

**Course description (syllabus) form for higher education, doctoral,
postgraduate and skills development programs**

A) General course description

Field name	Comments
Course title	Pathophysiology
Unit organising the course	Department of Pathophysiology Faculty of Pharmacy Nicolaus Copernicus University in Toruń Ludwik Rydygier Collegium Medicum in Bydgoszcz
Unit for which the course is organised	Faculty of Medicine Nicolaus Copernicus University in Toruń Ludwik Rydygier Collegium Medicum in Bydgoszcz Field of study: Medicine Paid Full-Time Studies in English
Course ID	1655-Lek22PATO-J
ISCED code	0912
ECTS credit allocation	6.0
Form of course completion assessment	Exam
Language of instruction	English
Indication whether attempts at obtaining course credit can be repeated	No
Affiliation of the course to a course group	<i>Preclinical Sciences (Group C)</i>
Total student workload	<p>1. Workload associated with direct participation of academic teachers: - lectures: 30 h - tutorials: 45 h - colloquiums: 3h - final test: 2 h Total workload involving the direct participation of academic teachers: 80 h, which equals 3.2 of an ECTS point.</p> <p>2. Total student workload: - lectures: 30 h - tutorials: 45 h - preparation for tutorials and colloquiums (including reading of the selected literature and written tasks completion): 43 h + 13 h = 56 h - preparation for final test and final test: 15 h + 2 h = 17 h - preparation of project/presentation: 2 h Total student workload: 150 h, which equals 6 ECTS point.</p> <p>3. Workload related to achievement of learning outcomes in medical simulation settings: <i>Not applicable</i></p>

	<p>4. Workload associated with achievement of learning outcomes related to medical communication: <i>Not applicable</i></p>
Learning outcomes: knowledge	<p>W1: Uses pathomorphological nomenclature in the description of selected diseases (C.W25). W2: Discusses the participation of the inflammatory process of a specific and non-specific nature in the etiopathogenesis and course of selected disease entities, e.g., in atherosclerosis, diabetes, cancer, obesity, autoimmune diseases (B.W15, C.W23). W3: Defines the classification, clinical picture, and compensation mechanisms of anaphylactic, septic, hypovolemic, cardiogenic, and neurogenic shock (C.W24, C.W29). W4: Discusses the etiopathogenesis, clinical course, and diagnostics of selected disease entities of the cardiovascular, respiratory, nervous, endocrine, urogenital, hematopoietic, and digestive systems (C.W24, C.W26, C.W.27). W5: Characterizes the consequences of developing tissue and organ damage with clinical symptoms of the disease and the results of diagnostic tests (C.W26, C.W.27). W6: Specifies external and internal pathogens, as well as modifiable and non-modifiable pathogens (C.W26). W7: Discusses the pathomechanism and clinical consequences of diseases of the cardiovascular, respiratory, nervous, endocrine, genitourinary, hematopoietic, digestive systems, as well as disturbances in the water-electrolyte and acid-base balance (C.W27). W8: Describes the directions of the newest therapeutic strategies for selected diseases (B.W15, C.W33). W9: Discusses the role of oxidative stress in the pathogenesis of metabolic diseases, neurodegenerative diseases, and the aging process (B.W15, C.W38). W10: Indicates disturbances in the metabolism of minerals and vitamins (C.W39). W11: Describes the effect of disturbances in the secretion of digestive enzymes on the development of diseases of the digestive system (C.W27). W12: Characterizes the influence of eating disorders on the development of civilization diseases (C.W40).</p>
Learning outcomes: practical skills	<p>Student: U1: Assesses changes at the cellular, tissue, and organ levels in the course of selected pathological states and associates them with clinical symptoms and test results (C.U7). U2: Interprets the results of laboratory tests in selected disease entities (C.U7). U3: Correctly plans the diagnostic and therapeutic algorithm of selected disease entities (C.U7).</p>
Learning outcomes - social competence	<p>Student: K1: Uses objective sources of scientific information in conjunction with the acquired knowledge in the pathophysiology of diseases (K_K07). K2: Respects ethical standards (K_K01). K3: Demonstrates an attitude of cooperation in a team (K_K09). K4: Demonstrates the attitude of continuous self-education (K_K05).</p>
Teaching methods	<p>Lectures: - informative lecture, - problem lecture, - seminar lecture, - case study.</p>

