

**MEDICAL FACULTY BANJA LUKA**  
**DEPARTMENT OF PATHOLOGY**  
**MEDICINE STUDY PROGRAM**  
**Academic year 2024/2025**

**INFORMATION GUIDE**

**Subject: ANATOMIC PATHOLOGY**

The information guide is intended for regular students of the 3rd year of the Medical Faculty, University Banja Luka – Studies in English.

The guide contains basic information about the subject, notifications regarding the total number of class hours, the organization of theoretical and practical classes, the curriculum, the list of histological preparations, notes on the examination method, exam questions, and a list of primary and supplementary textbooks.

We believe that this type of information will enable students to master the knowledge of the subject more successfully and achieve more success in their studies overall.

**Author of the Guide**

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**Introduction:**

**Anatomic pathology - Pathology:** Pathology is the science that studies diseases. The name is derived from two Ancient Greek words: *pathos*, meaning suffering or disease, and *logos*, meaning word, or in the broader sense, science. In modern medicine, the term pathology has three meanings: (1) As the name for the basic science that deals with the study of diseases; (2) As a medical profession focused on laboratory, predominantly microscopic, diagnosis of diseases; (3) As a preclinical teaching subject, medical education bridges basic subjects like anatomy and physiology with clinical subjects like internal medicine and surgery.

In the 20th century, pathology became a clinical science, inseparable from other clinical specialties such as internal medicine, surgery, or gynecology. Modern pathologists no longer focus only on autopsies but are members of diagnostic teams involved in diagnosing, prescribing treatment, and formulating prognoses. Clinical and epidemiological studies are unimaginable without the

involvement of pathologists. These modern pathologists still observe tissues under microscopes, but the resolving power of these microscopes has multiplied. Pathologists also work in cytopathology, diagnosing based on cell smears, and they apply modern diagnostic methods such as electron microscopy, immunohistochemistry, immunofluorescent microscopy, diffraction microscopy, flow cytometry, cytogenetics, etc. Achievements in molecular biology have enabled the use of molecular genetics methods, leading to the development of molecular pathology.

Pathology studies morphological changes in tissues, organs, or the body. In a narrower sense, this type of pathology is a morphological discipline that includes autopsy pathology, biopsy pathology, and cytopathology. Contemporary morphologists use microscopes like their renowned predecessors. However, they can supplement microscopic findings with additional data obtained through specialized techniques such as histochemistry (biochemical reactions adapted for tissue analysis under the microscope) and immunohistochemistry (immunological reactions adapted for tissue analysis under the microscope). Recently, classical pathological data have been supplemented by molecular biology methods.

## **I. GENERAL NOTES**

Pathology is taught in the fifth and sixth semesters, with 150 hours of theoretical and 90 hours of practical instruction. Theoretical classes are held in the Medical Faculty amphitheatres according to the schedule published by the Faculty's Student Affairs Office at the beginning of the semester. Practical classes are conducted at the Institute of Pathology at the Clinical Center Banja Luka.

Theoretical and practical classes for the subject are taught by:

1. Two full professors
2. One associate professors
3. One assistant professor
4. Two senior reaching assistants
5. One teaching assistant

## **II. THEORETICAL TEACHING PROGRAM**

### **General Pathology**

- Introductory lecture (Pathology and its role in understanding and diagnosing diseases);
- Cell injury, death and adaptations;
- Inflammation and repair;
- Hemodynamic disorders, thromboembolism and shock;
- Immune system diseases;
- Neoplasia;
- Genetic and pediatric diseases;
- Environmental and nutritional diseases;

## **Special Pathology**

- Pathology of blood vessels;
- Pathology of the heart;
- Pathology of the hematopoietic and lymphoid system;
- Pathology of the lung;
- Pathology of the kidney;
- Pathology of the oral cavity and the gastrointestinal tract;
- Pathology of the liver and gallbladder;
- Pathology of the pancreas;
- Pathology of the male genital system and lower urinary tract;
- Pathology of the female genital system and breast;
- Pathology of the endocrine system;
- Pathology of the bones, joints and soft tissue tumours;
- Pathology of the peripheral nerves and muscles;
- Pathology of the central nervous system;
- Pathology of the skin.

**NOTE:** Attendance at theoretical lectures is mandatory, and precise records will be kept. The student will receive a predetermined number of points based on attendance and participation in theoretical teaching, contributing to the final number of points and the final exam grade.

### **III. PROGRAM OF PRACTICAL CLASSES**

Practical teaching in the subject is held at the Institute of Pathology, University Clinical Center Banja Luka:

- 3 hours/week in the winter semester
- 3 hours/week in the summer semester

#### **1. Histological diagnostics**

During the semester, students attend histological and macroscopic diagnostic exercises for three hours per week according to a schedule published as part of the general timetable for students of the Medical Faculty. The exercises take place at the Institute of Pathology, University Clinical Center of Republic Srpska, Banja Luka.

