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FACULTY OF PHARMACY

STUDY PROGRAM 0916.1 PHARMACY

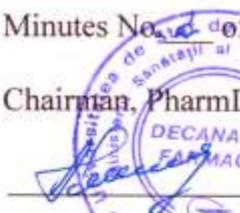
Department of Human anatomy

APPROVED

at the meeting of the Commission for Quality Assurance and Evaluation of the Curriculum Faculty of Pharmacy

Minutes No. 01 of 21.12.2017

Chairman, PharmD, associate professor

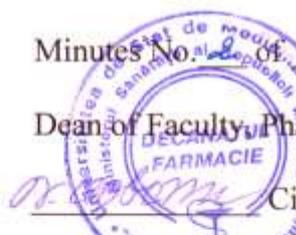

Uncia Livia

APPROVED

at the Council meeting of the Faculty of Pharmacy

Minutes No. 02 of 22.12.2017

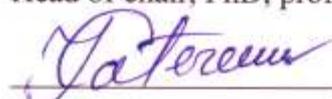
Dean of Faculty, PharmD, associate professor


Ciobanu Nicolae

APPROVED

at the meeting of the chair of Human Anatomy
Minutes No. 02 of 27.09.2017

Head of chair, PhD, professor


Ilia Catereniuc

SYLLABUS

DISCIPLINE HUMAN ANATOMY

Integrated studies

Type of course: **Compulsory**

Chisinau, 2017



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I. INTRODUCTION

- **General presentation of the discipline: place and role of the discipline in the formation of the specific competences of the professional / specialty training program**

Fundamental disciplines (*as human anatomy, histology, physiology etc.*) are interconnected with pharmaceutical studies in order to promote basic knowledge necessary to learn/ assimilate profile disciplines. Their aim is to prepare the students for major areas of activity as future pharmacist–initiation in the fundamental sciences is necessary for those who will practice in the community and hospital pharmacies.

Specialist in the field of drugs and medicines – pharmacist – has to possess knowledge about structure of human body in order to realize the action of drugs and medicines on organs and organ systems, evolution of the physiological phenomena in the organism etc.

Pharmacy curriculum ensures both foundation material from the fundamental sciences (*disciplines of anatomy, histology, physiology etc. which outline the necessary notions for profile disciplines*) and, pharmacist education and training.

Pharmacy profession is very important for the society, pharmacist together with other allied health care professionals deliver pharmaceutical products and services, promote drug use control in order to obtain maximum therapeutic benefit.

Human Anatomy is an important component of preclinical education and it is one of the oldest fundamental sciences of medical education, which can also be defined as science of the material substrate of the life and health.

Having as the object of research the living human body, Anatomy is an important component of preclinical education that supplies the student with information on the structure of the human body in phylogenesis and ontogenesis, the morphological variability of its structures, development anomalies, age, gender and individual specific features.

The human anatomy course studies the structure of the human body and its component parts at the macro- and mesoscopic levels, as well as their changes conditioned by interaction and interdependence with the other biological systems, which have influenced the formation of the *Homo sapiens* during evolution.

This information is useful for learning the other biomedical sciences, it provides not only basic knowledge about the morphology of human body but facilitates the creation of veritable notions regarding the organism as a whole, in which the structure is influenced by function and vice versa, in close connection with external environment.

- **Mission of the curriculum (aim) in professional training**

Human anatomy aims to study the structure of human body, the morphofunctional features of organs and organ systems in different periods of postnatal development, and to use that knowledge in learning of the basic, clinical and pharmaceutical disciplines, prevent various diseases, diagnose and treat them.

One of the main objectives of the course is to study the anatomy of the living person and to understand its educational role in professional training.

- **Languages of the course:** Romanian, Russian, English.
- **Beneficiaries:** First year students, Faculty of Pharmacy, specialty PHARMACIST.



