

**Al-Farabi Kazakh National University
Faculty of Medicine and Health Care
Higher School of Medicine
Department of Fundamental medicine**

AFFIRM
Dean of the Faculty
(signature)

_____ **Kalmatayeva Z.A.**
" _____ " _____ **2022**

EDUCATIONAL AND METHODOLOGICAL COMPLEX OF DISCIPLINE
MiF1202 «Morphology and human physiology»

6B10104 Dentistry

Course– 1
Semester – 2
Number of credit– 11

Almaty 2022

Educational and methodical complex of discipline was compiled by master of medical sciences Kassenova Gulzhan, master of medical sciences Oralkhan Zhibek

Based on the educational program 6B10104 Dentistry

Considered and recommended at a meeting of the fundamental medicine department
from "___" _____ 202_, protocol No. ...

Head of the department _____ Sarsenova L.K.
(signature)

Recommended by the Methodological Council of the Higher School of Medicine
"___" _____ 202_, protocol No.

Chairman of the Method Council of the Higher School of Medicine _____ Dzhumasheva R.T.

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SYLLABUS

Fall semester, academic year 2022-2023

Academic course information

Discipline's code	Discipline's title	Type	No. of hours per week			Number of credits	ECTS
			Lect.	Pract.	Lab		
MiF1202	Morphology and human physiology	CD OC	5	6	0	11	11
Lecturer, e-mail, contact number	Aytaliev Serik, aitaliyev.serik@med-kaznu.com, 87071598767			Office hours	According to the schedule		
Teachers of Anatomy and Physiology, e-mail, contact number	Aitbayeva Elmira, aitbayeva.elmira@medkaznu.com, +7012941817			Office hours	According to the schedule		
Academic presentation of the course	Course type: basic discipline of the university component, "Body structure and function in norm and pathology" module. The concepts of anatomy and physiology are exemplified by medical cases so as to engage students in analytical thinking, and promote independent, as well as collaborative, work on the study material.						

	<p>The aim of the course: to teach how to apply knowledge of morphology (anatomy and histology) and physiology of organs and systems of the human body (respiratory, cardiovascular, hematopoietic, digestive, urinary, reproductive, endocrine, musculoskeletal and skin as an organ, nervous, sensory organs) in age and the sexual aspect of human organ systems for understanding vital processes and maintaining homeostasis.</p> <p>Learning outcomes of discipline. During the study of the discipline students will learn following aspects:</p> <ol style="list-style-type: none"> 1. Know structural and organizational structure of internal organs, localize and describe, using appropriate terminology correctly, on models, preparations and medical imaging materials, the typical structure of internal organs and organs is normal, taking into account age, sex and individual characteristics; 2. Understand the functional organization of human body at the systemic, organ and cellular level, the physiological processes of excitable tissues; 3. Explain the interrelation of structure and function at the level of tissue, organs and organ systems and the main physiological mechanisms for maintaining homeostasis, vital activity of the organism and their characteristics, taking into account age, sexual and individual differences; 4. Recognize microscopic specimens and describe correctly using the appropriate terminology the microscopic structure of human organs, taking into account age, sex and individual characteristics; 5. Describe, using appropriate terminology, the stage of human development and explain the basic processes and mechanisms of normal morphogenesis; 6. Integrate knowledge about the structure of the musculoskeletal system and internal organs at the systemic, organ and tissue levels and their phylogenetic development in order to understand the anatomical and physiological features in different periods of development in normal conditions 7. Demonstrate commitment to the highest standards of professional responsibility and honesty; comply with ethical principles in all professional interactions; 8. To demonstrate the need for continuous professional training and improvement of their knowledge and skills; 9. To demonstrate the skills of conducting scientific research, the desire for new knowledge and the transfer of knowledge to others
Prerequisites	-
Postrequisites	OP 2204 General pathology
Information	Basic literature:

resources	<ol style="list-style-type: none"> 1. Saladin, Kenneth S: Essentials of Anatomy & Physiology. (2018, McGraw-Hill Education) 2. Costanzo, Linda S.: BRS Physiology. Board Review Series.7 edition. -Wolters Kluwer Health, 2018.- 307p. - ISBN 1496367693, 9781496367693 3. Russell K. Hobbie, Bradley J. Roth: Intermediate Physics for Medicine and Biology. - Springer, 2015. - ISBN 3319126822, 9783319126821 4. Andersson D, Medical Terminology: The Best and Most Effective Way to Memorize, Pronounce and Understand Medical Terms: Second Edition, ISBN-13 : 978-1519066626, 2016 <p>Additional literature:</p> <ol style="list-style-type: none"> 1. Standring, Susan: Gray's Anatomy: The Anatomical Basis of Clinical Practice. - 41 Elsevier Limited, 2016 2. Elaine N. Marieb, Lori A. Smith: Human Anatomy & Physiology Laboratory Manual, Main Version. - 11 edition. - Pearson Education,2015. - ISBN 9780133999143 3. Scanlon V. C, Essentials of Anatomy and Physiology 8th Edition, F.A. Davis Company, 2018 4. Victor P. Eroschenko, Atlas of Histology with Functional Correlations 13th Edition, LWW, 2017 5. William Bialek: Biophysics: Searching for Principles. -Princeton University Press, 2012. - ISBN 0691138915, 9780691138916 <p>Online resources:</p> <ol style="list-style-type: none"> 1. https://app.lecturio.com/#/ 2. https://3d4medical.com/ 3. https://www.youtube.com/channel/UCc_I2c2bUtO0p4DVeo6-Kxg 4. https://sites.google.com/a/umich.edu/bluelink/curricula/anatomy-403?authuser=0
Academic policy of the course in the context of university moral and ethical values	<p>CLASSES ATTENDANCE</p> <p>Students of Al-Farabi Kazakh National University must attend all types of academic sessions in accordance with the approved schedule. It is not allowed to miss classes without an acceptable reason, proved by suitable documents. Students of Al-Farabi Kazakh National University must attend all types of academic sessions in accordance with the approved schedule. It is not allowed to miss classes without an acceptable reason, proved by suitable documents. Students who have missed classes without a valid reason for more than 5 weeks are subject to expulsion from the university for violating the rules of the university's academic policy. Students who do not attend training sessions for more than 5 weeks due to illness must inform their advisor and instruct a trusted person to issue an academic leave for health reasons. If a student misses more than 50% of study sessions on a discipline, he/she is automatically graded "F" ("unsatisfactory") and is not allowed to the final assessment on the discipline.</p> <p>ASSESSMENT OF EDUCATIONAL ACHIEVEMENTS OF STUDENTS</p>

To assess educational achievements of students (achievement of expected learning outcomes), there are following types of control of students' academic performance: – ongoing assessment; – interim examination (RK1,RK2); – midterm examination (MT); – final assessment (final exam). Grade points of the interim examination reflect cumulative total assessment of current academic performance of the student (according to the grades indicated in the attendance list) and results of performance of special tasks of interim examination. The maximum level of academic performance for interim and midterm examinations on the discipline is 100 grade points for each interim examination and for midterm examination, including the results of ongoing assessment. Students who have scored at least 50 grade points ($IE1 + MT + IE2 / 3$) are admitted to the final assessment of their academic performance. The maximum grade for the final exam is 100 grade points. Admission to the examination session is issued by order of the dean of the faculty. It is not allowed to change the results of interim and midterm examinations to increase them. To the final examination are not admitted: – students who scored less than 50 points based on the results of interim examinations and MT ($IE1 + MT + IE2 / 3$); – students who missed more than 50% of classes on the discipline, regardless of documentary evidence; – students who have not submitted term papers (projects) on the relevant discipline; – students studying on contractual basis for provision of educational services, who have debts in payment of tuition fees.