	<p>Tutorials:</p> <ul style="list-style-type: none"> - didactic discussion, - analysis of research, - case study, - computer-assisted learning, - exposing methods: film, show, - didactic movies and games.
Prerequisites	To realize the described subject it is necessary to know elements of anatomy in the field of structure and topography of individual organs; physiology of the functions of individual organs and systems, biochemistry in the field of metabolic processes taking into account the metabolic pathways: carbohydrates, lipids, proteins, as well as the metabolism of nucleic acids.
Brief course description	Pathophysiology describes etiology and origins of mechanisms for functional disorders within an organism in various pathological stages. It covers pathophysiology of organs and systems, issues in relation to changes in adaptation functions of organism, disorders of organism's regulatory functions, metabolic disorders and pathophysiology of cancer.
Full course description	<p>Lectures:</p> <p>The aim of the lectures is to familiarize the student with the detailed mechanisms of the formation of disorders in organs and systems, as well as to extend the student's knowledge with clinical symptoms and diagnostics of individual disease entities. During the lectures the student discusses the etiopathogenesis of cardiovascular and endocrine diseases and the pathophysiology of the hematopoietic system.</p> <p>Tutorials:</p> <p>Tutorials are aimed at: familiarizing the student with the detailed mechanisms of the formation of disorders in systems and organs, developing the ability to connect disorders at the cellular, tissue and organ levels with clinical symptoms and the results of research in individual disease entities.</p>
Literature	<p>Primary literature:</p> <ol style="list-style-type: none"> 1. McPhee SJ, Ganong WF: Pathophysiology of Disease: An Introduction to Clinical Medicine. International Edition. McGraw-Hill, 2006, 5th edition. 2. Copstead LE, Banasik J: Pathophysiology. Elsevier, 2013, 5th edition. <p>Supplementary literature:</p> <p>Fauci AS, et al.: Harrison's Principles of Internal Medicine. McGraw-Hill, 2008, 17th edition.</p> <p>Chapters (Volume I & II): 98, 100, 104, 110, 221, 225, 226, 235, 248, 273, 274, 287, 300, 335, 338.</p>
Assessment methods and criteria	<p>The basis for passing pathophysiology is obtaining positive grades from all pop quiz, partial tests, and final test and adherence to the rules included in the Didactic Regulations of the Department of Pathophysiology.</p> <p>Course credit criteria:</p> <ul style="list-style-type: none"> - written partial tests: pass \geq 60% (W1, W2, W4-W9, W11, U1, K1, K4), - written final test (verification of learning outcomes from the entire cycle): pass \geq 60% (W1-W12, U1-U3, K1, K4), - directed observation of the student during practical tasks (\geq 60%): W1, W2, W4-W9, W11, U1-U3, K1- K4).
Work placement	<i>Not applicable</i>