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II. A MANAGEMENT OF THE DISCIPLINE

Code of the discipline		F.01.O.006	
Name of the discipline		Human Anatomy	
Person(s) in charge of the discipline		PhD, university professor, Ilia Catereniuc	
Year	I	Semester	I
Total number of hours		120	
Lectures		Practical/laboratory hours	51
Seminars		Self-training	52
Form of assessment	E	Number of credits	4



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III. TRAINING AIMS WITHIN THE DISCIPLINE

At the end of the course the student will be able:

✓ *at the level of knowledge and understanding to:*

- form clear and accurate ideas about the human anatomy, its evolution and branches, its role and place among the basic and clinical medical disciplines and about anatomy on a living person;
- know traditional and modern methods of anatomical examination;
- gain abilities necessary for professional activity as a pharmacist, directed for knowing and understanding the structure of human body, physiological and pathological mechanisms of functioning of organ systems and apparatuses;
- possess and reproduce information about the human body as a whole unit, its relationships with the environment, its constituent elements (tissues, organs, systems of organs, apparatuses);
- demonstrate knowledge about the essential stages of development of the body, ontogenesis and phylogenesis of organs and systems of organs;
- comprehend and reproduce general definitions about the norm, variants of norm, abnormalities and their applied significance;
- possess and reproduce information about the human body proportions, constitutional types, their applied significance; about the general structural features of the organs and systems of organs, the individual, age, and gender specific features of all anatomical formations;
- possess and reproduce information about individual, age and gender specific features of all anatomical formations at the macro- and mesoscopic levels; about their functions, topography, radiography, ultrasound, MRI, endoscopic methods, and projection on a living person;
- conceive and reproduce the information regarding the histological elements and their role in the application, processing and elimination of the drug substances from the body;
- know International Anatomical Terminology elaborated by FICAT (Federative International Committee on Anatomical Terminology, 1998).

✓ *at the application level to:*

- apply the theoretical knowledge in the professional activity;
- identify anatomical formations and arrange them into anatomical position;
- demonstrate the structural aspects of the body regions (on the dissected corpse), anatomical samples, molds, etc.;
- demonstrate on a living person the projection of the principal anatomical structures (viscera, blood vessels and nerves);
- know and determine the types of constitution of the human body;
- identify anatomical structures on radiological (radiograms, tomography) and sonographic and MRI images;
- palpate on a living person the landmarks of bones, joints and muscles;
- palpate the pulse on the arteries of the head, neck and limbs and indicate their points of compression in order to stop the bleeding;

✓ *at the integration level to:*

- evaluate and appreciate the importance of knowledge in the field of human anatomy in order to acquire basic medical, clinical and pharmaceutical disciplines;
- use information technologies to obtain, evaluate, store, produce, present and share information with colleagues in individual and group work;
- be capable to apply the studied material, that will contribute to the management of the professional activity;
- awareness of the applicability of anatomical knowledge for the professional activity as pharmacist;
- realize the significance of correct interpretation of the results in health status assessment and in the context of cooperation between the pharmacist – physician – laboratory specialist.



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IV. PROVISIONAL TERMS AND CONDITIONS

Basic knowledge in Human Anatomy.

Anatomy is a fundamental science in medical education, studying the human body and its ontogenetic development, which is closely related to the environmental changes and daily activities of each person.

For successful learning of the discipline it is required to have deep knowledge in the field of biology and anatomy gained during the pre-university studies, as acquaintance with the principles of formation of medical terms based on elementary knowledge of Latin language.

Discipline is oriented to the formation of initial knowledge necessary for future studying of physiology, physiopathology and morphology, pharmacology, clinical pharmacology and others with which anatomy is integrated vertically.

By using the methods, which come to support each physician (palpation, percussion, radiological, endoscopic, CT, ultrasonographic methods and others), anatomy becomes the science of all living forms and it is the basis for other disciplines of medical education, including the vocabulary of over 5000 terms, on which all the other sciences in medical education are based.

Modern medicine does not require from nowadays anatomy an abstract of human body structure and its shape, but real data about the structure of an individual.

