, measurement and analysis of births, fertility and mortality.
- Notification of deaths, measurement of overall mortality.
- Methods of general mortality analysis - comparison, standardisation.
- Methods for analysing infant mortality.
- Designing different types of epidemiological surveys.
- Choosing the appropriate type of epidemiological survey to verify an epidemiological hypothesis.
- Risk measurement and analysis in epidemiological, analytical surveys.
- Validation and prediction in screening and diagnostic tests.
- Identification and prioritisation of health problems.

- Methods of payment of the doctor.
- Developing a project.
- Randomised clinical trials.
- Communication methods in health promotion.
- Social marketing in health promotion.

TOXICOLOGY

ANALYTICAL PROGRAMME OF THE COURSE AND PRACTICAL WORK
(16 hours of courses, 16 hours of practical work)

COURSES

- General toxicology
  - Toxicology as a medical discipline, field of interdisciplinary correlations;
  - Epidemiological aspects of acute poisoning;
  - The notion of toxic - toxicity;
  - Acute toxicity, qualitative aspects, quantitative parameters;
  - Toxicant classification criteria;
  - Toxodynamic mechanisms
  - Receptors in toxicology;
  - Toxicokinetics (general):
    - ⇒ absorption
    - ⇒ distribution - redistribution
    - ⇒ storage, target organs
    - ⇒ metabolism - bioactive
    - ⇒ delete
  - Antidotes - antidotes:
    - ⇒ definition
    - ⇒ classification
    - ⇒ presentation of important antidotes.
- Medical management in acute poisoning:
  - Stabilization of vital functions, priorities;
  - Daily assessment:
    - ⇒ symptoms relevant to toxicological diagnosis, toxidromes;
    - ⇒ analytical toxicological diagnosis;
    - ⇒ exogenous toxic coma, peculiarities.
  - Measures to remove the toxicant from the site of absorption (portals of entry into the body: external and internal decontamination);
  - Measures to increase toxicant removal:
    - ⇒ change in plasma and urinary pH;
    - ⇒ forced diuresis;
    - ⇒ hemodialysis, hemoperfusion;
    - ⇒ Seriously activated charcoal.
  - Antidote, peculiarities in relation to the type of intoxication;
  - Supportive therapy, monitoring of vital functions, complex rebalancing, maintenance of antidote plasma levels, etc.;
  - Psychological assessment.
- More frequent clinical intoxications: (mechanism and toxidynamic effects, symptomatology, clinical and laboratory diagnosis, stabilization, antidotes, supportive therapy)
  - Alcohols (ethanol, methanol, ethylene glycol);
  - Insecticides (C.O.F., carbamates, organochlorines);
  - Mushrooms;
  - Metals (Pb, Fe, As, Hg);
  - Solvents, carbon tetrachloride;
  - Barbiturate;
  - Cyclic antidepressants;
  - Benzodiazepines;
  - Neuroleptics;

- Opioids;
- Paracetamol, salicylates;
- Izoniazid;
- Cyanides;
- Hydrogen sulphide, CO, ammonia;
- Beta-blockers, calcium-blockers, clonidine.

PRACTICAL WORK

- Medical management in acute poisoning:
  - At the scene of the accident:
    - ⇒ removal from the toxic environment (e.g. CO, NH_3, H_2S, natural gas, etc.);
    - ⇒ external and internal decontamination (with respect to basic rules);
    - ⇒ administration of coal (according to specific indications);
    - ⇒ measures to prevent deterioration of vital functions;
    - ⇒ if necessary, administration of the antidote (e.g. C.O.F. poisoning, isoniazid, carbamates, Amanita muscaria mushrooms, etc.).
  - During transport:
    - ⇒ supervision of the intoxicated person to prevent obstruction of the airways;
    - ⇒ O_2 administration;
    - ⇒ catheterisation of a peripheral vein;
    - ⇒ possibly assisted breathing with a Ruben balloon on the mask or I.O.T.
    - ⇒ antidote
  - In-hospital:
    - ⇒ Rapid assessment (screening) of vital function disorders according to priorities:
      - a. breathing
      - b. cardio-circulatory functions
      - c. CNS (coma, seizures, delirium, etc.)
      - Application of measures to correct vital functions and prevent deterioration of the intoxicated person's clinical condition (stabilization of vital functions)
      - d. decontamination, if still appropriate (if not carried out "on the spot" or in a timely manner)
    - ⇒ Complete diagnostic evaluation of the intoxicated person:
      - - background data, causes, sources
      - - objective examination
      - - specific toxicological investigations
      - - other paraclinical investigations
      - - positive diagnosis, differential diagnosis
    - ⇒ Decision on antidotes (where available), complex rebalancing of the intoxicated person
      - monitoring vital functions
    - ⇒ Supportive therapy for acute intoxication.
- Presentation of clinical cases:
  - clinical examination, identification of toxic condition
  - presumptive diagnosis
  - recommendation of paraclinical investigations
  - positive and differential diagnosis
  - therapeutic recommendations, orthodoxy, supportive therapy

Computerised toxicological information.