**List of histopathological changes that will be studied during the exercises:**

##### **Exercise No. 1**

###### **1.1. Introductory exercise**

**Exercise No. 2: Cell adaptation**

- 2.1. *Atrophia cyanotica hepatis*
- 2.3. *Hypertrophia myocardii*
- 2.4. *Hyperplasia prostatae*

**Exercise No. 3: Intracellular accumulation / degeneration**

- 3.1. *Degeneratio hydropica et vacuolaris renis*
- 3.3. *Steatosis hepatis (Degeneratio adiposa hepatis)*
- 3.5. *Infiltratio adiposa myocardii*

**Exercise No. 4: Deposition of amyloid, calcium, and urates**

- 4.2. *Amyloidosis lymphonodo (HE + Congo red)*
- 4.3. *Calcificatio metastatica pulmonis*
- 4.4. *Tophi urici*

**Exercise No. 5: Lethal injuries (Necrosis)**

- 5.2. *Infarctus recens (anaemicus) myocardii*
- 5.4. *Infarctus recens (haemorrhagicus) intestini tenui*
- 5.5. *Necrosis haemorrhagica acuta cum steatonecrosi textu adiposi pancreatis*

**Exercise No. 6: Circulation disorders**

- 6.1. *Haemorrhagia recens lienis*
- 6.2. *Ecchymoses cerebri*
- 6.3. *Embolia thrombotica ramorum arteriae pulmonalis*
- 6.4. *Thrombus arteriae in organisatione*

**Exercise No. 7: Regeneration, repair, and pigmentation**

- 7.1. *Granulationes*
- 7.2. *Cicatrix post infarctum myocardii (HE + Van Gieson)*
- 7.3. *Haemosiderosis pulmonis (HE + Perls)*
- 7.4. *Naevus pigmentosus intradermalis*

**Exercise No. 8: Acute inflammation**

- 8.1. *Appendicitis acuta phlegmonosa*
- 8.3. *Abscessus cerebri*
- 8.4. *Leptomeningitis purulenta acuta*
- 8.5. *Myocarditis interstitialis*

**Exercise No. 9: Chronic inflammation**

- 9.1. *Cholecystitis chronica simplex*
- 9.2. *Glomerulonephritis subacuta (glomerulonephritis progressiva rapida)*
- 9.3. *Pyelonephritis chronica*

**Exercise No. 10: Specific inflammation**

- 10.1. *Tuberculosis disseminata pulmonis*
- 10.2. *Lymphadenitis granulomatosa caseosa (tuberculosis)*
- 10.4. *Lymphadenitis granulomatosa (sarcoidosis)*
- 10.6. *Morbus Crohn*

**Exercise No. 11: General pathology of tumours**

- 11.1. *Lipoma*
- 11.3. *Fibroma durum*
- 11.4. *Fibroadenoma mammae pericanalliculare*
- 11.5. *Liposarcoma*

**Exercise No. 12: Pathology of the cardiovascular system**

- 12.1. *Endocarditis thrombotica*
- 12.2. *Atherosclerosis – atheroma*
- 12.3. *Arteriolosclerosis hyalinae renis (nephrosclerosis benigna)*
- 12.5. *Calcificatio mediae arteriarum uteri (sclerosis mediae calcificata Mönckeberg)*

**Exercises No. 13. Pathology of the respiratory system**

- 13.1. *Bronchopneumonia*
- 13.2. *Pneumonia lobaris (hepatizatio grisea)*
- 13.3. *Pneumonia chronica (in cursu organisationis) HE+Van Gieson*
- 13.5. *Membranae hyalinae pulmonis*

**Exercises No. 14. Pathology of the respiratory system**

- 14.1. *Carcinoma microcellulare pulmonis*
- 14.2. *Carcinoma planocellulare (squamocellulare) bronchi*
- 14.4. *Bronchial carcinoid*
- 14.5. *Adenocarcinoma pulmonis*

**Exercise No 15. Pathology of oral cavity and salivary glands**

- 15.1. *Epulis gigantocellularis*
- 15.3. *Laesio lymphoepithelialis glandulae salivaris (Sjögren's syndrome)*
- 15.4. *Tumour mixtus (adenoma pelomorphe) glandulae salivaris*
- 15.5. *Cystadenoma lymphomatosum glandulae salivaris (Warthin's tumour)*

**Exercise No 16. Pathology of the gastrointestinal tract**

- 16.1. *Ulcus chronicum ventriculi*
- 16.4. *Diverticulosis (diverticulitis)*
- 16.5. *Diverticulum Meckeli*