Therefore, Anatomy is the science of living forms, of changing and reorganization of the human body. It includes systematization and integration of knowledge about the mutual connection and influence of somatic and visceral systems, about the influence of various external environmental factors on musculoskeletal and visceral activity and on the central nervous system.

For a good comprehension of the discipline, the first year student needs the following skills:

- good level of the language of instruction;
- confirmed competences in the sciences studied at lyceum (biology, chemistry, physics);
- digital competences (use of the Internet, document processing, electronic tables and presentations, use of graphics programs);
- ability to communicate and to work in a team;
- qualities - tolerance, compassion, creativity, initiative, autonomy.



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V. THEMES AND ESTIMATE ALLOCATION OF HOURS

No	THEME	Number of hours		
		Lec- tures	Practical hours	Self- training
1.	<i>General terms of anatomy and histology. The importance of knowledge in anatomy and histology for subsequent acquisition of the pharmaceutical and clinical disciplines.</i> Orientation elements of the human body. Parts, segments and regions of the body. Morphofunctional features of constitutional types.	2	3	3
2.	<i>Cell and tissues, general concepts. General histology.</i> <i>Functional anatomy of locomotor apparatus.</i> Locomotor apparatus - general concepts, components, functional role. Skeletal system and arthrosyndesmology: structure of the bones and joints, the bone as an organ, functions of the bones and joints. Classification of the bones and joints. Bones and joints of the trunk, limbs and head. The skull as a whole. Muscular system. Classification of the muscles, muscle as an organ. Muscles, fasciae and topography of the head, trunk and limbs.	2	9	9
3.	TEST. ASSESSMENT.		3	
4.	<i>General splanchnology. Functional anatomy of the internal organs, age structural features. Practical significance of knowledge on morpho-functional aspects of the internal organs in relation to pharmaceutical disciplines.</i> Digestive system - components, functional role. Oral cavity, pharynx, oesophagus, stomach, small and large intestine - structure, component parts, topography, features, functional role. Large digestive glands - liver and pancreas - structure, topography, functional relevance. Intra- and extrahepatic bile ducts, their structure. <i>The digestive system and its role in the application, processing and elimination of the drug substances from the body.</i> Respiratory system - components, structure, functional role. <i>The respiratory system as object of the impact of drug substances.</i> Urogenital apparatus - its components, structure, topography, functions. <i>The role of the urinary system in application, processing and elimination of the drug substances from the body.</i>	2	12	12
5.	<i>Cardiovascular system - heart and blood vessels - structure, topography, functions. The cardiovascular system as object of application of the drug substances.</i>	2	3	4
6.	TEST. ASSESSMENT.		3	
7.	<i>Functional anatomy of the endocrine system. Applied importance of the knowledge of the morphology of endocrine structures to acquire pharmaceutical disciplines.</i> Lymphoid system - its components, structure, functional role.	2	3	3
8.	<i>Central and peripheral nervous system – structure, components. Functional anatomy of the spinal cord and brain.</i> Cranial and spinal meninges, ventricular system and cerebrospinal fluid, its production and circulation. Spinal nerves - their formation.	2	6	6
9.	<i>Functional anatomy of the autonomic (vegetative) nervous system. The autonomic nervous system and drug substances.</i> Somatic and autonomic plexuses, their main branches. Sympathetic chain - components, topography, branches.	2	3	6
10.	<i>Cranial nerves, sensory and motor systems (analyzers) - general principles of their organization and classification. General sensibility, skin and its functions, applied significance on pharmaceutical aspect.</i> Cranial nerves - their real and apparent origins, types of fibers, areas of distribution. Sensory systems - classification. Structural features of the sense organs (visual, auditory, vestibular, olfactory, gustatory).	3	3	5
11.	ASSESSMENT.		3	
12.	Overview on the blood supply, nerve supply and lymphatic drainage of the locomotor apparatus and internal organs. General data about examination of the organs, organ systems and apparatuses on a living person.			4
Total		17	51	52