B) Description of the course within the period of instruction

Field name	Comments
Period of instruction	4 th semester (2025/2026, summer semester)
Form of assessment of course completion in the period of instruction	Exam
Form(s) of classes, number of hours and completion assessment methods	Lectures – 30 h: final test Tutorials – 45 h: ungraded credit
Name of course coordinator in the period of instruction	Prof. dr hab. Ewa Żekanowska
Names of persons managing student groups for the course	Lectures: Dr hab. Artur Słomka, prof. UMK Tutorials: Dr hab. Artur Słomka, prof. UMK Dr Joanna Boinska Dr Justyna Małkowska Dr Inga Dziembowska Dr Katarzyna Ziolkowska Lek. Mateusz Wartęga Mgr Iga Schachta
Course attributes	Obligatory
Course groups including description and limit to the number of students within the groups	Lectures: all 2nd year students Tutorials: 12 students
Time and place of classes	Information provided by the Dean's Office of the Faculty of Medicine and Centre for Medical Education in English at NCU Collegium Medicum in Bydgoszcz
Number of study hours involving distance learning methods	-
Course website	https://www.wf.cm.umk.pl/katpatofiz/english-division/
Learning outcomes defined for a given form of classes within the course	Lectures: W1: Uses pathomorphological nomenclature in the description of selected diseases (C.W25). W2: Discusses the participation of the inflammatory process of a specific and non-specific nature in the etiopathogenesis and course of selected disease entities, e.g., in atherosclerosis, diabetes, cancer, obesity, autoimmune diseases (B.W15, C.W23). W3: Defines the classification, clinical picture, and compensation mechanisms of anaphylactic, septic, hypovolemic, cardiogenic, and neurogenic shock (C.W24, C.W29). W4: Discusses the etiopathogenesis, clinical course, and diagnostics of selected disease entities of the cardiovascular, respiratory, nervous, endocrine, urogenital, hematopoietic, and digestive systems (C.W24, C.W26, C.W27). W5: Characterizes the consequences of developing tissue and organ damage with clinical symptoms of the disease and the results of

diagnostic tests (C.W26, C.W27).

W6: Specifies external and internal pathogens, as well as modifiable and non-modifiable pathogens (C.W26).

W7: Discusses the pathomechanism and clinical consequences of diseases of the cardiovascular, respiratory, nervous, endocrine, genitourinary, hematopoietic, digestive systems, as well as disturbances in the water-electrolyte and acid-base balance (C.W27).

W8: Describes the directions of the newest therapeutic strategies for selected diseases (B.W15, C.W33).

W9: Discusses the role of oxidative stress in the pathogenesis of metabolic diseases, neurodegenerative diseases, and the aging process (B.W15, C.W38).

W10: Indicates disturbances in the metabolism of minerals and vitamins (C.W39).

W11: Describes the effect of disturbances in the secretion of digestive enzymes on the development of diseases of the digestive system (C.W27).

W12: Characterizes the influence of eating disorders on the development of civilization diseases (C.W40).

U1: Assesses changes at the cellular, tissue, and organ levels in the course of selected pathological states and associates them with clinical symptoms and test results (C.U7).

K1: Uses objective sources of scientific information in conjunction with the acquired knowledge in the pathophysiology of diseases (K_K07).

K4: Demonstrates the attitude of continuous self-education (K_K05).

Tutorials:

W1: Uses pathomorphological nomenclature in the description of selected diseases (C.W25).

W2: Discusses the participation of the inflammatory process of a specific and non-specific nature in the etiopathogenesis and course of selected disease entities, e.g., in atherosclerosis, diabetes, cancer, obesity, autoimmune diseases (B.W15, C.W23).

W4: Discusses the etiopathogenesis, clinical course, and diagnostics of selected disease entities of the cardiovascular, respiratory, nervous, endocrine, urogenital, hematopoietic, and digestive systems (C.W.24, C.W26, C.W27).

W5: Characterizes the consequences of developing tissue and organ damage with clinical symptoms of the disease and the results of diagnostic tests (C.W26, C.W27).

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W7: Discusses the pathomechanism and clinical consequences of diseases of the cardiovascular, respiratory, nervous, endocrine, genitourinary, hematopoietic, digestive systems, as well as disturbances in the water-electrolyte and acid-base balance (C.W27).

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W11: Describes the effect of disturbances in the secretion of digestive enzymes on the development of diseases of the digestive