YEAR VI

INFECTIOUS DISEASES

COURSE SYLLABUS AND PRACTICAL WORK
(56 hours course, 84 hours practical ~~work)~~

COURSES

- **Etiology of infectious diseases:** classification and characteristics of pathogens involved in the main infectious diseases: bacteria, viruses, fungi, parasites, infectious agents, non-conventional agents (prions). Human commensal flora;
- **Definition and classification of infections. Pathogenesis of infectious diseases;**
- **Mechanisms of anti-infectious defence**: non-specific defences (anatomical barriers, inflammatory reaction, phagocytosis, non-specific plasma and tissue factors). Specific defences (humoral and cellular immunity). Inborn and acquired immune deficiencies;
- **Diagnosis of infectious diseases -** epidemiological, clinical and laboratory diagnosis (haematological, biochemical, bacteriological, virology, parasitology, mycology, molecular biology;
- **Antibacterial therapy** (antibiotic therapy) - general concepts, antibacterial activity (bactericidal and bacteriostatic effect, concentration-dependent antibiotics, in vitro evaluation of antibacterial activity - MIC, CMB), concepts of pharmacokinetics and pharmacodynamics, mechanisms of action of antibiotics, mechanisms of bacterial resistance to antibiotics, rules and principles of judicious antibiotic therapy;
- **Description of the main classes of antibiotics**: (beta-lactams, aminoglycosides, glycopeptides, macrolides, lincosamides and ketolides, cyclins, phenolics, rifamycins, oxazolidinones, fluoroquinolones, polymyxins, sulfonamides and trimethoprim, imidazoles, other classes of antibiotics); main representatives of the class, mechanism of action, antibacterial spectrum, indications, contraindications, adverse effects, drug interactions, dosage, mechanisms of bacterial resistance.
- **Non-etiological therapies in infectious diseases:** anti-thermal therapy, anti-inflammatory therapy (NSAIDs and corticosteroids), immunomodulatory therapy. Fever of unspecified aetiology: aetiology (infectious and non-infectious causes), positive and differential diagnostic algorithm, therapeutic approach.
- **Vaccines/Immunoglobulins/Heterologous sera.**
- **Acute inflammatory response syndrome, sepsis and septic shock:** definitions, epidemiology, pathogenesis, etiology, clinical manifestations, laboratory diagnosis, positive and differential diagnosis, course, prognosis, complications, treatment, specific and non-specific prophylaxis. Bacterial endocarditis.
- **Acute febrile eruptive infectious diseases:** measles, rubella, chickenpox, herpes zoster (definition, epidemiology, pathogenesis, etiology, clinical manifestations, laboratory diagnosis, positive and differential diagnosis, course, prognosis, complications, treatment, specific and non-specific prophylaxis.
- **Angina. Scarlet fever. Diphtheria. Infectious mononucleosis** (definition, epidemiology, pathogenesis, aetiology, clinical manifestations, laboratory diagnosis, positive and

differential diagnosis, course, prognosis, complications, treatment, specific and non-specific prophylaxis.

- **Influenza and acute upper respiratory tract infections:** definition, pathogenesis, etiology, clinical manifestations, laboratory diagnosis, positive and differential diagnosis, course, prognosis, complications, treatment, specific and non-specific prophylaxis.
- **Acute lower respiratory tract infections: bronchitis and acute exacerbations of COPD; acute pneumonia, pleural empyema** (definition, epidemiology, pathogenesis, etiology, clinical manifestations, laboratory diagnosis, positive and differential diagnosis, prognostic course, complications, treatment, specific and non-specific prophylaxis);
- **Other airborne infections: whooping cough, mumps**: definition, epidemiology, pathogenesis, etiology, clinical manifestations, laboratory diagnosis, positive and differential diagnosis, course, prognosis, complications, treatment, specific and non-specific prophylaxis;
- **Acute meningitis and encephalitis:** definition, epidemiology, pathogenesis, etiology, clinical manifestations, laboratory diagnosis, positive and differential diagnosis, course, prognosis, complications, treatment, specific and non-specific prophylaxis;
- **Viral meningitis. Bacterial meningitis. TB meningitis**;
- **Acute infectious diseases with neurological involvement (poliomyelitis, botulism, tetanus)**: definition, epidemiology, pathogenesis, etiology, clinical manifestations, laboratory diagnosis, positive and differential diagnosis, course, prognosis, complications, treatment, specific and non-specific prophylaxis;
- **HIV/AIDS infection**: definition, epidemiology, pathogenesis, etiogenesis, clinical manifestations, classification, laboratory diagnosis;
- **HIV/AIDS infection**: positive and differential diagnosis, evolution, prognosis, complications, treatment, specific and non-specific prophylaxis;
- **Acute gastrointestinal infections**: definition, aetiology, pathogenesis and aetiopathogenic classification (inflammatory and non-inflammatory). Food poisoning;
- **Dysentery, cholera, post-antibiotic diarrhoea, Clostridium Difficile diarrhoea, typhoid fever** (definition, epidemiology, pathogenesis, aetiology, clinical manifestations, laboratory diagnosis, positive and differential diagnosis, course, prognosis, complications, treatment, specific and non-specific prophylaxis.
- **Acute viral hepatitis with hepatitis A and E viruses:** epidemiology, pathogenesis, etiology, clinical manifestations, laboratory diagnosis, positive and differential diagnosis, course, prognosis, complications, treatment, specific and non-specific prophylaxis.
- **Acute viral hepatitis with liver viruses B, C, D:** epidemiology, pathogenesis, etiology, clinical manifestations, laboratory diagnosis, positive and differential diagnosis, course, prognosis, complications, treatment, specific and non-specific prophylaxis;
- **Zoonoses - Leptospirosis, Anthrax, Rabies** (definition, epidemiology, pathogenesis, etiology, clinical manifestations, laboratory diagnosis, positive and differential diagnosis, course, prognosis, complications, treatment, specific and non-specific prophylaxis;
- **Infections in the immunosuppressed. Nosocomial infections** (definition, epidemiology, pathogenesis, aetiology, clinical manifestations, laboratory diagnosis, positive and

differential diagnosis, course, prognosis, complications, treatment, specific and non-specific prophylaxis).