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VI. REFERENCE OBJECTIVES AND CONTENT UNITS

Objectives	Content units
Chapter 1. LOCOMOTOR APPARATUS	
<ul style="list-style-type: none"> • to define the basic concepts of anatomy. • to know: <ul style="list-style-type: none"> ✓ anatomy research methods; ✓ anatomical terminology; ✓ classification, structure and anatomic features of the bones, joints and muscles; ✓ the axes around which movements are performed and the movements produced in the joints in muscular contraction; ✓ muscular labor and muscular levers; ✓ fasciae and intermuscular spaces of the human body and their applied significance; ✓ bony, articular and muscular landmarks. • to demonstrate: <ul style="list-style-type: none"> ✓ abilities for analysis and systematization of knowledge; ✓ bony, articular and muscular landmarks on cadaveric material, radiographs and on a living person; • to apply the criteria for differentiation of the anatomical formations on the cadaver and parts of the body, radiograms and on a living person by: <ul style="list-style-type: none"> ✓ identification of the human body planes, axes and orientation lines; ✓ identification of individual and regional specific features of the bones of the trunk; ✓ identification of bony, articular, and muscular landmarks on cadaveric material and on a living person; • to integrate gained knowledge and apply it in practice. 	<ol style="list-style-type: none"> 1. <i>Anatomical terminology.</i> 2. <i>Anatomical landmarks of the human body.</i> 3. <i>General osteology.</i> Regional characteristics of the skeletal system: bones of the skull, bones of the trunk, bones of the limbs. 4. <i>General arthrology.</i> Joints of the trunk, limbs and skull. 5. <i>General myology.</i> Muscles of the topographical regions of the body: muscles of the trunk: muscles of the back, muscles of the thorax and muscles of the abdomen; muscles of the shoulder and pelvic girdles, muscles of the free limbs; muscles of the head and neck.
Chapter 2. INTERNAL ORGANS (DIGESTIV, RESPIRATORY, URINARY AND GENITAL SYSTEMS)	
<ul style="list-style-type: none"> • to define: <ul style="list-style-type: none"> ✓ notions of organ, organ system and apparatus; ✓ notions about tubular and parenchymatous organs; ✓ notion of digestive system; ✓ notion of respiratory system; ✓ notion of urinary system; ✓ notion of genital system. • to know: <ul style="list-style-type: none"> ✓ anatomical terminology and principles of classification, structure and topography of internal organs; ✓ individual and regional features of the organs of the digestive system; ✓ individual and regional features of the organs of the respiratory system, ✓ individual and regional features of the organs of the urinary system; ✓ individual and regional features of the genital (reproductive) organs. 	<ol style="list-style-type: none"> 1. General considerations regarding the structure, classification and topography of internal organs. 2. <i>Digestive system:</i> oral cavity, tongue, teeth and salivary glands; pharynx, oesophagus, stomach; small intestine and large intestine; liver and pancreas. <i>Regions of the abdomen, abdominal and peritoneal cavities. Peritoneum and extraperitoneal spaces.</i> 3. <i>Respiratory system:</i> upper and lower airways: nose, larynx, trachea, main bronchi. Thyroid and parathyroid glands, thymus. Respiratory organs: lungs and pleura. Mediastinum.



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Objectives

- **to demonstrate:**
 - ✓ anatomical formations on cadavers, molds, radiograms and on a living person;
 - ✓ abilities to identify the topographical landmarks necessary to determine the boundaries and projection of the internal organs.
- **to apply** the criteria for differentiating the anatomical formations on anatomical samples, cadavers, radiographs and on a living person.
- **to integrate** anatomical knowledge with clinical disciplines by:
 - ✓ drawing conclusions on the studied subject;
 - ✓ developing of own opinions about the individual, age and gender anatomical features of the studied organs.

