Assessment tools for certification
in the discipline "Physiology"
for students of the educational program
specialist degree
in the specialty 33.05.01 Pharmacy,
direction (profile) Pharmacy,
form of study full-time
for the 2023-2024 academic year

1. Assessment tools for certification in the discipline

Current certification includes the following types of tasks: testing, situational tasks, interviews on control questions.

1.1. Examples of test tasks

Verified indicators of achievement of competence: UC-1.1.3, UC -1.2.1, UC -1.2.2, UC -1.2.3, UC -1.3.1, UC -7.1.1, UC -8.1.2, OPC-2.2.1, PC-3.1.1.

1. Excitable tissue is
a) nerve tissue
b) bone tissue
c) fibrous tissue
d) cartilage tissue

2. Rheobase is
a) the minimum current strength that must act for a certain time to cause excitation
b) the minimum time during which the threshold current must operate to cause excitation
c) the magnitude of the current is less than the threshold of irritation, not capable of causing excitation

3. The phase of supernormal excitability occurs during...
a) subthreshold potential
b) peak potential
c) negative trace potential
d) positive trace potential

4. The following fiber has the greatest lability...
a) type A
b) type B
c) type C
d) the same.

5. The lability of type B nerve fiber is...
a) 2000
b) 300
c) 4
d) less than 1

6. The main properties of the dominant are:
a) duration of excitation
b) persistence of excitation
c) inertia
d) occlusion

7. The importance of the central nervous system for the body is that:
a) The central nervous system provides communication between various organs and systems
b) The central nervous system communicates the body with the external environment
c) the central nervous system carries out the processes of consciousness and thinking
d) The central nervous system regulates the functioning of internal organs

8. Tidal volume is
a) the volume of normal exhalation after normal inhalation
b) the volume of air in the chest cavity during quiet breathing
c) the volume of air present in the airways during quiet breathing
d) the volume of air that remains in the lungs after a quiet exhalation

9. The main physiological properties of the heart muscle are...
a) excitability, conductivity, contractility, plasticity
b) automaticity, excitability, conductivity, contractility, refractoriness
c) automaticity, excitability, refractoriness, contractility
d) plasticity, elasticity, excitability, conductivity, automaticity

10. Systole is...
a) heart contraction
b) relaxation of the heart
c) single cardiac cycle
d) pause between heart contractions

1.2. Examples of situational tasks
Verified indicators of achievement of competence: UC-1.1.3, UC-1.2.1, PC-3.1.1.
Task 1

It is known that the conduction of excitation in a synapse consists of several stages. In the experiment, exposure to a chemical substance at neuromuscular synapses led to the cessation of the transmission of excitation from the nerve to the skeletal muscle. When acetylcholine was introduced into the indicated area, the conduction of excitation through the synapse was not restored. The introduction of the enzyme acetylcholinesterase restored the conduction of excitation.
Questions:
1. List the possible mechanisms for stopping the conduction of excitation in the synapse?
2. What is the mechanism of action of the studied substance on the neuromuscular synapse?

Task 2
It is known that there is an uneven distribution of ions around the cell membranes of excitable tissues. Experimentally the concentration gradient outside and inside the excitable cell separately for Na, K, Cl and Ca ions was increased.
Questions:
How will the magnitude of the resting potential and action potential change with an increase in the concentration gradient separately for the ions: 1) Na; 2) K; 3) CI; 4) Ca?

1.3. Examples of test questions for interviews

Verified indicators of achievement of competence: UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-7.1.1, UC-7.3.1, UC-8.1.1, UC-8.3.1, OPC-2.1 .1.
1. Pain analyzer: receptor, conduction and cortical departments.
2. Tactile analyzer: receptor, conductive and cortical departments.
3. Temperature analyzer: receptor, conductive and cortical departments.
4. Taste analyzer: receptor, conductive and cortical departments.
5. Olfactory analyzer: receptor, conductive and cortical departments.

2. Assessment tools for intermediate certification in the discipline

Intermediate certification is carried out in the form of an exam.

Intermediate certification includes the following types of tasks: interview.

2.1. List of interview questions

№	Questions to prepare for the intermediate certification	Verified indicators of achievement of competence
1.	Excitable tissues. General and particular properties of excitable tissues.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, OPC-2.1.1.
2.	Modern ideas about the structure and function of membranes. Ion channels, their classification and role. Transport of substances across biological membranes.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
3.	Bioelectric phenomena in living tissues. Resting membrane potential. Method of its registration.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.3.1, OPC-2.1.1, OPC-2.2.1.
4.	Excitation. Action potential, its phases.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
5.	Stimulus, classification. Types of electrical responses of excitable tissues (electrotonic potential, local response, action potential). The mechanism of their occurrence.	UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, OPC-2.1.1, OPC-

		2.3.1.
6.	Excitability and excitation. Changes in excitability during excitation.	UC-1.1.3, UC-1.2.1, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, OPC-2.1.1, OPC-2.2.1.
7.	Laws of irritation: the law of force, the all-or-none law and its relative nature.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
8.	The strength-duration law. The concept of utilization time, rheobase, chronaxy. Gradient law. Accommodation, speed of accommodation and its measure.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1.
9.	Polar law of irritation. Physiological electroton. Cathodal depression.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1.
10.	Receptors. Classification. The mechanism for converting stimulus energy into a nerve impulse. Properties of receptors.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-8.1.1, UC-8.1.2, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.

