INFORMATION ABOUT THE COURSE

Pathomorphology

1. Basic information

Field of studies field of medical and health sciences, discipline: medical sciences **Unit responsible for the field of studies** Faculty of Medicine Bydgoszcz University of Science and Technology **Level of studies** Uniform master's studies **Profile of studies** General academic **Form of studies** Full-time	**Studies cycle** …….. **Course code** 17-EMS-PPH-SP1 **Language** English **Obligatory** Yes

Prerequisites	Basic knowledge of anatomy and histology in the structure and function of tissues and organs. Method of verification: Passing the subjects defined as introductory is equivalent to fulfilling the entry requirements for the subject.
Introductory courses	Anatomy, Histology
Coordinator	Adam Kowalewski, PhD

Study period	**Form of assessment** **Form and hours of classes**	**ECTS credits**
Winter semester	Exam Lecture 20h Exercise 30h Seminar 40h	7.0

2. Learning outcomes

Code	**Description of learning outcomes**	**Learning outcomes reference**
Knowledge (student knows and understands):		
K1	Graduates are familiar with examples of disorders in communication between cells and between cells and the extracellular matrix, as well as signal transduction pathways within cells, leading to the development of cancer and other diseases.	B.W16.
K2	Graduates know and can distinguish between the stages of the cell cycle and tissue damage and repair, adaptive and degenerative processes, cell aging, apoptosis, and necrosis in relation to the morphological and clinical picture of selected diseases.	B.W17.
K3	Graduates know and understand the etiology, mechanisms, and consequences of hemodynamic disorders.	C.W24.

K4	Graduates know and understand organ pathology, macro- and microscopic pathomorphological changes, and clinical consequences, including pathomorphological terminology.	C.W25.
K5	Graduates know and understand the pathogenesis of diseases, including genetic and environmental factors.	C.W26.
K6	Graduates know and understand the pathomechanism and clinical forms of the most common diseases of individual systems and organs.	C.W27.
K7	Graduates know and understand the impact of oxidative stress on cells and its significance in the pathogenesis of diseases and in the processes occurring during the aging of the body.	C.W38.
K8	Graduates know and understand the practical elements of molecular biology and immunology used in the diagnosis and treatment of oncological diseases.	C.W43.
K9	Graduates know and understand the development, structure, and functions of the human body under normal and pathological conditions.	O.W1.
K10	Graduates know and understand the symptoms and progression of diseases.	O.W2.
Abilities (student can do/perform):		
A1	The graduate analyzes microscopic images from a light microscope and, on this basis, distinguishes between selected images and diseases.	A.U1.
A2	The graduate recognizes histological structures corresponding to organs, tissues, cells, and cellular structures in images from an optical microscope, and describes and interprets their structure.	A.U2.
A3	Graduates are able to identify pathogens under a microscope.	C.U5.
A4	Graduates are able to correlate images of tissue and organ damage with clinical symptoms of disease in order to establish a diagnosis in the most common diseases of adults and children.	C.U7.
A5	Graduates are able to formulate conclusions regarding the diagnosis of adult diseases based on the overall clinical picture (clinical data, radiological and laboratory tests, and pathological examination).	E.U9.
A6	Graduates are able to formulate conclusions regarding the diagnosis of children diseases based on the overall clinical picture (clinical data, radiological and laboratory tests, and pathological examination).	E.U10.
A7	Graduates are able to communicate within a team and share knowledge.	O.U8.
A8	Graduates are able to critically evaluate scientific research results and justify their position appropriately.	O.U9.
Social skills (the student is ready to):		

S1	The graduate is ready to use objective sources of information.	O.K7.
S2	The graduate is ready to formulate conclusions based on their own measurements or observations.	O.K8.