- **Travel-related infectious diseases:** definition, epidemiology, diagnosis, treatment, specific and non-specific means of prophylaxis.

SEMINARS/PRACTICAL WORK

- LP2 - Presentation of universal precautions for the prophylaxis of nosocomial infections transmitted by blood and other biological fluids from patients;
  Presentation of non-specific measures to prevent airborne and digestive transmission of infectious diseases;
  Presentation of occupational health and safety rules during the Infectious Diseases internship;
  Presentation of the rules for preventing and fighting fires in the workplace (PSI) and the rules to be observed in the event of emergencies (earthquakes, etc.);
- LP2 - Visit to the Bacteriology Laboratory (3 hours);
- LP3 - Visit to the Virusology Laboratory (3 hours);
- LP4 - Visit to the Molecular Genetics Laboratory (3 hours);
- LP5-LP28 - Bedside clinical case presentations from the course topics (3 hours);

EPIDEMIOLOGY

COURSE SYLLABUS AND PRACTICAL WORK
(12 hours course, 12 hours practical work)

COURSES

- Epidemiology - definitions, methods, basic processes
  - definition, purposes, use and fields of application;
  - epidemiological vs. clinical method;
  - infectious process.
- Epidemiological process
  - Source of infection;
  - Mode and routes of transmission;
  - Responsiveness.
- Epidemiological process
  - Forms of manifestation;
  - Favouring factors.
- Epidemiological surveillance. Epidemiological investigation
  - Epidemiological surveillance:
    - Definition;
    - System utility and attributes;
    - Data collection and analysis;
    - Data interpretation and dissemination.
  - Epidemiological investigation in communicable disease
    - Preliminary epidemiological investigation;
    - Definitive epidemiological investigation.
- Surveillance, prevention and control of communicable diseases:
  - Healthcare associated infections - importance of the problem, definitions, legislative framework;
  - Preventing and limiting the transmission of micro-organisms in healthcare facilities.
- Surveillance, prevention and control of communicable diseases:
  - Parenterally transmitted infections;
  - Airborne, waterborne, vector-borne infections;
  - Sexually transmitted infections.

SEMINARS/PRACTICAL WORK

- General information on passive immunoprophylaxis
  - Indications and limits;

- Organic products;
- Principles of management;
- Attitude in plague with tetanogenic potential.

- Active immunoprophylaxis (National Immunisation Programme, vaccines used in the NIP)
  - General recommendations on vaccination;
  - Vaccination calendar;
  - Vaccines used in PNV.

- Active immunoprophylaxis
  - Vaccines recommended for certain risk groups;
  - Optional vaccinations.

- Protection of medical personnel (Standard precautions. Hand hygiene. Biological exposure injury)
  - Standard precautions
    - Protective equipment;
    - Safety of injections;
    - Cough etiquette.
  - Hand hygiene
    - Importance;
    - Recommended techniques;
    - Directions.
  - Biological exposure accident
    - HBV post-exposure management;
    - HCV post-exposure management;
    - HIV post-exposure management.

- Decontamination, disinfection, sterilisation and management of medical waste:
  - Decontamination
    - Definition;
    - Classification;
    - Means of decontamination;
    - Decontamination levels
  - Sterilisation
    - Definition;
    - Classification of types of instruments;
    - Means and methods of sterilisation;
    - Sterilisation control

- Management of healthcare waste
  - Definition;
  - Classification;
  - Waste collection;
  - Packaging waste;
  - Temporary storage;
  - Transport;
  - Final elimination.

- Epidemiological intervention in communicable disease (stages of epidemiological investigation)
  - Preliminary epidemiological investigation;
  - Definitive epidemiological investigation.

OPHTHALMOLOGY

COURSE SYLLABUS AND PRACTICAL WORK
(16 hours course, 24 hours practical work)

COURSES

- Anatomy of the eyeball and appendages. Notions of optics and refraction;
- Pathology of the adnexa (orbit, eyelids, tear ducts);
- Pathology of the conjunctiva;
- Pathology of the cornea and sclera;
- Pathology of the uvea and lens;
- Pathology of the retina and optic nerve;
- Glaucoma;
- Eyeball trauma.

PSYCHIATRY

COURSE SYLLABUS AND PRACTICAL WORK
(36 hours course, 54 hours practical ~~work)~~

COURSES

- Classification of mental disorders in adults, epidemiological data. Notions of etiology - concept of vulnerability; Combating stigma;
- Semiology. Perception disorders. Attention and memory disorders;
- Semiology. Thought disorders. Communication disorders. Motor behaviour disorders. Motor behaviour disorders. Affective disorders. Disorders of consciousness;
- Delirium. Dementia;
- Psychoactive substance use disorders - alcohol use;
- Psychoactive substance use disorders - alcohol use;
- Mental disorders caused by the use of psychoactive substances - stimulants, cannabis, cocaine, hallucinogens, opioids, sedatives, hypnotics, anxiolytics;
- Syssophrenias;
- Other psychotic disorders - acute psychotic disorders, schizophreniform disorder, schizoaffective disorder, delusional disorder, induced delusional disorder;
- Mood disorders - depressive episode, manic episode, major depressive disorder, bipolar affective disorder;
- Mood disorders - dysthymia, anxiety disorders, dissociative disorders, eating disorders;
- Personality disorders;
- Psychotropic treatment (classification, neuroleptics, antidepressants, antidepressants, antipsychotics, anxiolytics and hypnotics);
- Psychotherapeutic interventions, general concepts, other biological and psychosocial therapies;
- Legal and ethical issues. Mental Health Act, Rules for the application of the Mental Health Act;
  The responsibility of the family doctor for the care of the mentally ill.

