



INTEGRATED ACADEMIC STUDIES OF PHARMACY

FIRST YEAR OF STUDIES

school year 2023/2024.

FUNDAMENTALS OF HUMAN PHYSIOLOGY

Subject:

FUNDAMENTALS OF HUMAN PHYSIOLOGY

The course is evaluated with 5 ECTS. There are 6 active classes per week (4 classes of lectures and 2 classes of small group activities).

TEACHERS AND ASSOCIATES:

No	Name and surname	E-mail address	Title
1.	Vladimir Jakovljević	drvladakbg@yahoo.com	Full professor
2.	Gvozden Rosic	grosic@medf.kg.ac.rs	Full professor
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9.	Maja Murić	majanikolickg90@gmail.com	Assistant
10.	Marina Nikolić	marina.rankovic.95@gmail.com	Assistant
11.	Jovan Milosavljević	jovan.milosavljevic1997@gmail.com	Facilitator

COURSE STRUCTURE:

Name of the subject	Classes per week	Lectures	Work in a small group	Teacher - manager subject
Fundamentals of human physiology	6	4	2	Prof. Ivan Srejović

ASSESSMENT:

The grade is equivalent to the number of points won (see tables). Points are earned in two ways:

ACTIVITY DURING THE LESSON: In this way, the student can gain up to 15 points, by answering two exam questions from that week's lesson in a special part of the small group activity, and in accordance with the shown knowledge, he receives 0-1 point.

MODULE TEST: In this way, the student can earn up to 35 points according to the attached table.

Number of correct answers	Number of points
0-35	0
36-70	Number of correct answers/2

As part of pre-exam activities, a student can earn a maximum of 50 points.

ORAL EXAM: In this way, a student can gain 50 points by answering one question from 5 different areas (physiology of excitable tissues, physiology of the cardiovascular system, acid-base balance and digestive system, physiology of the endocrine system, physiology of the nervous system and senses), for which scores points from 1 to 10 for each exam question. A score of 0 on any question represents the end of the exam.

A student has the right to take an oral exam if he has achieved more than 50% of points in all pre-exam activities.

The final grade is formed as follows:

In order to pass the course, the student must pass the pre-exam activities and the oral exam. The final grade is formed according to the attached table.

number of points won	rating
0 - 50	5
51 - 60	6
61 - 70	7
71 - 80	8
81-90	9
91 - 100	10

LITERATURE:

MODULE	TITLE OF THE TEXTBOOK	THE AUTHORS	PUBLISHER	THE LIBRARY
FUNDAMENTALS OF HUMAN PHYSIOLOGY	Ganong's Review of Medical Physiology, first edition in Serbian.	Ganong William.		Has
	MEDICAL PHYSIOLOGY	Guyton AC, Hall JE.		Has

All lectures and material for small group work are available on the website of the Faculty of Medical Sciences: www.medf.kg.ac.rs

THE PROGRAM:

TEACHING UNIT 1 (FIRST WEEK):

GENERAL PRINCIPLES OF HUMAN PHYSIOLOGY

lectures - 4 classes	small groups activities - 2 classes
Review of Cell Physiology in Medical Physiology. Homeostasis. Transport through the cell membrane.	Basic principles of work in the laboratory.

TEACHING UNIT 2 (SECOND WEEK):

EXCITABLE TISSUES: NERVE AND MUSCLE. TRANSMISSION AT SYNAPSES AND JOINTS

lectures - 4 classes	small groups activities - 2 classes
Physiology of excitable tissues. Membrane potentials. Excitation and execution of action potentials. Neuromuscular transmission. Excitation and contraction of skeletal and smooth muscle.	Disorders of neuromuscular transmission.

TEACHING UNIT 3 (THIRD WEEK):

PHYSIOLOGY OF THE HEART

lectures - 4 classes	small groups activities - 2 classes
Physiology of the heart. Electrical activity of the heart and impulse conduction. Cardiac cycle. Regulation of the heart.	Electrocardiography

UNIT 4 (FOURTH WEEK):

PHYSIOLOGY OF THE CIRCULATORY SYSTEM

lectures - 4 classes	small groups activities - 2 classes
Physiology of the circulatory system. Biophysical characteristics of circulation. Circulation in arteries, capillaries and veins. Lymph and lymphatic vessels. Regulation of circulation.	Arterial pulse. Arterial blood pressure.