	<p>system (C.W27).</p> <p>U1: Assesses changes at the cellular, tissue, and organ levels in the course of selected pathological states and associates them with clinical symptoms and test results (C.U7).</p> <p>U2: Interprets the results of laboratory tests in selected disease entities (C.U7).</p> <p>U3: Correctly plans the diagnostic and therapeutic algorithm of selected disease entities (C.U7).</p> <p>K1: Uses objective sources of scientific information in conjunction with the acquired knowledge in the pathophysiology of diseases (K_K07).</p> <p>K2: Respects ethical standards (K_K01).</p> <p>K3: Demonstrates an attitude of cooperation in a team (K_K09).</p> <p>K4: Demonstrates the attitude of continuous self-education (K_K05).</p>
<p>Assessment methods and criteria for a given form of classes within the course</p>	<p>The basis for passing pathophysiology is obtaining positive grades from all pop quiz, partial tests, and final test and adherence to the rules included in the Didactic Regulations of the Department of Pathophysiology.</p> <p>Course credit criteria:</p> <p>Lectures:</p> <ul style="list-style-type: none"> - written final test: pass \geq 60% (W1-W12, U1-U3, K1, K4). <p>Tutorials:</p> <ul style="list-style-type: none"> - written partial tests: pass \geq 60% (W1, W2, W4-W9, W11, U1, K1, K4), - written final test: pass \geq 60% (W1-W12, U1-U3, K1, K4), - directed observation of the student during practical tasks (\geq 60%): W1, W2, W4-W9, W11, U1-U3, K1- K4).
<p>Course content</p>	<p>Lectures - topics:</p> <ol style="list-style-type: none"> 1. Pathophysiology in an interdisciplinary approach. 2. The role of the inflammatory process in the pathophysiology of diseases. 3. Pathophysiology of atherosclerosis and ischemic heart disease. 4. Pathophysiology and classification of shock. 5. Etiopathogenesis of arterial hypertension. 6. Insomnia and disturbances of circadian rhythms. 7. Disorders of carbohydrate metabolism. 8. Obesity and metabolic syndrome. 9. Disturbances in the metabolism of minerals and vitamins. Eating disorders. 10. Hematopoiesis. Diseases of the red blood cell system. 11. Diseases of the white blood cell system. 12. Hemostasis. Hemorrhagic diathesis. 13. Thrombophilia. 14. Pathophysiology of the aging process. Neurodegenerative diseases. 15. Cancers. Mechanisms of neoplastic transformation. <p>Tutorials - topics:</p> <ol style="list-style-type: none"> 1. Changes in the electrocardiogram record. Disorders of stimulus and conduction of the heart. 2. Ischemic heart disease and acute coronary syndromes. 3. Pathophysiology of stroke. 4. Pathophysiology of the respiratory system. 5. Disturbances of acid-base balance. 6. Pathophysiology of kidney diseases.

	<p>7. Disorders of calcium and phosphate metabolism.</p> <p>8. Pathophysiology of diabetes mellitus.</p> <p>9. Pathomechanism of pituitary and thyroid diseases.</p> <p>10. Pathomechanism of adrenal gland diseases. Overactive and underactive of sex glands.</p> <p>11. Liver pathology. Digestive system pathology.</p> <p>12. Pathophysiology of anemia.</p> <p>13. Pathophysiology of the proliferative states of the white blood cell system.</p> <p>14. Pathophysiology of congenital and acquired bleeding disorders.</p> <p>15. Pathophysiology of blood hypercoagulability.</p>
Teaching methods	<p>Lectures:</p> <ul style="list-style-type: none"> - informative lecture, - problem lecture, - seminar lecture, - case study. <p>Tutorials:</p> <ul style="list-style-type: none"> - didactic discussion, - analysis of research, - case study, - computer-assisted learning, - exposing methods: film, show, - didactic movies and games.
Literature	<p>Primary literature:</p> <ol style="list-style-type: none"> 1. McPhee SJ, Ganong WF: Pathophysiology of Disease: An Introduction to Clinical Medicine. International Edition. McGraw-Hill, 2006, 5th edition. 2. Copstead LE, Banasik J: Pathophysiology. Elsevier, 2013, 5th edition. <p>Supplementary literature:</p> <p>Fauci AS, et al.: Harrison's Principles of Internal Medicine. McGraw-Hill, 2008, 17th edition.</p> <p>Chapters (Volume I & II): 98, 100, 104, 110, 221, 225, 226, 235, 248, 273, 274, 287, 300, 335, 338.</p>