Content units

4. *Urinary organs:* kidneys, ureters, urinary bladder. Adrenal glands and paraganglia.
5. *Male reproductive organs* and male urethra.
6. *Female reproductive organs* and female urethra.
7. *Perineum.*

Chapter 3. CARDIOVASCULAR AND LYMPHOID SYSTEMS

- **to define:**
 - ✓ cardiovascular system;
 - ✓ systemic and pulmonary circulations;
 - ✓ notions of arterial anastomoses;
 - ✓ notions of cavo-caval and portacaval anastomoses.
- **to know:**
 - ✓ anatomical terminology and principles of classification of the blood vessels;
 - ✓ peculiarities of blood supply of the internal organs, joints and skeletal muscles.
- **to demonstrate:**
 - ✓ anatomical formations on cadavers, molds and on a living person;
 - ✓ abilities to identify the topographical landmarks necessary to determine the projection of blood vessels.
- **to apply** the criteria for differentiating the anatomical formations on anatomical samples, cadavers, radiographs.
- **to integrate** anatomical knowledge with clinical disciplines by:
 - ✓ drawing conclusions on the studied subject;
 - ✓ developing of own opinions about studied subject.

1. *Heart and pericardium.*
2. *Regional lymph nodes.*
3. Blood vessels and lymphatics of the *head and neck.*
4. Vascularization and lymph drainage of the *abdominal cavity walls and organs.*
5. Blood vessels and lymph nodes of the *upper limb.*
6. Vascularization and lymphatic drainage of the *joints and muscles of the lower limb.*

Chapter 4. CENTRAL NERVOUS SYSTEM. SPINAL NERVES

- **to define:**
 - ✓ concepts related to the central nervous system (CNS);
 - ✓ derivatives of primary and secondary cerebral vesicles;
 - ✓ notions of variants and anomalies of CNS;
 - ✓ notions of spinal nerve and somatic plexus.
- **to know:**
 - ✓ anatomical terminology and principles of classification, structure and topography of CNS components;
 - ✓ individual and regional peculiarities of CNS;
 - ✓ anatomical terminology and classification of spinal nerves;
 - ✓ specific features of formation of the somatic plexuses.
- **to demonstrate:**
 - ✓ anatomic formations of central and peripheral nervous system on anatomical samples, molds, radiograms;

1. Spinal cord and spinal meninges.
2. Brainstem, components. Fourth ventricle.
3. Diencephalon. Third ventricle.
4. Cerebral hemispheres.
5. Localization of functions in the cerebral cortex. Limbic system.
6. White matter of the cerebral hemispheres. Basal nuclei. Lateral ventricles.
7. Cranial meninges and cerebrospinal fluid.
8. Conductive pathways of the



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Objectives	Content units
<ul style="list-style-type: none"> ✓ ability to identify the topographic landmarks needed to determine the boundaries and projection of the nerves. • to apply the criteria for distinguishing anatomical formations on the anatomical samples, on the body, on radiographs with transfer of knowledge to a living person: • to integrate anatomical knowledge with clinical disciplines by: ✓ concluding on the studied subject; ✓ developing own opinions on the individual, age and gender specific features of components of the central and peripheral nervous system. 	<p>central nervous system;</p> <p>9. Spinal nerves, their branches;</p> <p>10. Cervical plexus;</p> <p>11. Brachial plexus;</p> <p>12. Thoracic spinal nerves;</p> <p>13. Lumbar plexus;</p> <p>14. Sacral plexus.</p>
Chapter 5. CRANIAL NERVES AND SENSE ORGANS	
<ul style="list-style-type: none"> • to define: ✓ cranial nerves; ✓ notion of sensory system; ✓ notion of conducting pathway. • to know: ✓ anatomical terminology and principles of classification, structure and topography of the cranial nerves; • to demonstrate: ✓ anatomical formations on cadavers, molds, etc. • to apply criteria for differentiating anatomical formations on anatomical samples, cadavers. • to integrate anatomical knowledge with clinical disciplines by: ✓ concluding on the studied subject; • developing own opinions on the individual features of distribution of the cranial nerves. 	<ol style="list-style-type: none"> 1. Cranial nerves – their real and apparent origins, types of fibers, areas of innervations. 2. Sensory system. 3. Conductive pathways.
Chapter 6. VEGETATIVE NERVOUS SYSTEM.	
<ul style="list-style-type: none"> • to define: ✓ vegetative nervous system and its components; • to know: ✓ anatomical terminology and principles of classification, structure and topography of the components of the vegetative nervous system. • to demonstrate: ✓ anatomical formations on cadavers, molds, radiographs with the transfer of knowledge on a living person; ✓ components of the vegetative nervous system. • to apply criteria for differentiating anatomical formations on anatomical samples, cadavers. • to integrate anatomical knowledge with clinical disciplines by: ✓ concluding on the studied subject; ✓ developing own opinions on the individual, age and gender anatomic specific features of the vegetative nervous system. 	<ol style="list-style-type: none"> 1. Vegetative nervous system – components. 2. Sympathetic trunk. 3. Vegetative plexuses, components, main branches. 4. <i>Innervation of organ of vision.</i> ✓ Vegetative nervous system and eye (sympathetic and parasympathetic nerves, areas of innervation). ✓ Pupillary and corneal reflexes.