ASSESSMENT OF LEARNING OUTCOMES, APPEAL, RETAKING OF EXAMS

Academic achievements of students (knowledge, abilities, skills and competencies) are assessed using the 100-point scale in grade points, corresponding to the internationally accepted alphabetic system with digital equivalents (positive grades, in decreasing order, from "A" to "D" (100-50), and “unsatisfactory” - “FX” (25-49), “F” (0-24), and to the grades of the traditional system. “FX” grade is used only for final examinations. The student, who does not agree with the result of the final assessment on the discipline (grade for the exam), has the right to submit a reasoned written application within three working days after the exam results are published in the electronic records sheet in the Univer system. Application for appeal is accepted, if the grade for the exam does not correspond to the objective level of learning outcomes demonstrated by this student: – due to the incorrect wording of the examination question; – due to the fact that the examination question's content does not correspond to the study program of the discipline; – due to the fact that the student's response was assessed incorrectly because of the lack of qualification of the members of examination committee. Appealed grade and reason for the appeal should be stated in the student's application. In the case of receiving the “unsatisfactory” grade corresponding to the “FX” mark (25-49), the student has the opportunity to retake the final assessment on a paid basis without repeated study of the whole program of the discipline / module. This should be done within the special period of time right after the examination session during which this grade was obtained. If the student gets the "F" grade as a result of re-taking the final exam, he/she should re-register for study of this discipline / module on a paid basis. He/she attends all study sessions, performs all types of academic activities according to the program of the discipline and retakes the final exam. If the student does not appear for a re-taking exam on the discipline for which he/she has been graded “FX”, this

	<p>grade will be transferred to the "F" ("unsatisfactory") and considered an academic debt. Then the student should attend in the next semester on a paid basis all types of study sessions, perform all types of academic work on this discipline according to the program, and take the final exam. Retaking the exam with an "FX" grade is allowed only once. . A student, who violates requirements of the Rules for conducting final assessment (that is using permitted supporting aids, mobile phones, being late for the exam without an acceptable reason, etc.), will get the "F" grade automatically, based on the record of violation, which is not subject to complain and appeal. In this case, the student should re-study this discipline on a paid basis. In the case of getting the "F" grade, the student has the right to repeat studying the discipline (Retake), but no more than two times. Repeated study of disciplines is carried out only on a paid basis.</p> <p>THE CODE OF PROFESSIONAL CONDUCT OF STUDENTS OF THE HIGHER SCHOOL OF MEDICINE OF THE FACULTY OF MEDICINE AND HEALTHCARE OF KAZNU, THE CODE OF HONOR OF KAZNU, THE REGULATIONS ON THE STUDENT OF KAZNU</p> <p>A student of KazNU strictly fulfills his academic duties, does not allow ethical, academic and legal violations, including: plagiarism; forgery; use of cheat sheets, cheating and hints at all stages of various forms of knowledge control; use of family or official ties to obtain a higher grades; bribery; cheating of a teacher and disrespectful attitude towards him; absenteeism and tardiness without a valid reason. A student of KazNU takes care of the safety of the property of KazNU and suppresses vandalism on its territory. In case of illegal actions, appropriate disciplinary penalties will be applied.</p>
<p>Evaluation and attestation policy</p>	<p>Criteria assessment: assessment of learning outcomes in relation to descriptors, verification of the formation of competencies (learning outcomes specified in the goal) is carried out by the following methods:</p> <ol style="list-style-type: none"> 1) testing using video, drawings, photographs, diagrams, microphotographs or OSPE using dummies and micropreparations - as part of the current / midterm / final control: final results No. 1, 3; 2) solution of situational problems, analysis of cases - within the framework of the current / midterm / final control - final results No. 2, 4, 5, 6, 9; 3) interview / oral interview - within the framework of the current / interim, midterm examination/ final control - final results No. 2, 4, 5, 6; 4) assessment by direct observation in the framework of current control and CDS - final results No. 7, 8, 9; <p>Summary assessment:</p> <p>In the course, 3 current controls are planned, within the framework of which the development of the material of one section is evaluated.</p> <p>For the semester, admission rating points are set: $AR = (IE1 + MT (Mid-Term) + IE2) / 3$, where $IE1 / IE2 / MT$ = the sum of all points for classes + points for interim/midterm examination control and IWS of the corresponding period**. $IE1$ - 1-5 weeks, MT - 6-10 weeks, $IE2$ - 11-15 weeks. The final control (exam) is carried out in 2 stages. The first stage is testing</p>