CLINICAL INTERNSHIPS/PRACTICAL WORK

- Psychiatric interview, medical history, history of illness, interview with caregiver;
- Psychiatric examination: perception disorders;
- Psychiatric examination; attention and memory disorders;
- Psychiatric examination; thought and communication disorders;
- Psychiatric examination; motor behaviour disorders;

- Psychiatric examination: affective disorders;
- Psychiatric examination: disorders of consciousness, personality disorders;
- Confusional states - delirium, dementias, mental disorders secondary to somatic diseases;
- Substance use disorders;
- Schizophrenias, schizophreniform disorders, schizoaffective disorder, schizotypal personality disorder;
- Psychotic disorders: acute psychotic disorders, persistent delusional disorder, induced delusional disorder;
- Mood disorders - depressive episode, manic episode, recurrent depressive disorder, bipolar affective disorder;
- Anxiety disorders, somatoform disorders, dissociative disorders, eating disorders, adjustment disorders;
- Factitious Disorders and Simulation, Mental Health Act and the Rules for the Application of the Act;

ENT

COURSE SYLLABUS AND PRACTICAL WORK
(26 hours of courses, 39 hours of practical work)

COURSES

- ENT and cranial nerve clinical examination;
- Rhinology - Part I;
- Rhinology - Part II;
- Pharyngology - Part I;
- Pharyngology - Part II;
- Laryngology - Part I;
- Laryngology - Part II;
- Otology - Part I;
- Otology - Part II;
- Otology - Part III;
- Cranio-cervico-facial allergy;
- Tracheal and oesophageal pathology;
- ENT emergencies.

CLINICAL INTERNSHIPS/PRACTICAL WORK

- Inspection and palpation of the cervicofacial region;
- Narinoscopy;
- Anterior rhinoscopy;
- Posterior rhinoscopy;
- Oropharyngoscopy;
- Indirect laryngoscopy;
- Auditory evidence;
- Vestibular evidence;
- Otoscopy;
- Cranial nerve examination;
- ENT endoscopic examination;
- Anterior and posterior nasal packing;
- Tracheostomy surgery and care.

DERMATOLOGY

COURSE SYLLABUS AND PRACTICAL WORK
(26 hours of courses, 39 hours of practical work)

COURSES

- Anatomy and physiology of the skin. Elementary lesions in dermatology (correlations with clinical syndromes);
- Skin rashes;
- Bacterial skin infections (including leprosy and cutaneous TB). Cutaneous parasitosis;
- Superficial skin mycoses;
- Connectivity with cutaneous expression: lupus, scleroderma, dermatomyositis;
- Genetic and immunological bullous diseases;
- Vitiligo. Cutaneous vasculitis. Notions of dermatopediatrics. Sexually transmitted infections: gonococcal infection, Chlamydia, trichomoniasis;
- Psoriasis. Lichen plan;
- Hives and dermatitis. Atopic dermatitis;
- Syphilis. Cutaneo-mucosal manifestations in HIV-AIDS infection;
- Acne. Rosacea. Eritem polymorph. Stevens Johnson syndrome. Lyell's syndrome;
- Cutaneous sunburn. Benign skin tumours. Dermoscopy. Borderline tumours. Non-melanoma malignant skin tumours;
- Cutaneous and mucosal melanoma. Secondary tumours;
- Summary

SEMINARS/CLINICAL WORKSHOPS

- The clinical internship is carried out at the bedside, following the course syllabus, and with the support of digital images or atlases for example. The main diagnostic and treatment techniques specific to the specialty (dermoscopy, focused cryotherapy, skin biopsy) are also presented;

OBSTETRICS-GYNAECOLOGY AND NEONATOLOGY

COURSE SYLLABUS AND PRACTICAL WORK
(56 hours course, 84 hours practical ~~work)~~

COURSES

- Gametogenesis. Ovulation. Fertilisation. Nidation. Placentation. Placenta physiology;
- Maternal physiology: adaptive changes in the maternal body during pregnancy;
- Prenatal diagnosis. Principles and methods. Fetal anomalies and malformative syndromes;
- Determinism of labour; Uterine contraction; Mechanism of birth in flexed cranial presentation; Birth periods;
- Dynamic dystocia; Mechanical dystocia;
- Deflected cranial presentations. Pelvic presentation. Transverse presentation;
- Bleeding in the first part of pregnancy - abortion. Extra-uterine pregnancy. Gestational trophoblastic disease;
- Haemorrhages in the second half of pregnancy - Placenta praevia. Premature expulsion of normally inserted placenta (abruptio placentae). Uterine rupture;
- Physiological bark. Pathological lactation;
- Premature birth; Prolonged pregnancy;
- High blood pressure in pregnancy. Amniotic fluid pathology;
- Intrauterine growth restriction. Acute fetal distress. Fetal death in utero;
- Multiple pregnancy. Incompatibility in the RH and ABO system;
- Infectious diseases associated with pregnancy;
- Pregnancy-related maternal pathology;
- Menstrual cycle. Menstrual cycle disorders;
- Lower genital infections. Pelvic inflammatory disease;
- Urinary incontinence. Pelvic static disorders;
- Uterine fibromatosis. Uterine malformations;
- Precursor lesions of cervical cancer. Cervical cancer;
- Cancer of the uterine body. Endometriosis;
- Ovarian tumours - benign and malignant;
- Benign and malignant breast pathology;
- Couple infertility and notions of assisted reproduction;
- Puberty. Menopause;
- Newborn at term. Premature newborn;
- Neonatal emergencies;
- Particular clinical entities in neonatology;

