REQUIREMENTS

Semmelweis University, Faculty of General Medicine – single, long-cycle medical training programme
Name of the host institution (and any contributing institutions):

Department of Pathology and Experimental Cancer Research

Name of the subject: Pathology I.

in English: Pathology I.

in German:

Credit value: 7

Semester: 1
(as defined in the curriculum)

Total number of classes per week: 7	**lectures: 3**	**practical lessons: 4**	**seminars: 0**

Type of subject: **compulsory** optional elective
(PLEASE UNDERLINE AS APPLICABLE)

Academic year: 2023/2024. I.

Language of instruction, for optional or elective subjects: english

Course code: AOKPTK023_1A
(In the case of a new subject, this cell is filled in by the Dean's Office, following approval)

Course coordinator: Dr. András Matolcsy

Place of work, phone number: Department of Pathology and Experimental Cancer Research, 06-1-317-1074

Position: director

Date and number of habilitation: 118-6/1997

Objectives of the course and its place in the medical curriculum:
The aim of teaching the pathology subject is to familiarize the students with pathological changes and the pathomechanism of diseases. In the course of the training, students get to know the examination methods and diagnostic procedures of pathology and gain insight into clinicopathological thinking. The training takes place in the form of classroom lectures, histological, dissection and organ demonstration exercises.

Place of instruction (address of lecture hall or seminar room etc.):
Department of Pathology and Experimental Cancer Research

Competencies acquired through the completion of the course:
Knowledge of the development and course of diseases, knowledge of the nomenclature of diseases, recognition and knowledge of basic histopathological and macroscopic changes, knowledge of clinicopathological correlations.

Prerequisites for course registration and completion:
Macroscopic anatomy and development I-II, Microscopic anatomy and development I-II, Medical physiology, Medical biochemistry II.

Conditions for concurrent course registration and permission thereof in the case of a multi-semester subject: CV course: it is possible in specially justified cases, with the director's approval

Student headcount conditions for starting the course (minimum, maximum) and method of student selection: maximum 135 students, groups EM 10,11,12,14,15,16,17,18,19

Detailed course description:

(Theoretical and practical instruction must be broken down into lessons (weeks), numbered separately. Please provide the names of lecturers in both types of lessons, indicating guest lecturers. This information is not to be attached separately. CVs of guest lecturers, however, must be attached.)

Introduction, Signs of Death, Morphology of Cell and Tissue Injury, Degenerations

1. Matolcsy The place and role of Pathology in the Medicine. Structure of pathology and methods
2. Matolcsy Definition of Death, Signs of Death, Necrosis and Apoptosis.
3. Matolcsy Examples of Necrosis. Myocardial Infarction.
4. Kiss Reversible Cell Injury

Growth disturbances, Abnormal Accumulation, Pigments, Pathologic Calcification.

5. Matolcsy Lipid accumulation, Atherosclerosis, Protein accumulation, Amyloidosis.
6. Matolcsy Cellular adaptations: Hypertrophy, Hyperplasia, Atrophy, Metaplasia
7. Matolcsy Endogeneous and Exogeneous Pigments, Calcification, Lithiasis

Hemodynamic Disorders, Thrombosis, and Shock

8. Matolcsy Hemorrhage
9. Matolcsy Thrombosis, Embolism, DIC
10. Zalatnai Stagnation, oedema, shock

Inflammation

11. Scheich Acute inflammation and sepsis
12. Dezső Chronic Inflammation and Tissue Repair: Regeneration, Healing, and Fibrosis

Diseases of the Immune System

13. Matolcsy Mechanisms of Immune-Mediated Injury
14. Matolcsy Immune deficency Diseases. Rejection of Transplants
15. Matolcsy Autoimmune Disease

Genetic Disease

16. Bödör Molecular pathology technics in the daily medical practice
17. Bödör Genetic alterations and its clinical manifestations

Neoplasia

18. Matolcsy Characteristics of Benign and Malignant Neoplasms
19. Matolcsy Carcinogenesis, Etiology of Neoplasia
20. Bödör Prevention, Diagnosis and targeted treatment of Cancer
21. Matolcsy Ability to Invade and Metastasize
22. Matolcsy Preneoplastic Disorders