	<p>or OSPE*** (50%), the second stage is an oral survey of tickets (50%). The final grade for the discipline = AR* 0.6 + Exam * 0.4</p> <p>**AR-admission rating, IE - interim examination, MT - midterm examination, IWS - independent work of student ***Objective Structured Practical Exam - students passing stations in the number from 5 to 10 in accordance with the topics submitted for the current / milestone / final controls for a limited time.</p>
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Calendar (schedule) of the implementation of the course content

Week	Lesson	Topic title (lectures, practical classes, independent work of students with a teacher)	Number of hours	Max. Grade
1	1	Lecture 1 Introduction to anatomy and physiology Anatomical Position; Anatomical Planes; Directional Terms; Major Body Regions (Axial and Appendicular Region); Body Cavities and Membranes; Organ Systems.	2	
	2	Lecture 2 The integumentary system Structure and functions of the skin; Structure and functions of the Cutaneous Glands, Dermal circulation.	1	
	3	Lecture 3 The skeletal system I Overview of skeletal system and Osseous Tissue; Gross Anatomy of Bones; Bone Development and Metabolism	2	

	4	Practical lesson 1 Introduction to anatomy and physiology Anatomical Position; Anatomical Planes; Directional Terms; Major Body Regions (Axial and Appendicular Region); Body Cavities and Membranes; Organ Systems.	2	2
	5	Practical lesson 2 The integumentary system Structure and functions of the skin; Structure and functions of the Cutaneous Glands, dermal circulation;	2	2
	6	Practical lesson 3 The skeletal system I Overview of skeletal system and Osseous Tissue; Gross Anatomy of Bones; Bone Development and Metabolism	2	2
		IWST: Consultation on the implementation of IWS 1	3	
2	7	Lecture 4 The skeletal system II Bones associated with the Skull (Cranial and Facial Bones)	2	
	8	Lecture 5 The skeletal system III The Vertebral Column, The Thoracic Cage.	1	
	9	Lecture 6 The skeletal system IV The pectoral girdle and upper limb; The pelvic girdle and lower limb.	2	
	10	Practical lesson 4 The skeletal system II Bones associated with the Skull (Cranial and Facial Bones)	2	2

	11	Practical lesson 5 The skeletal system III General Features of the Vertebral Column, General Structure of a Vertebra, Intervertebral Discs; Regional Characteristics of Vertebrae, Thoracic Cage.	2	2
	12	Practical lesson 6 The skeletal system IV The pectoral girdle ; The upper limbs.	2	2
		IWST: Consultation on the implementation of IWS 1	3	
3	13	Lecture 7 Joint Joints and Their Classification;Jaw and knee joints;	2	
	14	Lecture 8 The muscular system I The Functions of Muscles; The Nerve–Muscle Relationship;	1	
	15	Lecture 9 The muscular system II Physiology of Skeletal Muscle, Cardiac muscle and smooth muscle	2	
	16	Practical lesson 7 The skeletal system V The pelvic girdle ;The lower limbs	2	2
	17	Practical lesson 8 Joint Joints and Their Classification Jaw and knee joints;	2	2

	18	Practical lesson 9 The muscular system I The Functions of Muscles; The Nerve–Muscle Relationship; Physiology of Skeletal Muscle, Cardiac and Smooth Muscle.	2	2
		IWST: Consultation on the implementation of IWS 1	3	
4	19	Lecture 10 The muscular system II Muscles of the facial expression, head and neck	2	
	20	Lecture 11 The muscular system III Muscles of the trunk; Muscles Acting on the Shoulder.	1	
	21	Lecture 12 The muscular system IV Muscles of the Arm; Muscles Acting on the Forearm, the Wrist and Hand	2	
	22	Practical lesson 10 The muscular system II General Aspects of Muscle Anatomy; Muscles of the facial expression, head and neck	2	2
	23	Practical lesson 11 The muscular system III Muscles of Respiration ; Muscles of the trunk	2	2
	24	Practical lesson 12 The muscular system IV Muscles Acting on the Shoulder and Arm; Muscles Acting on the Forearm, the Wrist and Hand	2	2
			IWST: Consultation on the implementation of IWS 1	3