CLINICAL INTERNSHIPS/PRACTICAL WORK

- Obstetrics and Gynaecology Observation Sheet. Obstetric clinical examination. Clinical gynaecological examination. Clinical examination of the breast and axillae;
- Anatomy, histology, embryology and physiology of the genital organs;
- Obstetric basin. Bone basin. Soft pelvis;
- Fetal mobility - the foetus at term;
- Definition, signs and diagnosis of pregnancy: Clinical diagnosis of pregnancy, laboratory diagnosis, paraclinical investigations, biological constants of pregnancy. The concept of "pregnancy with unspecified location";
- Birth attendance in flexed cranial presentation. Deflected presentations. Obstetric analgesia;
- Birth attendance in pelvic presentation. Obstetric manoeuvres;
- Deliverance and attitudes in deliverance. Bleeding in postpartum. Shock in obstetrics;
- Perinetomy. Epiziotomy. Indications, technique, incidents;
- Fetal monitoring - fetal active movements, NST, biophysical profile, monitoring in labour;
- Obstetric ultrasound;
- IT interventions - trophoblast biopsy, amniocentesis - Indications. Genetic counselling. Maternal blood karyotype. Fetoscopy and intrauterine interventions;
- Fetal malformations - significance, malformative syndromes;
- Caesarean section;
- Supervision of lactation. Pathology of lactation. Puerperal infection;
- Prenatal consultation. Drugs in pregnancy: teratogenesis;
- High obstetric risk pregnancy;
- Vaginal biocenosis. Vaginitis. Vaginosis. Vaginal cytological examination;
- Diagnostic algorithm for cervical lesions. HPV infection. Colposcopy;
- Bleeding diagnostic algorithm;
- Diagnostic algorithm of urinary incontinence in women;
- Diagnostic algorithm for subfertility in couples;
- Contraception. Family planning - clinical cases;
- Pre-operative preparation of the patient for gynaecological procedures. Specific investigation techniques in obstetrics and gynaecology;
- Operative techniques and principles in obstetrics and gynaecology - open pelvic surgery, laparoscopy, hysteroscopy, robotic surgery, external ablation methods;
- Clinical examination of the newborn, VG determination, Ballard score, newborn classification;
- Newborn care in the delivery room (umbilical cord clamping, oro-pharyngeal unclamping, initiation of breathing, saturation monitoring);
- Resuscitation of the newborn in the delivery room, knowledge of the algorithm, intensive care equipment.

FORENSIC MEDICINE

ANALYTICAL PROGRAMME OF COURSES AND PRACTICAL WORK (16 hours of courses, 24 hours of practical ~~work)~~

COURSES

- Thanatology. Vital response, forensic anthropology, forensic entomology;
- Diagnosis of death;
- Sudden death. Completion of the medical certificate;
- Forensic trauma. Mechanical traumatic agents and traumatic injuries. Craniocerebral trauma. Traumatic shock. Physical traumatic agents: temperature and pressure variations, electricity, explosions;
- Chemical traumatic agents: forensic toxicology, general toxicology and narcotics. Biological traumatic agents;
- Particular circumstances and mechanisms of injury and death. Falling, precipitation, shooting, heteroaggression by human means, self-aggression, battered child syndrome, traffic accidents by road, ship, rail. Asphyxia (anoxia);
- Forensic sexology (abortion, newborn murder), forensic genetics (forensic genetics, filiation), forensic serology (blood groups, HLA);
- Forensic psychiatry. Simulation of traumatic injuries and illnesses. Causality in forensic medicine. Elements of medical professional liability;

SEMINARS/LABORATORY WORK

- Getting started. History of forensic medicine in Romania. Organization of the forensic institutional system. Reasons for requesting forensic examinations. Types of forensic examinations and types of forensic documents;
- Disjunctive criteria for the diagnosis of death;
- Violent death and non-violent death. Suspicious death. More common causes of sudden death. Completion of the medical certificate of death by violent and non-violent causes of death;
- Forensic examination of the living person: recording of traumatic injuries and examination in case of rape;
- Forensic Laboratory;
- Forensic autopsy - violent death - traumatic circumstances, self/heteroaggression;
- Forensic autopsy - accidental violent death;
- Forensic autopsy - sudden death. Forensic museum.