Pediatric Diseases

23. Kiss Congenital and prenatal diseases. Childhood Tumors

Diseases of the heart and the cardiovascular system

24. Matolcsy Anomalies of cardiac development, ISZB
25. Matolcsy Diseases of endocardium, myocardium, pericardium
26. Fintha Vascular pathology

Environmental and Nutritional Diseases

27. Rácz Effects of tobacco. Injury by Drugs and Drugs of Abuse. Effect of alcohol. Obesity

Practical topics:

1. week Introduction
2. week Necrosis I.
3. week Necrosis II.
4. week Adaptation, degeneration
5. week Adaptation, calcification, stone formation
6. week Circulation I.
7. week Circulation II.
8. week Acute inflammation
9.week Chronic inflammation
10. week Immunology
11. week Oncology I.

12. week Oncology II.
13. Cardiology
14. Consultation

Practical instructors:
1.Dr. Judit Pápay
2. Dr. Ildikó Krencz
3. Dr. Attila Fintha
4. Dr. Anna Jakab
5. Dr. Réka Mózes
6. Dr. Ágnes Nagy
7. Dr. Ágota Szepesi
8. Dr. Ivett Teleki
9. Dr. Péter Nagy
10. Dr. Gertrud Forika
11. Dr. Márton Sághi
12. Dr. Judit Csomor
13. Dr. Noémi Jákob
14. Dr. Balázs Csernus
15. Dr. Katalin Pálos
16. Dr. Alex Jenei
17. Dr. Árpád Szállási
18. Dr. Attila Zalatnai
19. Dr. Zoltán Lippai
20. Dr. Tamás Székely
21. Dr. Ambrus Gángó
22. Dr. Richárd Kiss
23. Dr. László Fónyad
24. Dr. Bence Ferenc
25. Dr. Gergely Rácz

Related subjects due to interdisciplinary fields (both compulsory and elective) and potential overlaps between subjects:
Overlap with almost all chapters of the Translation Medicine -Pathophysiology subject, except ECG.

Attendance requirements; conditions under which students can make up for absences and the method of absence justification:
Attendance at at least 75% of the lectures is mandatory (TVSZ. 29§.5), the lectures are part of the material that can be counted in the exams. We keep a random attendance sheet at the lectures. At least 75% attendance and participation in practical sessions is mandatory (TVSZ. 29§.2.a), the practice tutors fill out an attendance form at the beginning of each practice. Over the course of the semester, absences that exceed three practical sessions in the autopsy room, three absences in more than three histology-organ demonstration practical sessions, and one absence in more than one consultation practical session must be made up in the semester. A histology-organ demonstration practice can only be replaced with a practice on the same topic. Autopsy and consultation practice can be replaced at any time, with any group. Absences from more than three autopsy and histology-organ demonstration sessions, as well as one consultation practice session, must be confirmed in writing by the practice tutors or the department registrar.

Form of assessment in the study period:
(including the number, topics and scheduling of oral and written tests, their share in the overall evaluation, make-up tests and improvement tests)

During the semester period, we do not hold mandatory subject partial performance evaluations, there are no oral and written tests and practical marks. During the semesters, the practical tutors are constantly informed about the students' preparedness. In consultation with the students of the group and the demonstrator, the practical tutors can carry out a mid-year competence and subject knowledge level assessment of various forms (oral report, presentation, test, essay, demonstration, homework, project task), however, the result of this is not followed by a practical mark, and the semester is not a condition signature and cannot be taken into account in the results of the semifinal exam.

Number and type of assignments for individual work and the deadline for submission:
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Requirements to obtain the teacher's signature:
At least 75% attendance and participation in practical sessions and lectures. In the course of a semester, you can miss the three autopsy room practices, three histology-organ demonstration practices and one consultation practice without a certificate. The other practices must be replaced, the practical tutor of the replaced practice will provide a certificate. (Histology and organ demonstration practice can only be replaced with the same practice. Autopsy room and consultation practice can be replaced at any time, with any group).