UNIT 5 (FIFTH WEEK):

PHYSIOLOGY OF THE RESPIRATORY SYSTEM

lectures - 4 classes	small groups activities - 2 classes
Physiology of the respiratory system. Breathing mechanics. Diffusion, exchange and transport of gases. Regulation of breathing.	Spirometry.

UNIT 6 (SIXTH WEEK):

BLOOD PHYSIOLOGY

lectures - 4 classes	small groups activities - 2 classes
Blood physiology. Bone marrow. Erythrocytes. Leukocytes. Platelets. Blood groups. Plasma and plasma proteins. Hemostasis.	Determination of blood groups in the ABO system.

UNIT 7 (SEVENTH WEEK):

KIDNEY PHYSIOLOGY

lectures - 4 classes	small groups activities - 2 classes
Kidney physiology. Functional morphology of the kidney. Renal circulation. Glomerular filtration. Tubule function. Counter current mechanism. Regulation of water and electrolyte excretion. Regulation of composition and volume of extracellular fluid. The role of the kidneys in the regulation of pH values.	Renal clearances.

UNIT 8 (EIGHTH WEEK):

PHYSIOLOGY OF THE GASTROINTESTINAL SYSTEM

lectures - 4 classes	small groups activities - 2 classes
Physiology of the digestive system. Functional morphology of the gastrointestinal system. Basic types of movement of the gastrointestinal tract. Gastrointestinal secretion. Digestion and absorption of carbohydrates. Digestion and absorption of proteins and nucleic acids. Digestion and absorption of lipids.	Disorders of secretion in the digestive tract.

UNIT 9 (NINTH WEEK):

METABOLISM AND NUTRITION

lectures - 4 classes	small groups activities - 2 classes
Basic principles of nutrition and metabolism. Liver function.	The basic principles of composing a daily meal.

UNIT 10 (TENTH WEEK):

BASIC PRINCIPLES OF ENDOCRINE REGULATION 1

lectures - 4 classes	small groups activities - 2 classes
Basic principles of endocrine regulation. Hypothalamic hormones. Pituitary. Thyroid gland. Adrenal glands.	Tests to assess thyroid function.

UNIT 11 (ELEVENTH WEEK):

BASIC PRINCIPLES OF ENDOCRINE REGULATION 2

lectures - 4 classes	small groups activities - 2 classes
Regulation of calcium and phosphorus metabolism. Hormones of the endocrine pancreas. Physiology of the female reproductive system. Physiology of the male reproductive system.	Tests for evaluation of glycoregulation. Tests for early diagnosis of pregnancy.

UNIT 12 (Twelfth Week):

PHYSIOLOGY OF THE NERVOUS SYSTEM 1

lectures - 4 classes	small groups activities - 2 classes
Physiology of the sensory nervous system.	Examination of sensory functions.

UNIT 13 (THIRTEENTH WEEK):

PHYSIOLOGY OF THE NERVOUS SYSTEM 2

lectures - 4 classes	small groups activities - 2 classes
Motor and integrative functions of the nervous system.	Examination of clinically important reflexes

UNIT 14 (FOURTEENTH WEEK):

PHYSIOLOGY OF THE NERVOUS SYSTEM 3

lectures - 4 classes	small groups activities - 2 classes
Autonomic nervous system. The limbic system and higher brain functions. Wake-sleep cycle.	Autonomic reflexes.

UNIT 15 (FIFTEENTH WEEK):

PHYSIOLOGY OF THE SENSES

lectures - 4 classes	small groups activities - 2 classes
Physiology of the senses. Eyesight. Sense of hearing. Sense of taste. Sense of smell.	Examination of the sense of sight: Determination of the nearest and farthest point of clear vision. Determination of visual acuity. Examination of the quality of color vision. Determining the width of the field of view using the perimeter. Proving the existence of the blind spot (Marriott's experiment).