**Exercise No 17. Pathology of the gastrointestinal tract**

- 17.1. *Adenoma tubulare intestini crassi*
- 17.2. *Adenocarcinoma ventriculi - intestinal type*
- 17.3. *Adenocarcinoma ventriculi – diffuse type (HE + diastaza-PAS)*
- 17.4. *Adenocarcinoma intestini crassi*

**Exercise No 18. Pathology of the liver and the pancreas**

- 18.1. *Hepatitis chronica aggressiva cum cholestasi*
- 18.2. *Cirrhosis hepatis*
- 18.4. *Carcinoma hepatocellulare (cirrhosis carcinomatosa hepatis)*
- 18.5. *Adenocarcinoma intestini crassi metastaticum in hepate*

**Exercise No 19. Pathology of the endocrine system**

- 19.1. *Struma lymphomatosa Hashimoto*

- 19.2. *Adenoma folliculare glandulae thyreoideae*
- 19.3. *Carcinoma papillare glandulae thyreoideae*
- 19.5. *Adenoma corticis glandulae suprarenalis*

**Exercise No 20. Pathology of the breast**

- 20.1. *Dysplasia mammae (fibrocystic mammary changes)*
- 20.2. *Fibroadenoma mammae*
- 20.3. *Carcinoma ductale invasivum mammae. Lymphangiosis carcinomatosa*
- 20.4. *Carcinoma lobulare invasivum mammae*

**Exercise No 21. Pathology of the kidney, lower urinary tract and male genital system**

- 21.1. *Carcinoma renis (clear cell type)*
- 21.2. *Nephroblastoma (Wilms-ov tumour)*
- 21.3. *Carcinoma transitiocellulare papillare vesicae urinariae invasivum*
- 21.4. *Adenocarcinoma prostatae*
- 21.5. *Seminoma testis*

**Exercise No 22. Pathology of the female genital system**

- 22.1. *Polypus cervicis uteri*
- 22.3. *Endometriosis tubae uterinae*
- 22.5. *Mola hydatidosa partialis*

**Exercise No 23. Pathology of the female genital system**

- 23.1. *Cervical smear cytology – PAP-test I (normal cytology finding)*
- 23.3. *Cervical smear cytology – PAP-test IV*
- 23.5. *Carcinoma planocellulare in situ epithelii portionis vaginalis uteri*
- 23.6. *Carcinoma planocellulare invasivum cervicis uteri*

**Exercise No 24. Pathology of the female genital system**

- 24.1. *Leiomyoma uteri*
- 24.3. *Cystadenoma mucinosum ovarii*
- 24.4. *Adenocarcinoma endometrii*
- 20.5. *Leiomyosarcoma uteri*

**Exercise No 25. Pathology of the hematopoietic and lymphoid system**

- 25.1. *Lymphoma (morbus) Hodgkin - sclerosis nodularis*
- 25.2. *Lymphoma non Hodgkin (Low grade – small-cell lymphocytic lymphoma/chronic lymphocytic leukemia)*
- 25.3. *Plasmocytoma*
- 26.5. *Carcinoma planocellulare metastaticum in lymphonodo*

**Exercise No 26. Pathology of the skin**

- 26.1. *Cystis epidermalis cutis*
- 26.2. *Pilomatrixoma (Keratosis seborrhoica)*
- 26.3. *Keratoacanthoma*
- 26.5. *Verruca vulgaris*

**Exercise No 27. Pathology of the skin**

- 27.1. *Haemangioma capillare cutis*
- 27.3. *Melanoma cutis (HE + Fontana-Masson)*
- 27.4. *Carcinoma planocellulare infiltrativum cutis - gradus I*
- 27.5. *Carcinoma baseocellulare infiltrativum cutis*

**Exercise No 28. Pathology of the bone, joints and soft tissue**

- 28.1. *Giant cell tumour of the tendon sheath*
- 28.4. *Osteochondroma (exostosis osteocartilaginea)*
- 28.5. *Osteosarcoma*
- 28.6. *Chondrosarcoma - gradus II*

**Exercise No 29. Pathology of the central nervous system**

- 29.2. *Pseudocystis postencephalomalacica cerebri*
- 29.3. *Meningioma*
- 29.4. *Glioblastoma multiforme*
- 29.5. *Carcinoma microcellulare pulmonis metastaticum in cerebro*

**Exercise No 30.** Exercise of the student's choice

**NOTES:**

- Wearing white lab coats during practical classes, seminar exercises, and during the practical and theoretical parts of the exam is mandatory.
- Students are required to prepare for each exercise (theoretical part from the textbook and practical exercise manual + analyze images available in electronic form in the exercise manual). Attendance in practical classes is mandatory. During the exercises, a student can miss one exercise per semester. In case of absence from more than one exercise, the student must make up the missed exercises and pass them with the instructor or assistant. If the student attends less than 80% of the exercises, they will not be eligible to receive a signature in the index.