Type of assessment: *(comprehensive examination, end-term examination, term-grade, term-grade on a three-grade rating scale, coursework project, no examination)*

end-term (semifinal) examination

Examination requirements:
(*list of examination topics, subject areas of tests / examinations, lists of mandatory parameters, figures, concepts and calculations, practical skills and the optional topics for exam-equivalent coursework projects, their criteria of completion and assessment)*

GENERAL PATHOLOGY TOPICS „A"

NECROSIS, APOPTOSIS
A/01. Causes, morphology and mechanism of necrosis
A/02. Reperfusion injury
A/03. Mechanisms of apoptosis and its pathological characteristics
A/04. Coagulative necrosis and its organ manifestations
A/05. Colliquative necrosis and its organ manifestations
A/06. Hemorrhagic infarction and its organ manifestations
A/07. Fat, caseous and fibrinoid necrosis and their organ manifestations
A/08. Acute myocardial infarction
A/09. Cerebral infarction

REVERSIBILE CELL INJURY, PATHOLOGIC ACCUMLATION, PIGMENTS, CALCIFICATION
A/10. Reversible cell injury, types of degeneration and their organ manifestations
A/11. Types of fatty degeneration and its organ manifestation
A/12. Atherosclerosis
A/13. Amyloidosis
A/14. Cystic fibrosis
A/15. Hyaline accumulation and its organ manifestations
A/16. Anthracosis, lipofuscin, hemosiderin and melanin accumulation
A/17. Dystrophic calcification and its organ manifestations
A/18. Metastatic calcification and its organ manifestations
A/19. Stone formation; urinary and biliary stones

CELLULAR ADAPTATION TO STRESS
A/20. Pathomechanisms of atrophy and hypertrophy, examples
A/21. Myocardial hypertrophy and its clinical forms
A/22. Pathomechanisms of hyperplasia, examples
A/23. Pathomechanisms of metaplasia and dysplasia, examples

HEMODYNAMIC DISORDERS, THROMBOSIS, HEMORRHAGE
A/24. Pathomechanism of cardiac failure
A/25. Congestion and its organ manifestation
A/26. Causes and types of shock
A/27. Causes and types of edema

A/28. Causes and types of thrombosis
A/29. DIC
A/30. Types of emboli
A/31. Types of hemorrhages and their clinical presentations
A/32. Intracranial hemorrhages

INFLAMMATION
A/33. Characteristics of acute inflammation (cellular events, chemical mediators, systemic effects, stratification according to exudate, examples)
A/34. Pathomechanism and types of chronic inflammation, examples

DISEASES OF THE IMMUNE SYSTEM
A/35. Type I., Type II. hypersensitivity reactions and diseases mediated by these mechanisms
A/36. Type III., Type IV. hypersensitivity reactions and diseases mediated by these mechanisms
A/37. Rejection of transplants
A/38. Pathomechanisms of autoimmume diseases
A/39. Systemic lupus erythematosus, heumatoid arthritis
A/40. Sjögren syndrome, Systemic sclerosis, Polyarteritis nodosa
A/41. Inherited and acquired immunodeficiencies
A/42. AIDS

GENETIC DISEASES
A/43. Diagnostics of genetic disorders
A/44. Autosomal dominant disorders
A/45. Familial hypercholesterinemia
A/46. Autosomal recessive and X-linked inheritance disorders
A/47. Cytogenetic disorders caused by chromosomal aberrations
A/48. Single-gene disorders with atypical patterns of inheritance

PEDIATRIC DISEASES
A/49. Pathogenesis of congenital anomalies
A/50. Disorders associated with prematurity (IRDS, NEC, Sudden Infant Death)
A/51. Fetal hydrops

ENVIRONMENTAL DISEASES
A/52. Pathology of smoking-related disorders
A/53. Pathology of alcohol-related disorders
A/54. Pathomechanism of obesity and its consequences; examples

ONCOLOGY AND CARDIOLOGY TOPICS „B”