FAMILY MEDICINE

COURSE SYLLABUS AND PRACTICAL WORK
(26 hours of courses, 39 hours of practical work)

COURSES

- Introduction: definition of family medicine, place of family medicine in the health care system, factors that have contributed to the promotion of family medicine, functions and principles of family medicine, primary health care - content, limits;
- Preventive medical activity in family medicine: medical problems of healthy people, importance of prevention in primary health care, primary, secondary, tertiary and specific prevention, methods of prevention, combining preventive and curative activity;
- Immunization prophylaxis of infants, children and adults, main vaccines used, types of vaccines used, indications and contraindications, vaccine calendar, mandatory vaccines, optional vaccines, vaccination catagraphy, passive immunoprophylaxis;
- Childbirth concepts, examination and care of the newborn and infant, feeding techniques, feeding diversification concepts, growth and development, perinatal physiology, prematurity, postmaturity, dysmaturity;
- Adolescent development and major diseases: physical development, sexual development, intellectual and emotional development, adolescent pathology;
- Family planning activity in family medicine: aims of family planning, content of family planning activity, family planning counselling methods, contraceptive methods, sexually transmitted diseases (HIV, chlamydia, HPV, lues);
- Pregnancy care in family medicine: elements of diagnosis in pregnancy, early detection of pregnancy, pregnancy monitoring, detection of risk factors, pregnancy and pathological lactation;
- The main diseases of the child: respiratory diseases (HCAI, bronchiolitis, pneumonia, bronchial asthma), digestive diseases (acute diarrhea, recurrent painful abdomen, intestinal parasitosis), genito-urinary diseases (urinary infections, emuresis), infectious diseases, deficiency diseases of infants and young children (anemia, rickets, dystrophy);
- Main cardiovascular diseases of adults: risk factors for cardiovascular disease, obesity, metabolic syndrome X, diabetes mellitus, arteriosclerosis;
- The main emergencies in family medicine: first aid, treatment of epistaxis, hypertensive crisis, bronchial asthma crisis, acute myocardial infarction, renal colic, acute urinary retention, biliary colic, appendicular colic, digestive haemorrhage, anaphylactic shock;
- Main adult respiratory diseases (COPD, Bronchial Asthma, Atopic Terrain);
- Main adult diseases: duodenal gastric ulcer, chronic hepatitis, irritable bowel syndrome, dyspeptic syndrome, colon neoplasm. Main adult metabolic diseases: diabetes mellitus, dyslipidaemia, atherosclerosis, obesity, metabolic syndrome X;
- Care of the elderly, aging process, assessment of the elderly, peculiarities of pathology and treatment of the elderly. End-stage diseases, palliative treatments, control of terminal symptoms, family support, home care of the terminally ill patient, rights of the terminally ill patient.

PRACTICAL WORK

- Specific problems faced by the family doctor: factors on which the requests of the family doctor depend, criteria for assessing the requests, structure of preventive and curative requests of the family doctor, rules for setting up the family doctor's practice, managerial requests of the family doctor;
- Structure of the family doctor's office: space conditions, conditions related to the equipment of the family doctor's office, family doctor's team and working hours, basic records (capitation list, consultation records, records of general consultations, pregnancy records, treatment records, vaccination records, records of consultations at home), presentation of the forms. Package of services provided by the family doctor: preventive services, curative services, special services (care of pregnant women, children, the elderly and the chronically ill), management of the family doctor's practice, setting up the family doctor's practice, coordination of the family doctor's team;
- Relations of the family doctor with the health insurance company: conditions for concluding the contract with the insurance company, medical services paid by the insurance company, curative medical services, medical services for emergency situations, financial management of the family doctor's practice. Relations of the family doctor with other specialists, fellowship, multidisciplinary medical consultation;
- Prophylactic services in family medicine: aims of preventive activity, primary, secondary and tertiary prophylaxis, prophylactic care in the community (prevention methods used in communities, preventive services that can be offered by the family doctor), indicators for assessing the health status of the population. Identification and control of risk factors: assessment of the main risk factors, possibilities of measuring risk, mechanism of action of the various risk factors, objectives of risk factor management. Periodic check-ups: content and periodicity of check-ups in different age groups and special population categories;
- Vaccination catagraphy: compulsory vaccinations, optional vaccinations, contraindications and precautions. Drawing up a catagraphy;
- Periodic review examinations: content and periodicity of review examinations in different age groups and special population categories;
- Family planning and contraceptive methods: definition, content of family planning activity, non-hormonal contraceptive methods, hormonal contraceptive methods;
- Screening and dispensing of pregnant women: diagnosis of pregnancy, selection of high-risk pregnancies, content and frequency of consultations of pregnant women, mandatory paraclinical examinations during pregnancy;
- Newborn care and development follow-up: pregnancy and birth history, general clinical examination of the newborn, recommendations made at the first visit, promotion of natural feeding, regular examinations of the newborn and infant;
- The role of the family doctor in screening and dispensing communicable diseases: measures taken by the family doctor when a new case of tuberculosis, HIV/AIDS, acute viral hepatitis, lues occurs;
- The particularities of consultation in family medicine: determining factors, particularities of consultation determined by the place, structure, time and the limited means of the family doctor, consultation at the patient's home. Therapeutic patient education: factors influencing patient compliance with treatment, clear preparation of the therapeutic plan;
- The peculiarities of first aid in family medicine: application of first aid measures in the family practice in case of cardio-respiratory arrest, hypertensive emergencies, myocardial infarction, asthmatic malaise, acute urinary retention and anaphylactic shock;

- Surveillance of the chronically ill: main chronic diseases, active dispensing of main chronic diseases, content and periodicity of clinical and paraclinical examination of chronic diseases (cardiovascular diseases, diabetes, respiratory diseases, digestive diseases, renal diseases, collagen diseases). Palliative care in family medicine: definition, components of palliative medicine, main signs and symptoms of terminally ill patients, management of chronic pain;