**2. Autopsy**

Students attend autopsies from 8:00 to 10:00 a.m. during the academic year. Attendance at 2 autopsies in the winter semester and 2 autopsies in the summer semester is mandatory; without this, students will not be able to obtain a signature in the index. Students attend the entire autopsy process. They are trained in observing morphological changes, with particular emphasis on reasoning and concluding in pathology and forming autopsy conclusions.

**3. Macroscopic diagnostics – Museum specimens**

Students are shown museum specimens with a special requirement for independent active work in describing and diagnosing the specimens.

Students also participate in the macroscopic description of diagnostic materials that belong to the thematic unit (planned exercise). This part of the practical training is conducted in the reception room of the Institut of Pathology, University Clinical Center of Republic Srpska, Banja Luka.

## **IV. EXAM**

### **1. Seminars**

Students are required to prepare and defend one seminar paper on a specified (chosen) pathology topic during the fifth or sixth semester of the academic year. Completed seminar work earns the student points and corresponding grades. For the successful completion of obligations related to seminar work, it is necessary to have a minimum of 1 point. These points are also included in the final score and overall grade (see the appendix at the end of this Information Guide).

### **2. The practical part of the exam**

The practical part of the exam involves describing and diagnosing one macroscopic and three histological specimens. Students must pass both parts of the practical exam, after which they can select an examiner by drawing a card with the examiners' names using a random selection method. Successfully passing the practical exam earns the student points and corresponding grades. A minimum of 6 points is necessary to pass the practical exam. These points are also included in the final score and overall grade (see the appendix at the end of this Information Guide).

### **List of exam questions (glass slides with histological sections of tissue lesions) for the practical part of the exam**

1. Hypertrophia myocardii.
2. Hyperplasia glandularis prostatae.
3. Infiltratio adiposa myocardii
4. Atrophia cyanotica hepatis.
5. Degeneratio adiposa (steatosis) hepatis
6. Necrosis haemorrhagica acuta cum steatonecrosi textu adipisi pancreati
7. Amyloidosis lymphonodo (HE + Congo red)
8. Calcificatio metastatica pulmonis.
9. Tophi urici.
10. Infarctus recens (ischaemicus) myocardii
11. Infarctus recens (haemorrhagicus) intestini tenui.
12. Naevus pigmentosus intradermalis
13. Ecchymoses cerebri
14. Embolia thrombotica ramorum arteriae pulmonalis.
15. Granulationes



16. Cicatrix post infarctum myocardii (HE Van Gieson)
17. Haemosiderosis pulmonis (HE +Perls)
18. Appendicitis acuta phlegmonosa
19. Abscessus cerebri.
20. Leptomeningitis purulenta acuta.
21. Myocarditis interstitialis.
22. Gromeluronephritis subacuta (glomerulonephritis progressiva rapida).
23. Pyelonephritis chronica
24. Tuberculosis disseminata pulmonis.
25. Lymphadenitis granulomatosa caseosa.
26. Morbus Crohn
27. Lipoma
28. Fibroma durum
29. Fibroadenoma mammae pericanalliculare
30. Liposarcoma
31. Arterioloclerosis hyalina renis (nephrosclerosis benigna).
32. Bronchopneumonia
33. Pneumonia lobaris (hepatisatio grisea).
34. Pneumonia chronica (in cursu organisatione)
35. Atherosclerosis – atheroma
36. Mebranae hyalinae intraalveolares pulmonis
37. Carcinoma microcellulare pulmonis.
38. Carcinoma planocellulare (squamocellulare) bronchi.
39. Diverticulum Meckeli
40. Tumour carcinoides bronchi (Bronchial carcinoid)
41. Adenocarcinoma pulmonis
42. Epulis gigantocellularis.
43. Laesio lymphoepithelialis glandulae salivaris (Sjogren's syndrome)
44. Tumour mixtus (adenoma plemorphe) glandulae salivaris.
45. Cystadenoma lymphomatosum glandulae salivaris (Warthin' tumour)
46. Ulcus chronicum ventriculi.
47. Diverticulosis (diverticulitis)
48. Adenoma tubulare intestini crassi.
49. Adenocarcinoma ventriculi – intestinal type
50. Adenocarcinoma ventriculi – diffuse type
51. Adenocarcinoma intestini crassi.
52. Adenocarcinoma intestini crassi metastaticum in lymphonodo.
53. Cirrhosis hepatis
54. Teratoma cysticum maturum ovarii (Cystis dermoides ovarii)
55. Adenocarcinoma intestini crassi metastaticum in hepate
56. Carcinoma hepatocellulare