5	25	Lecture 13 The muscular system V Muscles Acting on the Hip and Femur; Muscles Acting on the Knee	2	
	26	Lecture 14 Muscles Acting on the Leg, Foot, Intrinsic Muscles of the Foot	1	
	27	Lecture 15 The muscular system V Whole-Muscle Contraction; Muscle metabolism	2	
	28	Practical lesson 13 The muscular system V Muscles Acting on the Hip and Femur; Muscles Acting on the Knee	2	2
	29	Practical lesson 14 The muscular system VI Muscles Acting on the Leg, Foot, Intrinsic Muscles of the Foot	2	2
	30	Practical lesson 15 Whole-Muscle Contraction; Muscle Metabolism	2	2
6	31	Lecture 16 Circulatory system Blood I Introduction, Blood Types; Erythrocytes; Leukocytes.	2	
	32	Lecture 17 Platelets; Hemostasis.	1	
	33	Lecture 18 Circulatory system Heart I Overview of the Cardiovascular System; Systematic and pulmonary circuit;Gross Anatomy of the heart	2	

	34	Practical lesson 16 Circulatory system Blood I Introduction to the circulatory system; Erythrocytes Blood Types	2	2
	35	Practical lesson 17 Circulatory system Blood II Leukocytes Platelets and Hemostasis, The Control of Bleeding	2	2
	36	Practical lesson 18 Circulatory system Heart Overview of the Cardiovascular System. Systematic and pulmonary circuit Gross Anatomy of the heart	2	2
		IWST: Consultation on the implementation of IWS 2	3	
7	37	Lecture 19 Circulatory system Heart III Cardiac Muscle and the Cardiac Conduction System Electrical and Contractile Activity of the Heart	2	
	38	Lecture 20 Circulatory system Heart II Cardiac cycle and heart sound Cardiac output	1	

	39	Lecture 21 Circulatory system - Vessels General Anatomy of the Blood Vessels Capillary Exchange. Physiology of Circulation	2	
	40	Practical lesson 19 Circulatory system Heart III Cardiac Muscle and the Cardiac Conduction System Electrical and Contractile Activity of the Heart	2	2
	41	Practical lesson 20 Circulatory system Heart III Cardiac cycle and heart sound; Cardiac output	2	2
	42	Practical lesson 21 Circulatory system -Vessels and circulation I General Anatomy of the Blood Vessels ; Physiology of Circulation Current control-1	2	55
		IWS with teacher: Presentation of IWS 1 IWST: Passing the IWS 1 –«The role of facial muscles in various facial expressions» - work in groups.	3	5
		Interim examination 1		100
8	43	Lecture 22 Circulatory system -Vessels and circulation II Circulatory Routes and Blood Vessels of Axial and Appendicular Region	2	
	44	Lecture 23 The Lymphatic System and Immune System	1	

	45	Lecture 24 The Respiratory System I General Anatomy of the Respiratory System	2	
	46	Practical lesson 22 Circulatory system Blood vessels and circulation II Anatomy of the Pulmonary Circuit Systemic Vessels of the Axial Region	2	2
	47	Practical lesson 23 Circulatory system Blood vessels and circulation II Anatomy of the Systemic Vessels of the Appendicular Region	2	2
	48	Practical lesson 24 The lymphatic and immune system The Lymphatic System ; Overview of immune system	2	2
		IWST: Consultation on the implementation of IWS 2	3	
9	49	Lecture 25 The Respiratory System II Pulmonary Ventilation	2	
	50	Lecture 26 The Respiratory System III Gas Exchange and Transport	1	
	51	Lecture 27 The Urinary System I Functions of the Urinary System Anatomy of the Urinary system	2	

	52	Practical lesson 25 The Respiratory System I General Anatomy of the Respiratory System	2	2
	53	Practical lesson 26 The Respiratory System II Pulmonary Ventilation Gas Exchange and Transport	2	2
	54	Practical lesson 27 The Urinary System I Functions of the Urinary System Anatomy of the Kidney, ureters, urinary bladder, and urethra	2	2
		IWST: Consultation on the implementation of IWS 2	3	
10	55	Lecture 28 The Urinary System II Urine Formation I: Glomerular Filtration	2	
	56	Lecture 29 The Urinary System II Urine Formation II: Tubular Reabsorption and Secretion Urine Formation III: Water Conservation	1	
	57	Lecture 30 Fluid Balance Electrolyte Balance Acid Base Balance	2	