LECTURE SCHEDULE

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SCHEDULE OF SMALL GROUP ACTIVITIES

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Schedule of classes and module tests

week	type	method unit name	a teacher
1	L	Review of Cell Physiology in Medical Physiology. Homeostasis. Transport through the cell membrane.	Ivan Srejšović
1	SGA	Basic principles of work in the laboratory.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejšović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević
2	L	Physiology of excitable tissues. Membrane potentials. Excitation and execution of action potentials. Neuromuscular transmission. Excitation and contraction of skeletal and smooth muscle.	Ivan Srejšović
2	SGA	Disorders of neuromuscular transmission.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejšović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević
3	L	Physiology of the heart. Electrical activity of the heart and impulse conduction. Cardiac cycle. Regulation of the heart.	Vladimir Jakovljević

week	type	method unit name	a teacher
3	SGA	Electrocardiography	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević
4	L	Physiology of the circulatory system. Biophysical characteristics of circulation. Circulation in arteries, capillaries and veins. Lymph and lymphatic vessels. Regulation of circulation.	Gvozden Rosić
4	SGA	Arterial pulse. Arterial blood pressure.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević
5	L	Physiology of the respiratory system. Breathing mechanics. Diffusion, exchange and transport of gases. Regulation of breathing.	Gvozden Rosić
5	SGA	Spirometry.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević

week	type	method unit name	a teacher
6	L	Blood physiology. Bone marrow. Erythrocytes. Leukocytes. Platelets. Blood groups. Plasma and plasma proteins. Hemostasis.	Vladimir Živković
6	SGA	Determination of blood groups in the ABO system.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejšović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević
7	L	Kidney physiology. Functional morphology of the kidney. Renal circulation. Glomerular filtration. Tubule function. Counter current mechanism. Regulation of water and electrolyte excretion. Regulation of composition and volume of extracellular fluid. The role of the kidneys in the regulation of rN values.	Suzana Pantović
7	SGA	Renal clearances.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejšović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević
8	L	Physiology of the digestive system. Functional morphology of the gastrointestinal system. Basic types of movement of the gastrointestinal tract. Gastrointestinal secretion. Digestion and absorption of carbohydrates. Digestion and absorption of proteins and nucleic acids. Digestion and absorption of lipids.	Jovana Joksimović Jović

week	type	method unit name	a teacher
8	SGA	Disorders of secretion in the digestive tract.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejšović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević
9	L	Basic principles of nutrition and metabolism. Liver function.	Jovana Joksimović Jović
9	SGA	The basic principles of composing a daily meal.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejšović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević
10	L	Basic principles of endocrine regulation. Hypothalamic hormones. Pituitary. Thyroid gland. Adrenal glands.	Suzana Pantović
10	SGA	Tests to assess thyroid function.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejšović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević

week	type	method unit name	a teacher
11	L	Regulation of calcium and phosphorus metabolism. Hormones of the endocrine pancreas. Physiology of the female reproductive system. Physiology of the male reproductive system.	Ivan Srežović
11	SGA	Tests for evaluation of glycoregulation. Tests for early diagnosis of pregnancy.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srežović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević
12	L	Physiology of the sensory nervous system.	Dragica Selaković
12	SGA	Examination of sensory functions.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srežović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević
13	L	Motor and integrative functions of the nervous system.	Dragica Selaković

week	type	method unit name	a teacher
13	SGA	Examination of clinically important reflexes.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejšović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević
14	L	Autonomic nervous system. The limbic system and higher brain functions. Wake-sleep cycle.	Dragica Selaković
14	SGA	Autonomic reflexes.	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejšović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević
15	L	Physiology of the senses. Eyesight. Sense of hearing. Sense of taste. Sense of smell.	Jasmina Sretenović
15	SGA	Examination of the sense of sight: Determination of the nearest and farthest point of clear vision. Determination of visual acuity. Examination of the quality of color vision. Determining the width of the field of view using the perimeter. Proving the existence of the blind spot (Marriott's experiment).	Vladimir Jakovljević Gvozden Rosić Suzana Pantović Vladimir Živković Ivan Srejšović Dragica Selaković Jovana Joksimović Jović Jasmina Sretenović Maja Murić Marina Nikolić Jovan Milosavljević

week	type	method unit name	a teacher
FINAL TEST			
E	EXAM (JUNE DEADLINE)		