57. Adenoma corticis glandulae suprarenalis
58. Struma lymphomatosa Hashimoto.
59. Adenoma folliculare glandulae thyreoideae.
60. Carcinoma papillare glandulae thyreoideae
61. Dysplasia mammae (Fibrocystic mammary changes)
62. Carcinoma ductale invasivum mammae.
63. Carcinoma lobulare invasivum mammae.
64. Carcinoma lucidocellulare (Clear cell type) renis
65. Carcinoma transitiocellulare (papillare) vesicae urinariae invasivum.
66. Adenocarcinoma prostatae.
67. Seminoma testis.
68. Endometriosis tubae uterinae
69. Mola hydatidosa partialis
70. Carcinoma in situ portionis vaginalis uteri.
71. Carcinoma planocellulare invasivum cervicis uteri.
72. Leiomyoma uteri.
73. Polypus cervicis uteri
74. Cystadenoma mucinosum ovarii.
75. Adenocarcinoma endometrii
76. Leiomyosarcoma uteri.
77. Lymphoma Hodgkin – sclerosis nodularis.
78. Lymphoma non Hodgkin (low grade – small-cell lymphocytic lymphoma / chronic lymphocytic leukemia)
79. Verruca vulgaris
80. Haemangioma capillare cutis.
81. Melanoma cutis ( HE + Fontana Masson)
82. Carcinoma planocellulare infiltrativum cutis - gradus I.
83. Carcinoma baseocellulare infiltrativum cutis.
84. Giant cell tumour of the tendon sheath
85. Osteochondroma
86. Chondrosarcoma – gradus II
87. Meningioma
88. Glioblastoma multiforme
89. Lymphadenitis granulomatosa (sarcoidosis)
90. Calcificatio mediae arteriarum uteri (sclerosis mediae calcificata Mönckeberg).
91. Nephroblastoma (Wilms tumour)
92. Plasmocytoma
93. Carcinoma planocellulare metastaticum in lymphonodo
94. Pilomatrixoma (Epithelioma calcificans Malherbe)
95. Haemorrhagia recens lienis
96. Keratoacanthoma

97. Molluscum contagiosum.
98. Osteosarcoma
99. Pseudocystis postencephalomalacica cerebri
100. Carcinoma microcellulare pulmonis metastaticum in cerebro

### **3. Theoretical parts of the exam**

#### **Colloquium 1 (part one of the final exam)**

Students are required to take the first colloquium (part one of the final exam) in the form of a test in the **General pathology** at the end of the fifth semester of the academic year. The colloquium is taken in the form of a written test with 50 questions. Four answers are offered to each question, of which only one is correct. To pass the colloquium, students must answer more than 50% of the questions correctly (correct answers to a minimum of 26 questions), earning 19 points. Regular students can take the first colloquium (part one of the final exam) during the January-February exam period (and April if organized). Once the colloquium (part one of the final exam) is passed, it is valid for all subsequent examination periods

#### **Colloquium 2 (part two of the the final exam)**

Students are required to take the second colloquium (part two of the final exam) in the form of a test in the **Special pathology** at the end of sixth semester of the academic year. The colloquium is taken in the form of a written test with 50 questions. Four answers are offered to each question, of which only one is correct. To pass the colloquium, students must answer more than 50% of the questions correctly (correct answers to a minimum of 26 questions), earning 24 points.

Students who do not pass the first colloquium (part one of the final exam) at the end of the fifth semester are required to take both colloquiums (the first colloquium - part one of the final exam + the second colloquium - part two of the final exam) at the end of the sixth semester.

Test results are announced the next day, and students can review their test with the assistant at the Institute of Pathology the following day.

Points earned on the first and second colloquium are also included in the final score and overall final grade (see the appendix at the end of this Information Guide).

## **List of exam questions for the theoretical part of the exam**

### **GENERAL PATHOLOGY**

#### **Cell Injury, Cell Death, and Adaptations**

1. Aetiology, pathogenesis, and morphology studies in pathology
2. Cell injury and sequence of events in cell injury and death
3. Cell death: necrosis and apoptosis
4. Mechanisms of cell injury and cell death
5. Cellular adaptations to stress
6. Intracellular and extracellular deposition
7. Cellular aging

#### **Inflammation and Repair**

8. General characteristics, types, and causes of inflammation
9. Acute inflammation
10. Mediators of inflammation
11. Morphologic patterns of acute inflammation
12. Outcomes of inflammation and chronic inflammation
13. Systemic effects of inflammation
14. Cell and tissue regeneration
15. Repair by scarring
16. Disorders in the tissue repair process