	58	Practical lesson 28 The Urinary System II Urine Formation I: Glomerular Filtration	2	2
	59	Practical lesson 29 Fluid, electrolyte and acid balance Urine Formation II:Tubular Reabsorption and Secretion Urine Formation III: Water Conservation	2	2
	60	Practical lesson 30 Fluid Balance Electrolyte Balance Acid Base Balance	2	2
		IWST Consultation and feedback on difficult topics	3	
11	61	Lecture 31 The digestive system I Nutrition Metabolic States and Metabolic Rate	2	
	62	Lecture 32 The digestive system I General Anatomy and Digestive Processes The Mouth Through Esophagus The Stomach	1	
	63	Lecture 33 The digestive system II The Liver, Gallbladder, and Pancreas The Small Intestine and Large Intestine	2	

	64	Practical lesson 31 Nutrition and Metabolism Nutrition; Metabolic States and Metabolic Rate	2	2
	65	Practical lesson 32 The digestive system I General Anatomy and Digestive Processes ; The Mouth Through Esophagus	2	2
	66	Practical lesson 33 The digestive system II The Stomach The Liver, Gallbladder, and Pancreas	2	2
		IWST Consultation and feedback on difficult topics	3	
12	67	Lecture 34 The digestive system III Chemical Digestion and Absorption	2	
	68	Lecture 35 The Nervous System Overview of nervous system; The basic structure and Physiology of Neurons	1	
	69	Lecture 36 The Nervous System-The Spinal Cord I The Spinal Cord ; The Spinal nerves ; Somatic Reflexes	2	
	70	Practical lesson 34 The digestive system III The Small Intestine and Large Intestine ; Chemical Digestion and Absorption	2	2
	71	Practical lesson 35 The Nervous System I Overview of nervous system	2	2

		The basic structure and Physiology of Neurons		
	72	Practical lesson 36 The Nervous System -The Spinal Cord I The Spinal Cord The Spinal nerves Somatic Reflexes	2	2
		IWST Consultation and feedback on difficult topics	3	
13	73	Lecture 37 The Nervous System- Brain I Overview of the brain	2	
	74	Lecture 38 The nervous System - Brain II Principal Divisions of the Brain	1	
	75	Lecture 39 Integrative Functions of the Brain The Cranial Nerves	2	
	76	Practical lesson 37 The nervous System - Brain I Overview of the brain	2	2
	77	Practical lesson 38 The nervous System - Brain II Principal Divisions of the Brain	2	2

	78	Practical lesson 39 The nervous System - Brain III Multiregional Brain Functions The Cranial Nerves	2	2
		IWST Consultation and feedback on difficult topics	3	
14	79	Lecture 40 The nervous System The Autonomic Nervous System	2	
	80	Lecture 41 The Endocrine System I Overview of the Endocrine System Hormones and Their Actions	1	
	81	Lecture 42 The Endocrine System II The Hypothalamus and Pituitary Gland ; Other Endocrine Glands	2	
	82	Practical lesson 40 The Autonomic Nervous System	2	2
	83	Practical lesson 41 The Endocrine System I Overview of the Endocrine System Endocrine Physiology	2	2
	84	Practical lesson 42 The Endocrine System II The Hypothalamus and Pituitary Gland Other Endocrine Glands	2	2

		IWST Consultation and feedback on difficult topics	3	
15	85	Lecture 43 Sense organs Properties and Types of Sensory Receptors The General Senses; The Chemical Senses organs	2	
	86	Lecture 44 The Male Reproductive System Male Reproductive Anatomy Male reproductive physiology	1	
	87	Lecture 45 The Female Reproductive System Female Reproductive Anatomy Female reproductive physiology	2	
	88	Practical lesson 43 The sense organs Receptors and Sensations The General Senses Chemical sensation -taste	2	2
	89	Practical lesson 44 The Reproductive System The male and female reproductive system	2	2
	90	Practical lesson 45 Current control-2	2	49
		IWS with teacher Presentation of IWS "Nerve blocks of the face"	3	5

		Interim examination 2		100
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