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VII. PROFESSIONAL (SPECIFIC (SC) AND TRANSVERSAL (TC)) COMPETENCES AND STUDY OUTCOMES

✓ PROFESSIONAL COMPETENCES (specific) (SC)

- CP1. Knowledge, understanding and use of anatomical language;
- CP2. Knowledge of the features of the structure, development and functioning of the human body;
- CP3. Knowledge of the organization of the locomotor apparatus, of the systems of organs, vascular and nervous systems;
- CP4. Identification of normal anatomical formations, anatomical variants and anomalies on cadavers and on a living person;
- CP5. Knowledge and identification of anatomical landmarks on preparations, molds and on a living person;
- CP6. Knowledge of projection of anatomical formations on a living person and the ability to describe and determine the limits of the internal organs related to bones, muscles and other landmarks;
- CP7. Description of radiographs, tomograms, MRI, sonographic results, etc.;
- CP8. Knowledge of anatomical dissection techniques;
- CP9. Practical application of anatomical knowledge;
- CP10. Solving of case based problems and formulating the conclusions;
- CP11. Performing of various practical exercises and procedures for carrying out specific professional activities based on anatomical knowledge and other fundamental disciplines.

✓ TRANSVERSAL COMPETENCES(TC)

- CT1. Developing autonomic decisional capacity;
- CT2. Formation of personal attitude;
- CT3. Ability of social interaction and group activity;
- CT4. Fitting in interdisciplinary projects, extracurricular activities;
- CT5. Performing activities and exercising the specific role for studying the discipline in a team. Promoting the spirit of initiative, dialogue, cooperation, positive attitude and respect for colleagues, empathy, altruism and continuous improvement of one`s activities;
- CT6. Developing different learning techniques;
- CT7. Selection of digital materials, critical analysis and conclusions;
- CT8. Presentation of individual scientific projects;
- CT9. Responsible execution of professional tasks with the application of the values and norms of professional ethics, as well as the provisions of the legislation in force. Promoting logical reason, practical application, assessment and self-assessment in decision-making;
- CT10. Objective self-evaluation of continuing vocational training skills to develop personal and professional skills.

✓ STUDY OUTCOMES

At the end of studying of the content unit the student will be capable:

- to have knowledge about structure, topography and anatomical features of the organs and organ systems;
- to understand the principles of application and transfer of knowledge in medical practice;
- to apply on a living person the theoretical knowledge regarding determination of limits and projection of the organs to anatomical landmarks;
- to be able to describe the radiographies, MRI, endoscopic, sonographic images, etc;
- to be able to deduce possible causes and understand the mechanisms that influence the physiological processes, which can contribute to the appearance of anatomical variants and development anomalies;
- to evaluate the place and role of human anatomy in the preclinical training of a medical student;
- to be able to implement the gained knowledge in the research activity;
- to possess skills of analysis and synthesis of information, and to be able to use the acquired knowledge and Information Technologies.