#### **Hemodynamic Disorders, Thromboembolism, and Shock**

17. Hyperemia and congestion
18. Edema
19. Hemorrhage
20. Thrombosis
21. Embolism
29. Infarction
22. Shock

#### **Diseases of the Immune System**

23. Innate immune response
24. Cells of the immune system
25. Adaptive immune system and lymphocyte activation
26. Hypersensitivity
27. Immediate (Type I) hypersensitivity
28. Antibody-mediated diseases (Type II hypersensitivity)
29. Immune complex-mediated diseases (Type III hypersensitivity)
30. T-cell mediated diseases (Type IV hypersensitivity)
31. Autoimmune diseases – immunologic tolerance and mechanisms of autoimmunity
32. Systemic lupus erythematosus

33. Rheumatoid arthritis and Sjögren syndrome
34. Systemic sclerosis (scleroderma)
35. Immunology of transplantation
36. Primary (congenital) immunodeficiencies
37. Defects in innate immunity and secondary (acquired) immunodeficiencies
38. Acquired immunodeficiency syndrome – AIDS
39. Amyloidosis

### **Neoplasia**

40. Nomenclature in neoplasia
41. Characteristics of benign and malignant neoplasms
42. Epidemiology of neoplasms and risk factors for their development
43. Genetic and epigenetic changes underlying cancer
44. Carcinogenesis: The multistep process of carcinogenesis and hallmarks of cancer
45. Carcinogenesis: Insensitivity to growth inhibitory signals – tumour suppressor genes
46. Carcinogenesis: Altered cellular metabolism and evasion of cell death
47. Carcinogenesis: Limitless replicative potential (cell immortality) and sustained angiogenesis
48. Carcinogenesis: Invasion and metastasis
49. Carcinogenesis: Evasion of immune surveillance
50. Carcinogenesis: Genomic instability and enabler of malignancy
51. Chemical and radiation carcinogens
52. Viral and microbial carcinogens
53. Effects of neoplasms on the host
54. Grading and staging of cancer
55. Laboratory diagnosis of cancer

### **Genetic and Paediatric Diseases**

56. The genome: Genetic basis of human diseases
57. Mutations and alterations in protein-coding genes
58. Mendelian disorders (Monogenic diseases): Inheritance patterns and diseases caused by mutations in structural protein genes
59. Diseases caused by gene mutations encoding receptor proteins and channels
60. Diseases caused by mutations in genes encoding enzymes
61. Complex multigenic disorders
62. Cytogenetic disorders: numeric and structural abnormalities
63. Cytogenetic disorders involving autosomes
64. Cytogenetic disorders involving sex chromosomes
65. Single-gene disorders with atypical patterns of inheritance
66. Congenital anomalies: types, aetiology, and pathogenesis
67. Perinatal infections, premature birth, and fetal growth restriction
68. Neonatal respiratory distress syndrome and necrotizing enterocolitis
69. Sudden infant death syndrome and fetal hydrops

70. Tumours and tumour-like lesions of infancy and childhood

71. Molecular diagnosis of genetic disorders

### **Environmental and nutritional diseases**

72. Health disparities and health effects of climate change

73. Toxicity of chemical and physical agents

74. Air pollution

75. Effects of tobacco

76. Effects of alcohol

77. Injury caused by therapeutic drugs and nonprescribed substances

78. Injury by physical agents: thermal and electrical injury, injury caused by ionizing radiation

79. Malnutrition, anorexia, and bulimia

80. Vitamin deficiencies and toxicity

81. Obesity

82. Diet and systemic diseases and cancer

## **SPECIAL PATHOLOGY**

### **Vascular Pathology**

83. Hypertensive vascular disease

84. Atherosclerosis

85. Aneurysms and dissections

86. Vasculitis

87. Pathology of veins and lymphatic vessels

88. Vascular tumours

### **Heart Pathology**

89. Heart failure

90. Congenital heart diseases

91. Ischemic heart disease: epidemiology, pathogenesis, and angina pectoris

92. Ischemic heart disease: myocardial infarction and chronic ischemic heart disease

93. Hypertensive heart disease and arrhythmias

94. Valvular heart diseases

95. Cardiomyopathies

96. Myocarditis and other causes of myocardial diseases

97. Heart tumours and pericardial diseases

### **Pathology of the Hematopoietic and Lymphatic Systems**

98. Nonneoplastic disorders of white cells (leukopenia, reactive leukocytosis, reactive lymphadenitis)

99. Acute leukemias

100. Myelodysplastic syndrome and myeloproliferative neoplasms

101. Non-Hodgkin lymphoma (classification and pathogenesis)
102. Non-Hodgkin lymphoma (follicular lymphoma, diffuse large B-cell lymphoma)
103. Non-Hodgkin lymphoma (Burkitt lymphoma, miscellaneous lymphoid neoplasms)
104. Hodgkin lymphoma
105. Plasma cell neoplasms and related entities
106. Histiocytic neoplasms
107. Disseminated intravascular coagulation (DIC)
108. Disorders of the spleen and the thymus