3. Programme contents

No.	Programme contents	Form of studies	Learning outcomes covered by the programme content
1	General and systematic pathomorphology, organ and systemic pathology, neoplasia, diagnostics, childhood pathologies, environmental changes, and addictions 1. Introduction to pathomorphology: history, definitions, methods, legal aspects, tumor markers 2. Degenerations (protein, fat, sugar, pigment, calcium, porphyria) 3. Necrosis, apoptosis, autophagy, regeneration, aging 4. Circulatory disorders: clots, thrombi, hemorrhages, congestion, hyperemia, ischemia, infarction, edema 5. Pathology of inflammation: acute and chronic 6. Specific inflammation: infectious and fungal diseases 7. Immunopathology: autoimmunity, allergies, microchimerism 8. Neoplasia: hyperplasia, hypertrophy, precancerous conditions, carcinogenesis, TNM classification 9. Epithelial tumors: cytodiagnostics, routes of spread 10. Respiratory system: inflammatory and neoplastic changes 11. Heart: inflammation, cardiomyopathies, neoplasms 12. Vessels and atherosclerosis 13. Gastrointestinal tract: oral cavity to large intestine 14. Liver, bile ducts, and pancreas 15. Urinary system: kidneys, bladder, urethra 16. Female reproductive system 17. Male reproductive system 18. Mammary gland (including male nipple) 19. Endocrine system and neuroendocrine syndromes 20. Allergies and allergic changes 21. Musculoskeletal and muscular system 22. Neuropathology: CNS and peripheral 23. Hematopathology: bone marrow, lymph nodes 24. Pathomorphology of the fetus and newborn 25. Pathology of the skin and subcutaneous tissue 26. Alcoholism, nicotine addiction, drug addiction, and their morphological changes	Lecture	K1, K2, K3, K4, K5, K6, K7, K8, K9, K10
2	Practical recognition of microscopic and macroscopic changes, working with specimens, recognizing tumors, inflammatory changes, degeneration, organ diseases 1. Diagnostic methods in pathomorphology (standard and auxiliary, tumor markers) 2. Degeneration	Exercise	A1, A2, A3, A4, A5, A6, A7, A8, S1, S2

	3. Necrosis, regeneration, metaplasia 4. Circulatory disorders: thrombosis, embolism, infarction, etc. 5. Inflammatory pathology (acute and chronic), autoimmunity, allergies 6. Specific inflammations (tuberculosis, syphilis, sarcoidosis, mycosis, etc.) 7. Hyperplasia, hypertrophy, carcinogenesis, tumor classifications 8. Epithelial and non-epithelial tumors 9. Respiratory system pathology 10. Heart pathology 11. Vascular diseases and atherosclerosis 12. Gastrointestinal tract pathology (also as part of a review) 13. Liver, bile duct, and pancreas pathology 14. Pathology of the urinary system 15. Pathology of the female and male reproductive systems 16. Pathology of the mammary gland 17. Pathology of the musculoskeletal system 18. Neuropathology 19. Hematopathology 20. Pathomorphology of the skin and subcutaneous tissue 21. Pathomorphology of the fetus and newborn		
3	Clinical and pathomorphological case studies, interpretation of changes in a clinical context, supplementing knowledge with practical aspects, diagnostic and therapeutic difficulties. 1. Circulatory disorders (thrombosis, embolism, heart attack, edema) – case studies 2. Inflammatory pathology (classifications, differentiation, mechanisms) 3. Specific inflammations – diagnostic difficulties and case studies	Seminar	K5, K6, K7, K9, K10, A7, A8, S1, S2

4. Methods of verifying and assessing the learning outcomes achieved by the student

Winter semester

Form of studies		
Lecture	**Methods of studies form:**	
	Lecture	
	Methods of verification:	**Involvement:**
	Written exam	100%
	Conditions for passing the course:	
	Written examination in the form of a single-choice test (100 questions). Pass mark 60%. Assessment criteria in accordance with the Academic Regulations. Only students who have passed the exercises will be admitted to the exam.	
Exercise	**Methods of studies form:**	
	Laboratory exercise, Showcase, Discussion	

	Methods of verification:	**Involvement:**
	Colloquium	90%
	Observation	10%
	Conditions for passing the course:	
	A prerequisite for passing the exercise part of the course is a positive mark in each of the three colloquia testing knowledge from lectures and exercises. Each test is a single-choice test (30 questions). The pass mark is 60%. Grading criteria in accordance with the Academic Regulations.	
Seminar	**Methods of studies form:**	
	Discussion, Group work	
	Methods of verification:	**Involvement:**
	Presentation	80%
	Observation	20%
	Conditions for passing the course:	
	Prepare a presentation on a topic assigned by the teacher.	

Learning outcomes	**Methods of verification**			
	Written exam	Colloquium	Observation	Presentation
K1	X	X	X	
K2	X	X	X	
K3	X	X	X	
K4	X	X	X	
K5	X	X	X	
K6	X	X	X	
K7	X	X	X	
K8	X	X	X	
K9	X	X	X	
K10	X	X	X	
A1			X	
A2			X	
A3			X	
A4			X	

A5			X	
A6			X	
A7			X	
A8			X	
S1			X	X
S2			X	X

5. Student workload – balance of hours and ECTS credits

Students activity		**Student workload Number of hours**
Classes conducted with the direct participation of an academic teacher or other persons conducting classes	Lecture	20
	Exercise	30
	Seminar	40
Student's own work	Preparing for classes	20
	Studying literature	15
	Preparing for a test	20
	Preparing for an exam	20
	Preparing a presentation	10
Total student workload		175
ECTS		7

One (teaching) hour is 45 minutes.

6. Literature

The list of required and recommended literature will be provided by the lecturer at the first meeting.