HEMATOLOGY

COURSE SYLLABUS AND PRACTICAL WORK
(26 hours course, 39 hours practical work)

COURSES

- Hematopoiesis:
  - Classification
  - Anaemia
- Megaloblastic anemias;
- Hypochromic anaemia;
- Haemolytic anaemias;
- Acute leukaemias (I);
- Acute leukaemias (II); Chronic lymphoproliferative syndromes;
- Monoclonal gammopathy;
- Malignant lymphoma;
- Hodgkin's disease. Chronic myeloproliferative syndromes (1);
- Chronic myeloproliferative syndromes (2);
- Haemostasis - exploration;
- Haemostasis pathology (I);
- Haemostasis pathology (II);

CLINICAL STAGES

- Direct exposure of clinical cases/patients with haematological diseases admitted to Haematology Departments;
- Display and interpretation of normal and pathological blood counts (types of diseases);
- Normal and pathological coagulation: interpretation;
- Presentation of modern tools for the study of haematological diseases: cytogenetics/FISH, flow cytometry, molecular biology

PHYSICAL MEDICINE AND REHABILITATION

COURSE SYLLABUS AND PRACTICAL WORK
(14 hours of courses, 14 hours of practical work)

COURSES

- **Introductory course**
  - Definition, philosophy, history;
  - Size, purpose and particularities of the specialty: from prophylaxis to recovery and family and socio-professional reintegration;
  - Objectives and results of Medical Recovery in connection with body functions and activities;
  - Categories of therapy used in recovery: pharmacological therapy, non-pharmacological therapy (physical therapy, psycho-behavioural therapy, speech therapy, forms of complementary therapy);
  - Quality of life and medical ethics issues in Medical Recovery and Physical Medicine;
  - Present and Prospects in Medical Recovery: Robotics, virtual reality, medical research, physiatric interventions used in other specialties/domains (PUVA - in dermatology, negative pressure in reaming and mechanical venous thrombosis prophylaxis - in ATI, possibly neuro-recovery -, extracorporeal shock wave therapy - in urology, respectively in orthopedics - defibrillation - in cardiology, ATI, emergency medicine, phoronephrosis - in onco-hematology -, electrofusion in regenerative biology, etc);
  - RMFB multidisciplinary team; specific infrastructure
- Diagnosis and assessment in medical rehabilitation
  - Features of clinical-functional assessment, significance of functional deficit;
  - International Classification of Function and Disability (ICF);
  - Assessment in Recovery: tests, clinical-functional analytical assessment scales, global functional, assessment for exercise training, quality of life;
  - Pain in RMFB: deconditioning syndrome (somatic, visceral, psycho-behavioral);
  - Role and significance of paraclinical assessment in Recovery (e.g. Blood, urine, ECG, spirometry, exercise assessment, ex radio-imaging, soft tissue ultrasound, thermography, EMG, evoked potential collection).
- Specific therapeutic tools in Medical Recovery (I):
  - Physical Therapy: definition, classification;
  - Mechanisms of action, therapeutic effects and methodological principles of physical therapy in Electrotherapy, Thermotherapy and Hydrotherapy, Photo/Heliotherapy, Ultrasound Therapy, Therapeutic Massage (classical and specific techniques);
  - Indications, contraindications, therapeutic application limits of physical therapy procedures and methodologies;

- Specific therapeutic tools in medical rehabilitation (II):
  - ***Kinetotherapy and hydrokinetotherapy***: definition, classification, anatomo-functional basis, kinetotherapy objectives and application methodologies, indications, contraindications, therapeutic application limits;
  - ***Kinetopophylaxis***: primary, secondary;
  - ***Occupational Therapy/Ergo Therapy***: definition, classification, specific objectives and methodologies of application, indications, contraindications, limits of therapeutic application;
  - ***Orthotics/prothesis***: definition, classification, objectives and application methodologies, indications, contraindications;
  - Assistive ***devices and techniques***;
  - ***Psychotherapy-logopaedics;***
- **Balneoclimatotherapy: prophylactic, curative and rehabilitation**
  - Classification of Natural Therapeutic Factors (NTFs); spa infrastructure;
  - Spa screening, spa crisis, categories of neuronal/ locomotor and visceral pathologies benefiting from balneoclimatic therapy or phase III recovery programmes;
  - ***Climatotherapy*** in prophylaxis and general pathology: definition, classification, effects and mechanisms of action, application methodologies, indications, contraindications;
  - ***Therapeutic mineral waters***: definition, classification, effects and section mechanisms, application methodologies, indications, contraindications;
  - ***Peloidotherapy***: definition, classification, effects and mechanisms of action, application methodologies, indications, contraindications;
  - ***Therapeutic natural gases*** (mophetes, sulphates): definition, classification, effects and mechanisms of action, application methodologies, indications, contraindications;
  - ***Thalassotherapy***: definition, effects and mechanisms of action, application methodology, indications, contraindications;
  - ***Speleotherapy***: definition, effects and mechanisms of action, application methodology, indications, contraindications;
- **Elements of fMRI in neurological pathology**:
  - Peripheral neuropathies, lower motor neuron syndrome: specific clinical and paraclinical evaluation;
  - Specific rehabilitation goals in radial nerve palsy, carpal tunnel syndrome, brachial plexus palsy, lumbar, sacral crural nerve palsy, sciatic, RLS, PES, application methodologies, limitations of medical rehabilitation;
  - Neuropathic pain in recovery;
  - Upper motor neuron syndrome: clinical-functional assessment, specific tests and scales for clinical-functional assessment, paraclinical assessment;
  - The clinical-functional picture, specific objectives and methodologies for the application of recovery programs in: stroke, non-traumatic trauma (cerebral or/and medullary: para/di-/tri-tetra-/hemi-plagues, secondary psycho-cognitive-behavioral statuses - all

including in polytraumatic context), Parkinson's disease, multiple sclerosis, muscular dystrophies;