NEOPLASIA
B/01. General characteristics of neoplasms (benign, malignant tumors)
B/02. Classification of neoplasms on basis of histology
B/03. Characteristics of neoplasms, growth rate
B/04. Invasion and metastasis of neoplasms
B/05. Promotion mechanisms of oncogenes and their roles in carcinogenesis
B/06. Inhibitory mechanisms of tumor suppressor genes their and roles in carcinogenesis
B/07. EGFR, ABL and BCL2 genes and their roles in tumor development
B/08. RB, p53 and APC genes and their roles in tumor development
B/09. BRCA1, BRCA2 and ATM genes and their roles in tumor development
B/10. DNA repair genes and their roles in carcinogenesis

B/11. Cytogenetic aberrations and the role of telomeres in carcinogenesis
B/12. Epigenectic changes (DNA methylaton, microRNAs) and their roles in carcinogenesis
B/13. Inherited cancer syndromes (autosomal dominant, recessive and familiar)
B/14. Viral and microbial oncogenesis
B/15. Chemical and radiation carcinogenesis
B/16. Tumor antigenes
B/17. Tumor immunity and immune surveillance
B/18. Epidemiology of neoplasms
B/19. Characteristics and morphology of preneoplastic disorders
B/20. Grading and staging of cancer
B/21. Effects of tumor on host (cancer cachexia, paraneoplastic syndromes)
B/22. Tumors of childhood and their characteristics (neuroblastoma, retinoblastoma, Wilms tumor)
B/23. Pathological, genetic, immunological and molecular diagnostics of tumors
B/24. Tumor therapy (surgical, radiation, chemo, target molecular and immunotherapy)

PATHOLOGY OF CARDIOVASCULAR SYSTEM
B/25. Left-sided heart failure
B/26. Right-sided heart failure
B/27. Congenital heart diseases
B/28. Myocardial infarction, sudden cardiac death
B/29. Angina pectoris, chronic ischemic heart disease
B/30. Hypertensive heart disease
B/31. Rheumatic fever and rheumatic myocarditis
B/32. Degenerative valvular heart diseases (calcific aorta stenosis, mitral prolapse)
B/33. Infective endocarditis (acute and subacute)
B/34. Noninfective endocarditis (thrombotic endocarditis, Libman-Sacks endocarditis)
B/35. Valvular dysfunctions and their consequences
B/36. Myocarditis and cardiomyopathies
B/37. Cor pulmonale
B/38. Arteriolosclerosis
B/39. Aneurysms and aortic dissection
B/40. Arteritis and phlebitis
B/41. Varices, varicosities and disorders of the lymphatic vessels
B/42. Cardiac and vascular tumors

Practical exam: Recognition and demonstration of one slide and one macropreparation presented in the histological practice.
Autopsy exam: none during the end-term examination.
Theoretical exam: Description of a General pathology (A), an Oncology and Cardiology (B) topics.

Method and type of grading:
(*Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results of the end-of-term assessment. Possibilities of and conditions for offered grades.)*

The colloquium is a combined exam consisting of a combination of practical (performance of practical tasks) and theoretical (oral performance evaluation) exam tasks, both are oral exams. The practical exam consists of a demonstration of a digital histological slid and a preserved macropreparation. The student receives a separate mark for each practical exam section. An insufficient practical exam partial mark is not a deterrent, i.e. in this case the student can attempt the theoretical exam part. The practical exam is followed by the theoretical part of the exam. It takes place at the theoretical examination boards, the chairpersons of which are appointed by the head of the department. Another member of the committee, usually a resident physician, is appointed by the department registrar. The rigorous oral exam takes place based on the exam topics announced at the beginning of the academic year. The student draws a general pathology topic (topic A), and an

oncology and cardiology themed topic (topic B). The student receives a separate mark for each theoretical exam topics. An insufficient theoretical exam transcript is in itself a disqualification. At the end of the theoretical part, the chairman of the examination board determines the final grade mark based on the practical and oral exam partial marks, which is usually - but not obligatory - the weighted average of the practical and theoretical exam partial marks.
List of course books, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids: Robbins&Kumar: Basic Pathology 10th Edition Medicina, 2019 András Matolcsy: Basic Pathology - A Socratic Approach. Medicine, 2016
Signature of habilitated instructor (course coordinator) announcing the course:
Signature of the director of the host institution:
Date of submission: