

## **OBJECTIVE OF THE PATHOLOGY COURSE**

The aim of the course Pathology is to provide the student with knowledge about the mechanisms of damage, cells, tissues and organs and to acquaint him with the morphological changes that underlie diseases. The task of teaching is to enable students to recognize morphological changes in cells, tissues and organs by acquiring theoretical knowledge in lectures and seminars, and gaining their own experience in clinical autopsies, microscopy and analysis of macroscopic preparations during practices.

The acquired knowledge and skills should enable a better understanding of the causes and mechanisms of the disease, and facilitate the overcoming of the functional consequences of morphological changes.

## **SCHEDULE**

LECTURES	70 hours
SEMINARS	70 hours
PRACTICES	70 hours
TOTAL	210 hours

## **LITERATURE**

- Kumar V, Abbas A, Aster J: Robbins Basic Pathology, 10<sup>th</sup> edition, Elsevier, 2017.
- Power point presentations used during lecturers and seminars.
- The Internet Pathology Laboratory for Medical Education courtesy of Prof. Edward C. Klatt, MD, Mercer University School of Medicine available on <https://webpath.med.utah.edu/>.

## **EXAMS**

Students knowledge will be tested in a written form.

There will be two mandatory partial exams (P1 and P2) and one mandatory final exam.

The first partial exam (P1) includes general pathology, cardiovascular system, the respiratory system, the hematopoietic and lymphoid system and the skin.

The second partial exam (P2) includes the rest of the systemic pathology.

Each partial exam test has 100 questions, and only one is correct.

The students need to correctly answer at least 60% of questions to pass the partial exams.

Each exam will contribute equally to total grade.

Results from partial exams, taken during the course are valid only till the end of the respective academic year.

An example on how final grade is calculated is given here as follows:

Category		
Partial test 1	Excellent (5)	
Partial test 2	Very good (4)	
Final exam	Excellent (5)	

Grades are calculated based on the presented point cuts achieved on each exam:

60-70 points= sufficient (2)

71-80 points= good (3)

81-90 points= very good (4)

91-100 points= excellent (5)

### **CLASS ATTENDANCE**

Class attendance is mandatory (including lectures, seminars and practicals). If students miss a class, they are required to have a colloquium with a teaching assistant. Students who have not met the attendance requirement including the make-up colloquia will not be admitted to partial examinations and final test.

### **EXAM TERMS**

P1: 26. 10. 2024. at 2 PM

P2: 27. 11. 2024. at 2 PM

Final exam including P1 and P2: 30. 11. 2024. at 10 AM

February exam term: 10.02.2025. at 2 PM

July exam terms: 01.07. 2025. at 2 PM

or

15. 07. 2025. at 2 PM

September exam terms: 02. 09. 2025. at 2 PM

16. 09. 2025. at 2PM

**L1, S1 - CELL INJURY, CELL DEATH, AND ADAPTATIONS I:** Overview of cellular responses to stress and noxious stimuli, Causes of cell injury, Sequence of events in injury and cell death (page 31-41).

**L2, S2 - CELL INJURY, CELL DEATH, AND ADAPTATIONS: II:** Mechanisms of cell injury and cell deaths, Cellular adaptations to stress, Intracellular accumulations, Pathologic calcification, Cellular aging (page 41-56).

**L3, S3 – INFLAMMATION AND REPAIR I:** Overview of inflammation, definitions and general features, Causes of inflammation, Recognitions of microbes and damaged cells, Acute inflammation, Mediators of inflammation (page 57-77).

**L4, S4 – INFLAMMATION AND REPAIR II:** Morphologic patterns of acute inflammation, Outcomes of acute inflammation, Chronic inflammation, Systemic effects of inflammation, Tissue repair (page 78-95).

**L5, S5- HEMODYNAMIC DISORDERS, THROMBOEMBOLISM AND SHOCK**  
Hyperemia and congestion; Edema; Haemorrhage, Hemostasis and thrombosis: Thrombosis, Embolism, Infarction, Shock (page 97-101; 106-119).

**L6, S6 – DISEASES OF THE IMMUNE SYSTEM I:** The normal immune response, Cells and tissues of the immune system, Overview of lymphocyte activation and adaptive immune responses, Hypersensitivity: Immunologically mediated tissue injury (page 121-145), Rejection of transplants (162-168).

**L7, S7 – DISEASES OF THE IMMUNE SYSTEM II:** Autoimmune diseases, Immunodeficiency syndromes, Acquired immunodeficiency syndrome, Amyloidosis (page 145-162; 168-187).

**L8, S8 - NEOPLASIA I:** Nomenclature, Characteristics of benign and malignant neoplasms, Epidemiology, Cancer genes, Genetic lesions in cancer, Carcinogenesis: a multistep process (189-204).

**L9, S9 - NEOPLASIA II:** Hallmarks of cancer: Self-sufficiency in growth signals (p.205); Insensitivity to growth inhibitor signals: tumor suppressor genes (p. 208-213), Sustained angiogenesis (p.219-228); Clinical aspects of neoplasia (page 235-242).

**L10, S10 - GENETIC AND PEDIATRIC DISEASES:** Marfan syndrome, Ehlers-Danlos syndrome (p. 247-248); Familial Hypercholesterolemia (p.248-250), Cystic fibrosis (p.250-254); Phenylketonuria (p.254-255); Complex multigenic disorders (p.261-262); Trisomy 21 (p.264-266), Klinefelter syndrome (p.267), Turner syndrome (p. 267-269); Triplet repeat mutations: Fragile x syndrome (p.269-270); Congenital anomalies (p.273-277); Perinatal

infections, prematurity and fetal growth restrictions, RDS, Necrotizing enterocolitis, SIDS, Fetal hydrops, Tumors and tumor like lesions of infancy and childhood (p.273-291).