- Lumbar, cervical, thoracic disc disease, including radicular involvement: clinical and functional assessment, therapeutic and rehabilitation goals, complex therapeutic and rehabilitation programmes - including in operated disc herniation (HD);

- Elements of fMRI in orthopaedic-traumatic pathology:
  - Clinical and functional assessment of post-traumatic sequelae, prolonged immobilization syndrome;
  - Specific objectives and methodologies for the implementation of recovery programs for post-traumatic sequelae (joint, periarticular, vascular-nervous, complex);
  - **Elements of CBMR in cardiovascular and respiratory pathology**
  - Clinical and functional assessment in coronary patients with hypertension and peripheral vascular pathology (arteriopathy, varicose veins in lower limbs, lymphatic oedema);
  - Clinical and functional assessment of the patient with respiratory pathology and respiratory dysfunction of restrictive or obstructive type;
  - Specific objectives and application methodologies of rehabilitation programs in cardiovascular and respiratory pathology, value of exercise training for rehabilitation programs;
  - **Elements of FMRI in pediatric pathology**: scoliosis, BMI, post-traumatic sequelae;
  - **Elements of RMFB in geriatric pathology**: deconditioning syndrome in the elderly under normal and pathological conditions, recovery in locomotor, post-traumatic, neurological, dysmetabolic degenerative pathologies;
  - **Elements of BFRM in oncology and post-combustion pathology respectively**: specific clinical-functional assessment; therapeutic and recovery solutions (secondary lymphatic oedema, somatic deconditioning, chronic somatic pain syndromes, algo-dysfunctional suffering through fibrous retractions).

MEDICAL EMERGENCIES AND FIRST AID

COURSE SYLLABUS AND PRACTICAL WORK
(20 hours of courses, 20 hours of practical work)

COURSES

- Pathological conditions characterized by acute dyspnea;
- Pathological conditions characterized by acute chest pain;
- Hypertensive emergencies;
- Arrhythmic emergencies;
- Sudden death, CPR and syncope;
- Digestive emergencies: acute medical abdomen, digestive haemorrhages and jaundice syndromes;
- Metabolic emergencies;
- Acute renal failure;
- Neurological emergencies;
- Various emergencies - hypo- and hyperthermia, strangulation, electrocution, etc;

SEMINARS/CLINICAL WORKSHOPS

- Daily practical activity during which students are able to examine patients, learn how to perform routine investigations such as electrocardiography, learn the significance and usefulness of specific investigations such as echocardiography and become familiar with the care of patients with cardiovascular disease.

ATI

COURSE SYLLABUS AND PRACTICAL WORK
(12 hours of courses, 12 hours of practical work)

COURSES

- Anesthesia:
  - Definition;
  - Substances;
  - Techniques;
  - Vascular approach;
  - Liver function.
- Patient monitoring, acute cardiovascular failure and resuscitation;
- Polytrauma, burns, multiple organ dysfunction syndrome, shock states, sepsis;
- Respiratory failure, coma and brain death;
- Acid-base balance and dyselectrolytes;
- Volemic, transfusion therapy and acute renal failure, nutrition of the critically ill patient;

CLINICAL STAGES

- Cardiopulmonary resuscitation and vascular approach;
- Airway protection;
- Interpretation of critical patient monitoring;
- General clinical examination and paraclinical tests in the critically ill patient;
- Mechanical ventilation;
- Differential diagnosis of the main pathologies in the ICU.

PLASTIC, AESTHETIC AND RECONSTRUCTIVE MICROSURGERY

ANALYTICAL PROGRAMME OF COURSES AND PRACTICAL WORK
(16 hours of courses, 24 hours of practical work)

COURSES

- Definition and history of Plastic Surgery. Basic principles and techniques in Plastic Surgery;
- Burns and frostbite;
- Upper limb plastic surgery. Malformations of the upper limb;
- Reconstructive microsurgery;
- Tumour pathology of the integument and soft tissue;
- Plastic surgery of the cephalic extremity. Craniofacial malformations;
- Extensive acute infections of the integument and underlying tissues (clinical, diagnosis, treatment). Management of chronic wounds. Reconstruction of the abdominal wall and perineum;
- Elements of cosmetic surgery. Breast reconstruction.

SEMINARS / PRACTICAL WORK

- Basic Principles and Techniques in Plastic Surgery;
- Basic techniques in burn patient care;
- Basic Techniques in Hand Surgery;
- Basic Techniques in Reconstructive Microsurgery;
- Basic techniques in oncoplastic surgery;
- Basic techniques in Plastic Surgery of the cephalic extremity;
- Basic techniques in the care of extensive acute infections, chronic wounds and abdominal wall reconstruction;
- Basic Techniques in Aesthetic Surgery. Basic techniques in breast reconstruction.