11.	Classification of nerve fibers. Spread of excitation along unmyelinated and myelinated nerve fibers. Laws of conduction of excitation along the nerve. Lability.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
12.	Classification of muscles. Functions and properties of skeletal muscles. Modes of skeletal muscle contractions (isotonic, isometric, auxotonic). Muscle strength. Factors affecting muscle strength. Average load rule.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1.
13.	Smooth muscles, their morphological and physiological features.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1.
14.	Single muscle contraction and its phases (muscle twitch). Summation of muscle contractions.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1.
15.	Tetanic contraction, types of tetanus.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-

		2.3.1.
16.	Contractile apparatus of muscle fiber. Ultramicroscopic structure of myofibrils at rest and during contraction . Contractile and regulatory proteins. Modern concept of the mechanism of muscle contraction and relaxation.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
17.	Synapse. Classification. Structure. Features of the transmission of excitation in the electrical synapse.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
18.	The mechanism of excitation transmission in a chemical synapse. Properties of chemical synapses.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
19.	Motor synapse (neuromuscular junction), structure. The mechanism of synaptic transmission. End plate potential.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
20.	Inhibitory synapses and their mediators. Features of	UC-1.1.3, UC-1.2.1,

	signal transmission.	UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
21.	Methods for studying the functions of the central nervous system.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1.
22.	Reflex. Classification of reflexes. Reflex arc and its analysis.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
23.	Nerve center. Basic properties of nerve centers.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1.
24.	Basic principles of coordination activity of nerve centers.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-

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25.	Central nerve inhibition. Basic functions of the inhibitory process. Types of inhibition in the central nervous system.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1.
26.	Primary and secondary inhibition. Mechanisms and significance.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
27.	Anatomical and functional features of the spinal cord. Conductor function. Reflex activity.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
28.	The cerebellum and its functions.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1.
29.	Midbrain. Reticular formation. Functions.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3,

		UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1.
30.	Diencephalon (thalamus, hypothalamus) and its functions.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
31.	Autonomic and somatic nervous systems, their anatomical and functional differences.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.2.1.
32.	Interaction of the sympathetic and parasympathetic divisions of the autonomic nervous system.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
33.	Structural and functional features of the sympathetic division of the autonomic nervous system.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1,

		OPC-2.2.1.
34.	Structural and functional features of the parasympathetic division of the autonomic nervous system	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
35.	Metasympathetic division of the autonomic (vegetative) nervous system.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
36.	Autonomic reflexes and centers for the regulation of autonomic functions.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
37.	Ways of pharmacological regulation of excitability, conductivity, lability. Parabiosis.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
38.	Neurotransmitter. Types of neurotransmitters. Properties of neurotransmitters. Pathways for removing neurotransmitters from the synaptic cleft.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1,

		UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
39.	Cholinergic receptors, their types, localization. Activators and blockers of cholinergic receptors. Effects of interaction between the neurotransmitter acetylcholine and cholinergic receptors.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
40.	Adrenergic receptors, their types, localization. Adrenergic receptor activators and blockers. Effects of interaction of noradrenaline with adrenoreceptors.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
41.	Ways of pharmacological regulation of synaptic transmission of excitation.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
42.	Inhibitory synapses, inhibitory neurotransmitter s and their receptors. The role of inhibitory synapses. Pharmacological blockade of inhibitory synapses.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1,

		UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
43.	Ways of pharmacological correction of the tone of nerve centers.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
44.	Structural organization of the autonomic nervous system. The influence of the autonomic nervous system on vital activity.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
45.	Cholinergic and adrenergic structures in the body. Pharmacological ways of modulating the work of autonomic synapsesв.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
46.	Biological role of endocrine regulation. Endocrine glands. Hormones. Classification of hormones.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-

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47.	The main ways of hormones influence. Antagonistic and synergistic effects of hormones.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
48.	Structural and functional organization of the endocrine system. Basic mechanisms of hormone action. Tissue spectrum of hormone action.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
49.	Hypothalamic-pituitary system, its functions. Pituitary gland and its hormones.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
50.	Sensory systems. General principles of analyzer structure. Basic functions and properties.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
51.	Auditory analyzer, structure, functioning.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1,

		UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1.
52.	Visual analyzer, structure, functioning.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1.
53.	Unconditioned and conditioned reflexes.Formation and biological significance of conditioned reflexes.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1.
54.	The doctrine of higher nervous activity. The role of I.P. Pavlov and I.M. Sechenov in the creation of the doctrine of HNA, its essence. The mechanism of formation of conditioned reflexes.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1, OPC-2.2.1.
55.	Inhibition of conditioned reflexes, its types and mechanisms.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1, OPC-2.2.1.
56.	Features of human higher nervous activity. Types of higher nervous activity. I and II signaling systems.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1,

		UC-8.3.1, OPC-2.2.1.
57.	Pain analyzer. Nociceptive and antinociceptive systems.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
58.	Ways of pain sensitivity correction.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
59.	Disorders of higher nervous activity.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
60.	Self-regulation of physiological functions. Homeostasis.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
61.	Respiration and its significance. Respiratory system.	UC-1.1.3, UC-1.2.1,

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62.	External respiration. The mechanism of inhalation and exhalation.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
63.	Gas exchange in the lungs and tissues.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1.
64.	Gas transport by blood. Oxygen capacity of blood.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1.
65.	The respiratory center and its automaticity.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-

		2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
66.	A functional system for maintaining blood gas composition in the body.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1.
67.	Regulation of respiration. Nervous and humoral mechanisms. The role of the receptor apparatus. Basic respiratory reflexes.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1.
68.	Internal environment of the body. Blood system. Blood functions.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
69.	Quantity and composition of blood. Blood functions. Composition of blood plasma.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
70.	Physicochemical properties of blood. Hemolysis and its types.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1,

		UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
71.	Red blood cells, quantity, functions. Hemoglobin, quantity, types, functions.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
72.	Leukocytes, quantity, types, functions. Leukocyte formula.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
73.	Platelets. Hemostasis. Coagulation and anticoagulation systems. Fibrinolysis.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
74.	Blood types and Rh factor. Rules for blood transfusion.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.

75.	Blood replacement solutions, their types.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
76.	Heart, structure, functions. Factors providing the blood flow in the correct direction.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1.
77.	Lymphatic and microcirculatory bed. Circulation circles.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1.
78.	Cardiac cycle, its periods and phases.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
79.	Properties of the heart muscle. Automation. Conduction system of the heart.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1.

80.	Electrical processes of the heart muscle. Action potential of the conduction system and working myocardium.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
81.	Intracardiac regulation. Cellular, intercellular and intracardiac mechanisms	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
82.	Innervation of the heart. The influence of sympathetic and parasympathetic nerves on the heart.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
83.	Cardiovascular center.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
84.	Extracardiac regulation of heart activity.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1.

85.	The vascular system in the body, its main functions. Classification of blood vessels.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1.
86.	Hemodynamics. Factors that determine the movement of blood through the blood vessels. Basic hemodynamic parameters.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
87.	Neurogenic mechanisms of regulation of vascular tone.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
88.	Humoral regulation of cardiac activity.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
89.	Blood pressure and factors influencing its value. Blood pressure in different parts of the vascular system.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1,

		OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
90.	Humoral regulation of vascular tone.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
91.	General characteristics of digestion, digestive organs and functions of the gastrointestinal tract.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
92.	Digestion in the oral cavity. Saliva, composition, regulation of salivation.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
93.	Types of digestion. Cavity and membrane digestion. Absorption.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.

94.	Motility of the gastrointestinal tract.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.3.1.
95.	Digestion in the stomach. Composition and properties of gastric juice. Regulation of gastric secretion. Adaptive nature of the secretory activity of the stomach.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.3.1.
96.	Digestion in the duodenum. The role of the liver and pancreas in the digestive process.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
97.	Liver, its structure, functions.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
98.	Participation of bile in digestion, its composition.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3,

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99.	Properties and composition of intestinal juice. Regulation of intestinal secretion.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1.
100.	Excretory organs and their significance. Kidneys, functions, structure.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1.
101.	The structure of the nephron and features of its blood supply.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1.
102.	The process of urine formation.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.

103.	Glomerular ultrafiltration.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1, PC-3.3.1.
104.	Tubular reabsorption and secretion.	UC-1.1.3, UC-1.2.1, UC-1.2.2, UC-1.2.3, UC-7.1.1, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, OPC-2.2.1, OPC-2.3.1, PC-3.1.1, PC-3.2.1.
105.	Regulation of renal activity.	UC-1.1.3, UC-1.2.1, UC-1.2.3, UC-7.2.1, UC-7.3.1, UC-8.1.1, UC-8.1.2, UC-8.2.1, UC-8.3.1,OPC-2.1.1, PC-3.1.1.

The full fund of assessment tools for discipline / practice is available in the EIES of VolgSMU at the link (s):

https://elearning.volgmed.ru/course/view.php?id=6943

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