PATHOLOGY Curriculum
for 2024/2025 academic year
V semester: 60 hrs
GENERAL PATHOLOGY (31 hrs)
1.Lecture:
Introduction to pathology… .....1 hr
Definition, object of study, historical development of pathology, methods, task and importance in diagnostic therapy and prognosis of diseases, importance of pathology in scientific research in medicine.
2. Lecture:
Basic pathology of cell and extracellular matrix… ..... 6 hrs
Causes and mechanisms of cell injury. Reversible and irreversible cell injury. Subcellular responses to injury. Necrosis. Apoptosis. Cellular adaptations to injury. Hyperplasia, hypertrophy, atrophy and metaplasia. Intracellular accumulations of lipids and glycogen. Intracellular and extracellular accumulations of proteins (hyaline changes and amyloidosis). Disturbances of pigments substances. Pathologic calcification.
Seminar: **Basic pathology of cell and extracellular matrix**
Microscopic slide demontrations:
Histopathological features of basic injury of cells and extracellular matrix
Atrophia et sclerosis testis (Testicular atrophy with sclerosis)
Atrophia fusca hepatic (Brown atrophy of the liver)
Amyloidosis renis (Renal amyloidosis)
Amyloidosis lienis (Amyloidosis of the spleen)
Hyalinosis vasorum lienis (Hyalinosis of the blood vessels)
Infiltratio adiposa myocardii (Fatty ingrowth of the myocardium)
Metamorphosis adiposa hepatis diffusa (Fatty change of the liver)
3. Lecture:
Inflammation and infective diseases… .....6 hrs
General considerations and definition. Acute inflammation (vascular changes, cellular events, defects in leukocyte function, chemical mediators of inflammation, inflammation-induced tissue injury). Chronic inflammation (chronic inflammatory cells and mediators, granulomatous inflammation). Morphologic patterns in acute (serous, fibrinous, purulent) and chronic inflammation. Etiology of inflammation. Systemic effects of inflammation. General pathology of infectious diseases. Tuberculosis. Sarcoidosis. Lues. Viral, fungal and parasitic diseases.
Tissue repair..... 1 hr
Cell regeneration. Repair by connective tissue – granulation tissue. Wound healing. Mechanisms involved in repair. Factors modifying the quality of reparative response
Seminar: P**athology of inflammation and repair**
Microscopic slide demontrations:
Histopathological features of inflammation
Pleuritis fibrinoso-purulenta (Fibrinous-purulent pleuritis)
Abscessus hepatic (Liver abscess)
Phlegmone cutis (Phlegmone of the skin)
Appendicitis phlegmonosa (Phlegmonose appendicitis)
Lymphadenitis tuberculosa (TBC) (Tuberculous lymphadenitis)

Morbus Parkinson (Parkinson disease)
Granuloma corporis alieni (Foreign body type granuloma)
4. Lecture:
Circulatory disorders.....4 hrs
Edema. Hyperaemia (active and passive). Haemorrhage. Hemorrhagic diathesis. Shock. Thrombosis. Embolism. Ischaemia and infarction.
*Seminar:***Pathology of hemorrhage**
Microscopic slide demontrations:
Histopathological features of circulatory disorders
Hyperaemia passiva pulmonis chronica (Chronic lung congestion/Lung hemosiderosis)
Necrosis hepatis centralis haemorrhagica (Central hemorrhagic necrosis of the liver)
Hyperaemia passiva lienis chronica (Chronic passive congestion of the spleen)
Thrombus venae in organisatione (Organization of the venous thrombus)
Infarctus anaemicus renis (White/anemic infarct of the kidney)
Infarctus haemorrhagicus pulmonis (Hemorrhagic infarct of the lung)
5. Lecture:
Transplantation..... 1 hr
Morphology of hyperacute, acute and chronic rejection. Methods of increasing graft survival. Transplantation of bone marrow and solid organs. Graft-versus host disease.
6. Lecture:
Immunopathology… .....2 hr
Immunologic tissue injury (hypersensitivity reactions). Autoimmune diseases. Immunologic deficiency syndromes. Primary immunodeficiencies. Acquired immunodeficiency syndrome (AIDS).
7. Lecture:
Genetic and pediatric diseases .....2 hrs
Terminology and classification of genetic diseases. Mechanisms of genetic diseases. General characteristics of pediatric tumors. Benign tumors of childhood. Malignant pediatric tumors: neuroblastic, Wilms tumor, rhabdomyosarcoma, pediatric lymphomas.
8. Lecture:
Nutritional diseases: Protein malnutrition. Vitamin deficiencies. Obesity .....**1 hr**
9. Lecture:
Environmental diseases.....1 hrs
Injuries by chemical and physical agents. Effects of ionizing radiation.
10. Lecture:
Neoplasia. ..... 6 hrs
Tumor terminology and classification. Tumor components and secondary changes in tumors. General characteristics of benign and malignant tumors. General pathology of epithelial and mesenchymal tumors. Metastatic spread and localization of metastases. Local and systemic effects of tumors on the host. Oncogenes and antioncogenes. Tumor modifications of normal cell control mechanisms (DNA repair , apoptosis, telomeric activity, adhesion molecules). Carcinogens (chemical, radiation, viral). Grading and staging of cancer. Diagnostic techniques in oncologic pathology.
*Seminar:***General pathology of neoplasia: Grading and staging of cancer, Diagnostic techniques in oncologic pathology**

Microscopic slide demontrations:
Histopathological features of benign and malignant tumors
Papilloma mucosae oris (Oral mucosal papilloma)
Polypus cervicis uteri (Cervical polyp)
Adenoma tubulare intestini coli (Adenomatous polyp of the colon – tubular adenoma)
Malignant cells on smear preparation (Malignant cells in cytological smear)
HSIL cervicis uteri (Cervical high grade squamous intraepithelial lesion (HSIL)
Adenocarcinoma pulmonis (Lung adenocarcinoma)
Carcinoma metastaticum in medulla ossis (Metastatic carcinoma to the bone marrow)
Carcinoma metastaticum in nodo lymphatico (Metastatic carcinoma to the lymph node)

SYSTEMIC PATHOLOGY (59 hrs)
11. Lecture:
Skeletal system, joints and soft tissue tumors .....5 hrs
Bone remodeling. Congenital and hereditary disorders. Osteomyelitis. Osteoporosis. Rickets and osteomalacia. Renal osteodystrophy. Paget's disease (Osteitis deformans). Fibrous dysplasia. Osteoarthritis (Degenerative joint disease). Infectious arthritis. Rheumatoid arthritis. Arthritis associated with rheumatic fever. Gout and gouty arthritis.
Soft tissue tumors… ..... 1 hr
Seminar: **Tumors of the skeletal system**
Microscopic slide demonstrations:
Histopathological features of bone and joint diseases and soft tissue tumors
Synovitis chronica (Chronic synovitis)
Osteomyelitis chronica (Chronic osteomyelitis)
Chondroma
Sarcoma Ewing (Ewing's sarcoma)
Tumor gigantocellulare (Giant cell tumor)
Osteosarcoma
Lipoma
Leiomyoma
Rhabdomyosarcoma
Liposarcoma
12. Lecture:
Pathology of the head and neck .....1 hr
Pathology of nasal cavity and accessory air sinuses: inflammations, tumors.
Pathology of the oral cavity and salivary glands: congenital anomalies, inflammations, premalignant lesions, tumors and tumor like conditions.
Pathology of larynx: inflammations, tumors. Pathology of the mediastunim
13. Lecture:
Organs of special sense.....1 hr
Lesions of eyelid. Conjunctivitis. Intraocular inflammation. Cataracts. Glaucoma. Tumors (orbital, intraocular). Otitis

14. Lecture:
Cardiovascular system .....6 hrs
Blood vessels: Arteries. Atherosclerosis. Hypertensive vascular disease. Aneurysms and dissection. Inflammatory diseases – vasculitides. Veins and lymphatics. Tumors.
Heart: Congestive heart failure. Ischemic heart disease. Hypertensive heart disease. Valvular heart diseases. Primary myocardial diseases. Congenital heart diseases. Pericardial diseases. Cardiac tumors.

*Seminar:***Pathology of the cardiovascular system**
Microscopic slide demonstrations:
Histopathological features of cardiovascular diseases
Myofibrosis cordis (Interstitial myocardial fibrosis)
Myocarditis virosa (Viral myocarditis)
Nephrocirrhosis arterio et arteriolosclerotica (Benign nephrosclerosis)
Atherosclerosis aortae (Aortic atherosclerosis)
Infarctus myocardii (Myocardial infarction)
15. Lecture:
Respiratory system.....6 hrs
Atelectasis. Circulatory disorders. Emphysema. Inflammations: bronchopneumonia, lobar pneumonia, primary atypical pneumonia, lung abscess. Bronchiectasis. Bronchial asthma. Rare forms of pulmonary disease. Tuberculosis. Pneumoconiosis. Lung tumors. Pleural lesions: malignant mesothelioma, pleural effusion and pleuritis, non-inflammatory pleural collections.
*Seminar:***Tumors of the lung and pleura**
Microscopic slide demontrations:
Histopathological features of lung diseases
Pneumonia fibrinosa s. cruposa (Lobar fibrinous/croupous pneumonia – grey hepatization stage)
Bronchopneumonia fibrinoso-purulenta (Lobular pneumonia/Bronchopneumonia)
Bronchopneumonia caseosa tuberculosa (Tuberculous caseous bronchopneumonia)
Tuberculosis miliaris pulmonis (Miliary tuberculosis of the lung)
Membranae hylineae pulmonum (ARDS) (Acute respiratory distress (ARDS)/Diffuse alveolar damage)
Emphysema pulmonum (Pulmonary emphysema)
Small cell carcinoma (Small cell pulmonary carcinoma)
16. Lecture:
Endocrine system and breast… .....4 hrs
Thyroid gland: thyroiditis, Graves disease, goiters, tumors. Parathyroid glands: hyperparathyroidism, hypoparathyroidism. Adrenal cortex: hypofunction of adrenal cortex (hypoadrenalism), hyperfunction of adrenal cortex (hyperadrenalism), tumors. Adrenal medulla: pheochromocytoma, neuroblastoma and ganglioneuroma. Tumors of extra adrenal paraganglia. Multiple endocrine neoplasia syndromes. The endocrine pancreas: Diabetes mellitus, islet cell tumors. Thymus: thymic agenesis and hypoplasia, thymic hyperplasia, tumors.
Female breast:breast inflammations, fibrocystic changes – fibrocystic disease, tumors.
Male breast: gynecomastia, carcinoma.
*Seminar:***Breast cancer, Pathology of diabetes mellitus**
Microscopic slide demonstrations:
Histopathological features of endocrine glands and breast diseases
Struma colloides glandulae thyreoideae (Nodular goiter)
Hashimoto thyreoiditis (struma lymphomatosa) (Hashimoto thyreoiditis)
Carcinoma papillare glandulae thyreoideae (Papillary carcinoma of the thyroid gland)
Carcinoma medullare glandulae thyreoideae (Medullary carcinoma of the thyroid gland)
Pheochromocytoma
Fibrocystic changes of the breast
Fibroadenoma mammae (Fibroadenoma)
Carcinoma mammae ductale invasivum (Ductal invasive carcinoma of the breast)
17. Lecture:
Skin..... 3 hrs
Dermatologic glossary and classification of skin diseases. Inflammatory dermatoses. Benign epithelial tumors. Preinvasive skin lesions (actinic keratosis, Bowen’s disease). Malignant

epithelial skin tumors (squamous and basal cell carcinoma). Benign and malignant melanocytic tumors.
*Seminar:***Histopathological protocol for surgical skin specimens**
Microscopic slide demonstrations:
Histopathological features of skin lesions
Naevus naevocellularis (Common melanocytic nevus)
Keratosis seborrhoica (Seborrheic keratosis)
Dermatofibroma
Haemangioma cutis (Haemangioma of the skin)
Melanoma malignum (Malignant melanoma)
Carcinoma planocellulare cutis (Squamous cell carcinoma of the skin)
Carcinoma basocellulare cutis (Basal cell carcinoma of the skin)
18. Lecture:
Gastrointestinal tract ..... 5 hrs
Esophageal pathology: congenital anomalies, lesions associated with motor dysfunction, inflammations, tumors. Gastric pathology: congenital anomalies, inflammations, gastric ulcers, pathology of mucosal hypertrophy, precancerous lesions, tumors. Small intestine: congenital anomalies, malabsorption syndromes, inflammations, ischemic enteritis, Crohn disease, obstructive lesions, tumors. Colon and anal canal: congenital anomalies, diverticular disease, inflammations, ishemic colitis, idiopathic ulcerative colitis, tumors, polyps and polyposis syndromes. Appendix: inflammations, tumors.
Seminar: Pathology of the pancreas, neuroendocrine system, peritoneum and retroperitoneum
Microscopic slide demonstrations:
Histopathological features of gastrointestinal diseases
Adenoma pleomorphe (Pleomorphic adenoma of the salivary gland)
Gastritis chronica (Chronic gastritis)
Adenocarcinoma ventriculi (Gastric adenocarcinoma)
Ulcus ventriculi chronicum (Gastric peptic ulcer)
Colitis ulcerosa chronica (Chronic ulcerative colitis)
Adenocarcinoma intestini coli (Adenocarcinoma of the colon)
Carcinoma pancreatis (Pancreatic carcinoma)

VI semester: 30 hrs
19. Lecture:
Liver and the biliary tract…..... 4 hrs
Morphologic patterns of hepatic injury. Cirrhosis. Jaundice and cholestasis. Hepatic failure. Inflammatory disorders. Viral hepatitis. Chronic hepatitis. Fulminant hepatitis. Liver abscesses. Drug induced and toxin induced liver disease. Alcoholic liver disease.
Inborn errors of metabolism and pediatric liver disease. Intrahepatic billiary tract disease. Circulatory disorders. Hepatic diseases associated with pregnancy. Transplantation of the liver. Tumors and tumor like conditions. Cholelithiasis (gallstones) Cholecystitis. Disorders of the extrahepatic bile ducts. Tumors.
Seminar: **General pathology of liver diseases**
Microscopic slide demonstrations:
Histopathological features of liver diseases
Cholestasis (Cholestasis)
Adenocarcinoma ventriculi metastaticum in hepate (Metastatic gastric adenocarcinoma to the liver)
Hepatitis virosa (Acute viral hepatitis)
Cirrhosis hepatis (Hepatic cirrhosis)
Carcinoma hepatis hepatocellulare (Hepatocellular carcinoma)

20. Lecture:

Central nervous system .....6 hrs

Basic cellular and tissue reactions to injury. Edema, herniation and hydrocephalus. Vascular diseases (ischemic and hemorrhagic stroke). Infections (epidural, subdural, leptomeningeal and parenchymal). Prion diseases. Demyelinating diseases. Degenerative diseases. Trauma. Perinatal brain injury. Inborn error of metabolism. Aquired metabolic, nutritional and toxic disturbances. Congenital malformations. Pathology of pituitary gland and hypothalamus. (Neoplasms of CNS)Diseases of PNS and skeletal muscle:Basic pathological processes of the peripheral nerves. Inflammatory, metabolic, toxic and hereditary neuropathies. Basic pathological processes of skeletal muscle. Pathology of neuromuscular diseases.

*Seminar:***Tumors of the central nervous system**

Microscopic slide demonstrations:

Histopathological features of CNS diseases

Haemorrhagia cerebri hypertensiva (Hypertensive cerebral hemorrhage)
Infarctus cerebri (Cerebral infarction)
Leptomeningitis purulenta (Purulent leptomeningitis)
Leptomeningitis tuberculosa (Tuberculous leptomeningitis)
Encephalitis virosa (Viral encephalitis)
Meningioma
Glioblastoma multiforme

21. Lecture:

Kidney and lower urinary tract..... 6 hrs

Congenital anomalies. Glomerular diseases: Acute glomerulonephritis: Crescent rapidly progressive glomerulonephritis. Nephrotic syndrome: Membranous glomerulonephritis. Minimal change disease (lipoid nephrosis). Focal segmental glomerulosclerosis. Membranoproliferative glomerulonephritis. IgA nephropathy (Berger's disease). Focal proliferative glomerulonephritis. Chronic glomerulonephritis. Glomerular lesions associated with systemic disease. Diseases of tubules: acute tubular necrosis and acute renal failure. Tubulointerstitial diseases. Pyelonephritis and urinary tract infection. Tubulointerstitial nephritis induced by drugs and toxins. Tubulointerstitial lesions caused by neoplastic diseases. Balcanic nephropathy. Diseases of the blood vessels: Benign nephrosclerosis. Malignant nephrosclerosis. Thrombotic microangiopathies. Renal infarction. Urolithiasis. Tumors. Inflammations and tumors of ureters, urinary bladder and urethra. Hydronephrosis

Seminar: **Selected topics in Nephropathology and urinary tract**

Microscopic slide demonstrations:

Histopathological features of renal diseases

Pyelonephritis purulenta (Purulent pyelonephritis)
Glomerulocapilaris endocapilaris s. acuta (Acute poststreptococcal proliferative glomerulonephritis)
Nephropathia diabetica (Diabetic nephropathy)
Carcinoma transitiocellulare (urotheliale) papillare (Papillary transitional cell (urothelial) carcinoma of the bladder)
Carcinoma lucidocellulare renis (Renal cell carcinoma)
Wilms tumor

22. Lecture:

Female and male genital system .....6 hrs

Vulva: Congenital anomalies, inflammations, tumors. Vagina: Congenital anomalies, inflammations, tumors. Cervix: inflammations, erosio cervicis, cervical intraepithelial neoplasia – CIN, tumors. Uterine corpus: congenital anomalies, inflammations, adenomyosis and endometriosis, endometrial hyperplasia, tumors. Fallopian tubes: inflammations, tumors. Ovaries: inflammations, non-neoplastic cysts, tumors.
Pathology of pregnancy: ectopic pregnancy, gestational trophoblastic disease, hydatidifrom

mole, choriocarcinoma.
Penis: congenital anomalies, inflammations, tumors. Scrotum:tumors. Testis: congenital anomalies, inflammations, hydrocele, haematocele, varicocele, tumors. Epididymis: inflammations, nodular hyperplasia, tumors.

*Seminar:***Selected topic inPathology of the genital system**
Microscopic slide demonstrations:
Histopathological features of male and female genital tract diseases
Epididymitis purulenta subacuta (Subacute purulent epididymitis)
Seminoma testis (Seminoma of the testis)
Hyperplasia nodularis prostatae (Benign prostatic hyperplasia)
Graviditas tubaria (Ectopic pregnancy of the Fallopian tube)
Hyperplasia endometrii simplex nonatypica (Simple endometrial hyperplasia without atypia)
Adenocarcinoma endometrii (Endometrial adenocarcinoma)
Cystadenoma ovarii serosum (Serous ovarian cystadenoma)
Mola hydatidosa (Hydatiform mole)
Cystadenoma ovarii mucinosum (Mucinous ovarian cystadenoma)
Teratoma maturum (Mature teratoma)
23. Lecture:
Hematopoietic and lymphoid system.....5 hrs
Classification of anemia (metabolic and hemolytic). Primary insufficiency of the bone marrow (aplastic anemia, acute agranulocytosis). Myelodysplastic syndromes. Leukemia: acute and chronic. Myeloproliferative diseases. Systemic lymphoproliferative diseases. Hodgkin's disease. Non Hodgkin's lymphomas. Lymphadenitis. Splenomegaly
*Seminar:***Pathology of the Hodgkin and non-Hodgkin lymphomas**
Microscopic slide demonstrations:
Histopathological features of hematopoietic diseases
Hyperplasia follicularis lymphonodi (Follicular hyperplasia of the lymph node)
Hodgkin lymphoma
Small lymphocyte lymphoma
Diffuse large B-cell lymphoma
Burkitt lymphoma