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VIII. STUDENT'S SELF-TRAINING

Suggestions for individual activity

The passive listening of the course is one of the less efficient methods of learning, even when it is well structured and illustrated. That is why in order to memorize the material many teaching methods related to the delivered material are required.

The practical work is more efficient than reading of how to do it.

Students who desire to succeed in the course of Human Anatomy need to work insistently and actively with the demonstrative material.

Considering the learning methodology the department would suggest the students some tips to be followed:

1. First of all, it is necessary to make acquaintance with the subjects which should be answered using the notes from your workbook.

2. Read attentively the text from the textbook, make notes. Try to formulate yourselves the main ideas. Study the schemes and images from the textbook and workbook. Use the acquired knowledge to demonstrate on anatomical samples. Answer the questions from your workbooks for practical work.

3. Come to lectures not only for the sake of being present! If you do so, you will not be able to meet all the requirements. At lectures take notes attentively asking yourselves if you understand the explained material, rating your level of knowledge.

4. Mind the following: teachers are more than happy when you ask questions. This means that you try to understand and process the studied material.

5. For a more progressive comprehension of the lecture you are advised to organize yourselves into 2-3 students for regular meetings in order to discuss the theme which was studied at the lesson preparing yourselves for the tests and exams. As a rule, the material is memorized easier in groups, than when you work on your own.

6. The course of Human Anatomy expects a lot from you. It comprises around 5000 terms, the majority of them are new and need to be memorized. These requirements involve a rational time usage, so, it will be necessary to handle time so as to find the balance between the effort given for an appropriate knowledge feedback and your private life.

Depth of the subject knowledge requires each working hour of direct contact with the teacher to be supplemented with at least 1-2 hours of individual student's work.

For a successful comprehension of the course in Human Anatomy, you need to work individually around 8-10 hours per week.

For that purpose, you should use the *Anatomical Study Hall* of the Department of Human Anatomy.



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No.	Expected product	Implementation strategies	Assessment criteria	Implementation terms
1.	Work with textbook and information resources	Systematic work in the library and with audiovisual production. Examination of the electronic sources related to the discussing subject.	1. Logical thinking, flexibility. 2. Quality of systematization of the gained knowledge through the self-training.	During the semester
2.	Report	Analysis of relevant sources related to the theme of the report. Analysis, systematization and synthesis of information on the theme. Making the report in conformity with effectual requirements and present it at the department.	1. Quality of systematization and analysis of the gained knowledge through the self-training. 2. Concordance of information with proposed theme.	During the semester
3.	Work with anatomical samples and cadaveric material in the <i>Anatomical Study Hall</i> (over program).	The student will benefit from the self-training program in the <i>Anatomical Study Hall</i> after hours. If required, he can contact the professor on duty. Interaction conditions are created with both group colleagues and other students from all faculties. The student is able to work with anatomical preparations himself or in a team.	1. Workload. 2. Ability to demonstrate anatomical formations on samples. 3. Formulating conclusions on applied significance of the anatomical formations.	During the semester



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IX. METHODOLOGICAL SUGGESTIONS FOR TEACHING-LEARNING-ASSESSMENT

- **Teaching and learning methods used**

1. The Human Anatomy discipline is delivered according to the classical methodology; with lectures and practical classes.
2. The theoretical course is delivered in the lectures held by the course holders. An interactive lecture is practiced.
3. Also, the following methods are used:
 - ✓ explanation;
 - ✓ brainstorming;
 - ✓ heuristic conversation and debate;
 - ✓ group work;
 - ✓ individual work;
 - ✓ working with manual, scientific text and the anatomy atlas;
 - ✓ solving the case based problems;
 - ✓ interactive listening.

- **Applied teaching strategies / technologies (specific to the discipline)**

In practical work, together with the teacher of the group, students study on the anatomical samples, use planes, molds, tables, fill in the workbooks, do preparation of anatomical samples that would be further demonstrated to the colleagues.