### **Lung Pathology**

109. Atelectasis, acute lung injuries and acute respiratory distress syndrome
110. Obstructive lung (airway) diseases
111. Chronic interstitial (restrictive, infiltrative) lung diseases
112. Diseases of pulmonary vessels (pulmonary embolism, haemorrhage, infarction and pulmonary hypertension)
113. Pulmonary infections
114. Tuberculosis
115. Pneumonias in immunocompromised hosts and fungal pneumonias
116. Lung tumours
117. Pleural lesions
118. Acute infections and tumours of the upper respiratory tract

### **Kidney Pathology**

119. Clinical manifestations of renal diseases and general characteristics and mechanisms of glomerular injury and diseases
120. Renal disorders presenting with the nephrotic syndrome
121. Renal disorders presenting with nephritic syndrome and other glomerular diseases
122. Acute pyelonephritis
123. Chronic pyelonephritis, tubulointerstitial nephritis and acute tubular injury
124. Kidney diseases involving blood vessels
125. Chronic kidney disease and cystic kidney diseases
126. Diseases related to urinary tract obstruction (urolithiasis, hydronephrosis)
127. Kidney neoplasms

### **Pathology of the Oral Cavity and Gastrointestinal Tract**

128. Dental diseases, odontogenic cysts and tumours, oral inflammatory, proliferative and neoplastic lesions
129. Diseases of the salivary glands
130. Obstructive and vascular diseases of the oesophagus and oesophagitis
131. Esophageal tumours
132. Gastropathy, acute and chronic gastritis
133. Complications of chronic gastritis: peptic ulcer, mucosal atrophy, metaplasia, dysplasia
134. Gastric polyps and tumours

135. Intestinal obstruction and vascular disorders of the bowel
136. Malabsorptive diarrhoea
137. Infectious enterocolitis
138. Inflammatory bowel disease
139. Colonic polyps and neoplastic disease
140. Diseases of the appendix (acute appendicitis, tumours of the appendix)

#### **Liver and Biliary Tract Pathology**

141. Liver failure and cirrhosis
142. Viral hepatitis
143. Bacterial, parasitic, and helminthic infections, autoimmune hepatitis, and drug- and toxin-induced liver injury
144. Alcoholic-related and nonalcoholic fatty liver disease
145. Inherited metabolic liver diseases
146. Cholestatic disorders
147. Autoimmune cholangiopathies and circulatory disorders of the liver
148. Nodules and neoplasms of the liver
149. Cholelithiasis (gallstone disease) and cholecystitis
150. Carcinoma of the gallbladder

#### **Pancreatic Pathology**

151. Congenital anomalies of the pancreas and pancreatitis
152. Pancreatic neoplasms

#### **Pathology of the Male Genital System and Lower Urinary Tract**

153. Diseases of the penis and cryptorchidism
154. Inflammatory, vascular, and neoplastic diseases of the testis
155. Prostatitis and benign prostatic hyperplasia
156. Carcinoma of the prostate
157. Congenital disorders, inflammation and neoplasms of the ureter and the urinary bladder
158. Sexually transmitted infections

#### **Pathology of the Female Genital System and Breast**

159. Inflammations and neoplasms of the vulva
160. Cervicitis and neoplasia of the cervix
161. Endometritis and endometriosis
162. Abnormal uterine bleeding and proliferative lesions of the endometrium and myometrium
163. Fallopian tubes pathology
164. Ovarian cysts and neoplasms
165. Diseases of pregnancy (placental inflammation, ectopic pregnancy, preeclampsia/eclampsia, gestational trophoblastic disease)
166. Clinical presentations of breast disease, inflammation, stromal and benign epithelial breast lesions
167. Carcinoma of the breast



### **Endocrine System Pathology**

168. Hyperpituitarism and the anterior pituitary tumours
169. Hypopituitarism and posterior pituitary disorders
170. Hyperthyroidism and hypothyroidism
171. Autoimmune thyroid diseases
172. Diffuse and multinodular goitre
173. Thyroid neoplasms
174. Hyperparathyroidism and hypoparathyroidism
175. Diabetes mellitus – pathogenesis of type I and type II diabetes mellitus and other subtypes
176. Diabetes mellitus – clinical features and chronic complications
177. Adrenocortical hyperfunction (Cushing syndrome, hyperaldosteronism, adrenogenital syndrome)
178. Adrenocortical insufficiency
179. Adrenocortical and adrenal medulla neoplasms
180. Multiple endocrine neoplasia (MEN) syndromes