Colloquia
Three colloquia will be organized during the school year. It is not compulsory to pass a colloquium in order to enter the final exam. Each colloquium consists of 20 questions. Each question offers five different answers, and only one answer is correct. Students will get the number of points based on the number of correct answers (there is no passing/failing the colloquium). Only students who didn’t attend colloquium the first time and present with a valid doctor’s note will be eligible for taking the colloquium repeat.

COURSE STRUCTURE

The course includes **90 hours of lectures** and **135 hours of practical exercises**.
Students will have active participation in three forms of practical exercises: autopsy procedures, histopathological examination of tissue slides and slide seminars.

- **The autopsy** provides the students with gross examination of diseased organs and different morphological lesions in order to find relationships between the disease andthe causes of death. The anatomo-clinical confrontation is the model for determination of major disease and cause of death.
- **Histopathological examination** of different tissue slides using light microscopy will be performed by students (after introduction lecture), in order to recognize the main morphological lesions.
- **Slide seminars with PowerPoint presentations** will be performed covering the main topics of all sections of pathology.

PRACTICAL EXERCISES: 135 hrs (+8 hrs slide review)
Seminar: 60 hrs
Microscopic slide demonstrations: 60 hrs (+8 hrs slide review)
Autopsies: 15 hrs = 3 autopsies/school year
Total: 135 hrs (+ 8 hrs slide review)
The autopsy consists of 4 classes + 1class of PowerPoint presentation of autopsy gross findings, histology and final diagnoses (total: 5 classes per autopsy). **All autopsies are obligatory to gain the Signature for the VI semester.**

Total number of classes: 225 hrs (+ 8 hrs slide review):
90 hrs – Lectures
60 hrs – Seminars
60 hrs – Microscopy (+ 8 hrs slide review)
15 hrs – Autopsy

PATHOLOGY FINAL MARK

FINAL MARK: Final exam score = 100 pts (points)

PREEXAM ACTIVITIES: max 30 pts + FINAL EXAM: max 70 pts = 100 pts of Final exam score

PREEXAM ACTIVITIES: **max 30 pts:**

1. Colloquia: **max 20 pts**.

2. **I:** Attendance to the lectures and exercises: **max 6 pts** + **II**: activities during practicals: **max 4 pts = max 10 pts**

I: Attendance to the lectures: **max 2 pts**

1 pt = 51-75%

2 pts = 76-100%

Attendance to the exercises: **max 4 pts** for regular attendance to ALL (not missed any) seminars and microscopy exercises per both semesters: **1 pt** per practical per semester

II: Acitivities during seminars and microscopy gain **max 4 pts** during the whole school year

FINAL EXAM: gains **max 70 pts:**

1. Practical exam: **max 20 pts:**

<3 slides = 0 pts

3 slides = 12 pts

4 slides = 16 pts

5 slides = 20 pts

2. Final test**: max 50 pts** (Final test score: max 100 test pts; <51 test pts = failed = 0 pts)

Final exam score: maximum 100 pts

The final mark is calculated with formula and gained as follows:

Points	Final mark
51 – 60	6
61 – 70	7
71 – 80	8
81 – 90	9
91 – 10	10

LITERATURE

1. Kumar V, Abbas AK, Aster JC.Robbins Basic Pathology. 10th ed. Saunders, Philadelphia; 2017.

2. Klatt EC. Robbins and Cotran Atlas of Pathology. Saunders Elsevier, Philadelphia; 2007.

3. Lecture handouts

Ancillary:

1. Kumar, Abbas, Aster. Robbins & Cotran Pathologic Basis of Disease , 10th ed, 2020

2. Mitchell, Kumar, Fausto, Abbas, Aster. Pocket Companion to Robbins & Cotran Pathologic Basis of Disease, International Edition, 8th ed, 2011

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