- **Methods of assessment (including the method of final mark calculation)**

Current: frontal/individual assessment of knowledge by:

- ✓ written assessments;
- ✓ demonstration of anatomical structures included in the curriculum of the discipline on the anatomical samples;
- ✓ solving the docimological tests in University Informational Management System (UIMS) – SIMU;
- ✓ graphical representation of the schemes on certain subjects;
- ✓ completion of practical workbooks for individual work;
- ✓ solving the case based problems.

Three assessments, including assessment of the practical skills are organized at Human anatomy discipline, during the semester of study, as follows:

Assessment no. 1 – Locomotor apparatus (oral evaluation / practical skills + testing + self-training).

Assessment no. 2 – Internal organs (viscera). Cardiovascular system (oral evaluation / practical skills + testing + self-training).

Assessment no. 3 – Lymphoid and immune systems. Central and peripheral (cranial and spinal nerves) nervous system. Vegetative nervous system (oral evaluation / practical skills + testing + self-training).

Assessment of practical skills.

Final: assessment - exam.

Examination of Human anatomy discipline consists of testing in the UIMS – SIMU.

The overall score is based on two components: **the half-yearly average score** with the coefficient 0.5 and the **SIMU test** with the coefficient of 0.5.

Assessment of knowledge is graded from 10 to 1.0 (with decimals).



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Scale of assessment using rounded marks values

Intermediate marks scale (annual average, marks from the examination stages)	National Assessment System	ECTS Equivalent
1,00-3,00	2	F
3,01-4,99	4	FX
5,00	5	E
5,01-5,50	5,5	
5,51-6,0	6	
6,01-6,50	6,5	
6,51-7,00	7	D
7,01-7,50	7,5	
7,51-8,00	8	C
8,01-8,50	8,5	
8,51-8,00	9	
9,01-9,50	9,5	A
9,51-10,0	10	

The average annual mark and the marks of all stages of final examination (computer test, oral) - are expressed in numbers according to the mark scale (according to the table), and the final mark obtained is expressed in number with two decimals, which is transferred to student's record-book.

Absence on examination without a reason is recorded as "absent" and is equivalent to 0 (zero). The student has the right to have two re-examinations.



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IX. RECOMMENDED LITERATURE:

A. Compulsory:

1. GLOBA L. Human Anatomy. Angiology, Peripheral Nervous System and Sense Organs. Chişinău, 2012.
2. HACINA T. Guide in anatomy: Locomotor apparatus, Chişinău, 2013.
3. PRIVES M., LYSENKOV N., BUSHKOVICH V. Human Anatomy, vol. I. /The weight-bearing or locomotor apparatus. The science of the viscera. / Translated from the Russian by Ludmila Aksenova. 1985. Mir Publishers, Moscow, 1989.
4. PRIVES M., LYSENKOV N., BUSHKOVICH V. Human Anatomy, vol. II. /The science of the vessels. The science of the nervous system. The science of the sense organs. / Translated from the Russian by Ludmila Aksenova. 1985. Mir Publishers, Moscow, 1989.
5. SINELNICOV R. D., SINELNICOV IA. R. Atlas of human anatomy, vol. I, II, III, IV, M. 1990.

B. Additional:

1. CATERENIUC I., LUPASCU T., BABUCI A. et al. Culegere de scheme la anatomia omului / Сборник схем по анатомии человека / Collection of schemes for human anatomy. Chişinău, 2012, 2014.
2. KEITH L. MOORE, ARTUR F. DALLEY, ANNE M.R. AGUR. Clinically Oriented Anatomy, 6-th ed., 2007.
3. DRAKE R. L., VOGL W., MITCHELL A. W. M. et al. Gray's Atlas of Anatomy. Elsevier, 2008.
4. DRAKE R. L., VOGL W., MITCHELL A. W. M. Gray's Anatomy for students. Philadelphia... Toronto, 2005.
5. NETTER FRANK H. Atlas of Human Anatomy. 4-th Edition, Elsevier, 2006.