### **Pathology of Bones, Joints, and Soft Tissues**

181. Congenital disorders of bone and cartilage and metabolic disorders of bone
182. Metabolic bone diseases
183. Paget's disease of bone (osteitis deformans)
184. Fractures and osteonecrosis (avascular necrosis)
185. Osteomyelitis
186. Bone tumours and tumour-like lesions
187. Osteoarthritis and rheumatoid arthritis
188. Juvenile idiopathic arthritis, seronegative spondyloarthropathies and infectious arthritis
189. Joint tumours and tumour-like conditions
190. Soft tissue tumours (adipose, fibrous, skeletal muscle, smooth muscle tumours, and tumours of uncertain origin)

### **Pathology of Peripheral Nerves and Muscles**

191. Disorders of peripheral nerves
192. Disorders of the neuromuscular junction
193. Disorders of skeletal muscle
194. Peripheral nerve tumours

### **Pathology of the Central Nervous System and eye**

195. Edema, herniation, and hydrocephalus
196. Congenital malformations and genetic metabolic diseases
197. Cerebrovascular diseases
198. Trauma of the central nervous system
199. Infectious diseases of the nervous system
200. Diseases of myelin – multiple sclerosis and leukodystrophies
201. Neurodegenerative diseases – prion diseases, Alzheimer's disease and frontotemporal

lobar degeneration

202. Neurodegenerative diseases – Parkinson's disease, Huntington's disease, spinocerebellar degenerations, and amyotrophic lateral sclerosis
203. Tumours of the central nervous system
204. Diseases of the conjunctiva, cornea, and anterior eye segment
205. Disorders of the retina and optic nerve

### **Skin Pathology**

206. Acute inflammatory dermatoses
207. Chronic inflammatory dermatoses
208. Infectious dermatoses
209. Blistering (Bulous) disorders
210. Skin tumours

## **V. LITERATURE**

### **1. Mandatory literature**

- Kumar V, Abbas AK, Aster JC, Deyrup AT, Das A. Robbins and Kumar Basic Pathology; Eleventh Edition; International Edition; Elsevier, 2023.
- Gajanin R, Ćuk M, Živković N. Histopathology Practicum for Students of Medicine and Dentistry. Medicinski fakultet Foča, 2024.

### **2. Additional literature**

- Cross SS. Underwood's Pathology: a Clinical Approach. Seventh Edition; Elsevier, 2018.
- Reisner H. Pathology: a Modern Case Studies, Second Edition, McGraw-Hill, 2020.

## **VI. LIST OF LECTURERS**

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## VII. FORMS OF KNOWLEDGE TESTING

### 1. Final scoring system

<b>Criteria</b>	<b>Maximum number of points</b>	<b>Minimum number of points necessary to pass</b>
Activity in lectures	5	1
Seminar paper	5	1
Practical exam	10	6
Colloquium 1 / Part one of final exam (General pathology)	35	18
Coloquium 2 / Part two of final exam (Special pathology)	45	23
<b>Total</b>	<b>100</b>	<b>51</b>

<b>Final number of points</b>	<b>Final grade</b>
91-100	10
81-90	9
71-80	8
61-70	7
51-60	6

0-50	5
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## 2. Scoring pre-exam duties

Activity in lectures (The number of lecture hours attended by the student)	Number of points	Grade
135-150	5	10
120-134	4	9
106-119	3	8
90-105	2	7
76-89	1	6
0-75	0	5

Points for the seminar paper	Grade
5	10
4	9
3	8
2	7
1	6
0-5	5

## 3. Scoring for final exams

Points on the practical exam	Grade
10	10
9	9
8	8
7	7
6	6
0-5	5

<b>Colloquium 1 / Part one of final exam (written test) - Number of correct answers to a total of 50 questions</b>	<b>Points</b>	<b>Grade</b>
<b>49-50</b>	35	10
<b>44-48</b>	31	9
<b>37-43</b>	27	8
<b>31-36</b>	23	7
<b>26-30</b>	19	6
<b>0-25</b>	0	5

<b>Colloquium 2 / Final exam / Part two of final exam (written test) - Number of correct answers to a total of 50 questions</b>	<b>Points</b>	<b>Grade</b>
<b>49-50</b>	45	10
<b>44-48</b>	40	9
<b>37-43</b>	35	8
<b>31-36</b>	30	7
<b>26-30</b>	24	6
<b>0-25</b>	0	5

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