**L11, S11 – BLOOD VESSELS:** Structure and function of blood vessels, Congenital anomalies, Hypertensive vascular disease, Vascular wall response to injury, Arteriosclerosis, Atherosclerosis, Aneurysms and dissections, Vasculitis, Disorders of blood vessels hyper reactivity, Veins and lymphatics, Tumors (page 361-364, 366-391).

**L12, S12 – HEART I:** Heart failure, Congenital heart diseases, Ischemic heart diseases, Arrhythmias (400-420).

**L13, S13 - HEART II:** Hypertensive heart disease, Valvular heart disease, Cardiomyopathies and myocarditis, Pericardial disease, Cardiac tumors (page 420-439).

**L14, S14 - LUNG I:** Atelectasis (Collapse); ARDS; Obstructive vs Restrictive pulmonary diseases; Obstructive lung (airway) diseases; Chronic interstitial (Restrictive infiltrative) lung diseases; Pulmonary diseases of vascular origin (page 495-519).

**L15, S15 - LUNG II:** Pulmonary infections; Lung tumors; Pleural lesions; Lesions of the upper respiratory tract (519-548).

**L16, S16 - THE HEMATOPOIETIC AND LYMPHOID SYSTEM I:** Red cell disorder; Bleeding disorders; Complication of transfusion; Disorders of the spleen and thymus (page 442-459; 485-494).

**L17, S17 - THE HEMATOPOIETIC AND LYMPHOID SYSTEM II:** White cell disorders (page 459-485).

**L18, S18 – THE SKIN:** Acute Inflammatory dermatoses; Chronic Inflammatory dermatoses; Infectious dermatoses; Blistering (Bullous) disorders; Tumors of the skin (page 889-908).

**L19, S19 – ORAL CAVITIES AND GI TRACT I:** Oral cavity (page 583-590), Esophagus (page 590-598), Stomach (page 598-607).

**L20, S20- ORAL CAVITIES AND GI TRACT II:** Small and large intestine (page 607-634), Appendix (634-636).

**L21, S21 – THE LIVER AND BILIARY SYSTEM I:** General features of liver diseases, Infectious disorders, Autoimmune hepatitis, Drug and toxin induced liver injury, Alcoholic and non-alcoholic fatty liver disease, Inherited metabolic liver diseases (page 637-659).

**L22, S22 – THE LIVER AND BILIARY SYSTEM II:** Cholestasis syndromes; Circulatory disorders; Nodules and tumors; Gallstone diseases; Cholecystitis; Carcinoma of the gallbladder (page 659-677).

**L23, S23 – THE PANCREAS:** Congenital anomalies; Pancreatitis; Pancreatic neoplasms (page 679-689).

**L24, S24 – KIDNEYS AND ITS COLLECTING SYSTEM I:** Clinical manifestations of renal diseases; Glomerular diseases (page 549-564).

**L25, S25 - KIDNEYS AND ITS COLLECTING SYSTEM II:** Diseases affecting tubules and interstitium; Diseases involving blood vessels; Chronic kidney diseases; Cystic diseases of the kidney; Urinary outflow obstruction; Congenital and developmental anomalies; Neoplasms (page 564-581).

**L26, S26 – BONES AND JOINTS I:** Basic structure and function of the bone; Congenital disorders of Bone; Metabolic disorders of Bone; Paget disease of bone; Fractures; Osteonecrosis; Osteomyelitis; Bone tumors and tumor like lesions (page 797-817).

**L27, S27 – BONES AND JOINTS II:** Joints (page 817-827); Soft tissue tumors (page 827-833) + selected topics from **PERIPHERAL NERVES AND MUSCLES** (Peripheral nerve sheath tumors: Schwannomas and Neurofibromatosis Type 2, Neurofibromatosis Type I, Malignant peripheral nerve sheath tumors page 846-847).

**L28, S28- THE BREAST:** Clinical presentations of breast disease; Inflammatory processes; Stromal neoplasms; Benign epithelial lesions; Carcinoma (page 736-747).

**L29, S29 – THE MALE GENITAL SYSTEM AND LOWER URINARY TRACT:** Penis; Scrotum, testis and epididymis; Prostate; Ureter, Bladder and Urethra; Sexually transmitted diseases (page 691-712).

**L30, S30 – THE FEMALE REPRODUCTIVE SYSTEM I:** Vulva; Vagina; Cervix; Uterus (page 713-726).

**L31, S31 – THE FEMALE REPRODUCTIVE SYSTEM II:** Fallopian tubes; Ovaries; Diseases of pregnancy (page 726-736).

**L32, S32- THE ENDOCRINE SYSTEM I:** Thyroid (page 755-769); Parathyroid glands (page 769-772).

**L33, S33 - THE ENDOCRINE SYSTEM II:** Pituitary (page 750-755); Endocrine pancreas (page 772-784); Adrenal cortex; Adrenal medulla; Multiple Endocrine Neoplasia Syndromes (page 784-795).

**L34, S34 – THE NERVOUS SYSTEM I:** Edema; Herniation and hydrocephalus; Cerebrovascular diseases; Central nervous system trauma; Congenital malformation and perinatal brain injury; Infections of the Nervous system (page 850-870).

**L35, S35 - THE NERVOUS SYSTEM II:** Genetic metabolic diseases; Acquired metabolic and toxic disturbances; Neurodegenerative diseases; Tumors (page 870-888).