INSTITUTE OF ENGINEERING PHYSICS FOR BIOMEDICINE

APPROVED НТС ИФИБ

Protocol No. 3.1

dated 30.08.2024

## ACADEMIC COURSE OUTLINE

АНЕСТЕЗИОЛОГИЯ И РЕАНИМАТОЛОГИЯ / ANAESTHESIOLOGY, REANIMATOLOGY

Educational program track (speciality)      [1] 31.05.01 General Medicine

| Semester | Labour input, credits | Total course academic, hours | Lectures, hrs. | Practical sessions, hrs. | Laboratory sessions, hrs. | In the form of practical studies, hrs. | Independent studies, hrs. | Independent studies monitoring, hrs. | Course progress, Exam/Pass-fail exam/Term |
|---|---|---|---|---|---|---|---|---|---|
| 12 | 3 | 108 | 16 | 0 | 40 | | 52 | 0 | PFE |
| Total | 3 | 108 | 16 | 0 | 40 | 40 | 52 | 0 | |

**ABSTRACT**

Providing students with comprehensive theoretical and applied knowledge of the nature of disorders of vital functions, methods of first aid in emergency conditions, the tools and principles of intensive care, as well as developing the ability to apply this knowledge in practice.

## 1. ACADEMIC COURSE GOALS AND OBJECTIVES

The goal of the discipline is to develop competencies necessary for providing medical care to patients in emergency and urgent situations.

Objectives

- To develop a system of knowledge on the etiology and pathogenesis of critical conditions, the nature of disorders of vital bodily functions, and the pathophysiological processes occurring during dying and recovery.

- To develop an understanding of the organizational principles and capabilities of modern anesthesiology and resuscitation.

- To develop a system of knowledge on the diagnostics and treatment principles of critical conditions in surgical, therapeutic, and other patient categories, including modern methods of monitoring and detoxification used in intensive care.

- To develop skills for a qualified clinical approach to patients with impaired vital functions.

- To develop skills for providing emergency care to patients in critical conditions, including performing resuscitation procedures in cases of acute respiratory or circulatory failure and clinical death.

- To develop skills in simple analgesia techniques during painful procedures and interventions, as well as in the management of pain syndromes.

- To develop a consistent algorithm for cardiopulmonary and cerebral resuscitation.

## 2. PLACE OF THE ACADEMIC COURSE IN THE MAIN HIGHER EDUCATION CURRICULUM

The discipline is implemented as part of the core curriculum. It is based on the knowledge and skills obtained in the study of normal and pathological anatomy, normal and pathological physiology, topographic anatomy and operative surgery, medical microbiology and virology, immunology, pharmacology, propedeutics of internal medicine, radiology, general surgery, internal medicine and surgery (faculty level), obstetrics, dermatology and venerology, neurology, hygiene, gynecology, pediatrics, psychiatry, infectious diseases, endocrinology, clinical pharmacology, outpatient therapy, as well as diagnostic, obstetric-gynecologic, surgical, therapeutic, and outpatient clinical practice.

The knowledge and skills obtained in mastering this discipline are essential for successful completion of clinical practice in emergency medical procedures and for effective professional activity.

## 3. DEVELOPED COMPETENCIES AND INTENDED LEARNING OUTCOMES

Universal and/or general professional competencies:

| Competency code and title | Code and title of competency-based rubrics |
|---|---|
| ОПК-4 [1] – Capable of using medical devices stipulated by the medical care procedures, as well as conducting patient examination for diagnosis establishment. | З-ОПК-4 [1] – Know: - modern diagnostic instrumental examination methods for patients, including functional, radiological, ultrasound, radionuclide diagnostics, and endoscopy; - diagnostic capabilities of instrumental examination methods; - medical devices stipulated by the procedure for providing medical care to the adult population in the "Therapy" specialty, and the equipment standard for a therapeutic room; - main medical devices stipulated by the procedures for providing medical care to the adult population in major surgical specialties, obstetrics, and gynecology; - indications for referring patients for instrumental examinations and functional diagnostics; - techniques for physical examination of patients using medical devices stipulated by procedures and considering medical care standards <br><br> У-ОПК-4 [1] – Be able to: - use medical devices stipulated by the medical care procedure; - determine the required volume and content of instrumental and functional diagnostics to establish a diagnosis; - interpret results of the most common functional and instrumental diagnostic methods <br><br> В-ОПК-4 [1] – Possess skills in: - using basic medical devices (stethoscope, blood pressure monitor, sphygmomanometer, pulse oximeter, height-weight scale, measuring tape, neurological hammer, scalpel, forceps, and other devices); - operating electrocardiographs and devices for measuring external respiratory function; - interpreting results of the most common functional and instrumental diagnostic methods |
| ОПК-6 [1] – Capable of organizing general nursing, providing primary medical care, ensuring the organization of work and making professional decisions in emergencies at the pre-hospital stage, in emergency situations, epidemics and in areas of mass destruction | З-ОПК-6 [1] – Know: - a set of measures for general nursing with diseases of various organs and systems; Signs of clinical and biological death; - indications for patient hospitalization for the most common diseases with typical progression. <br><br> У-ОПК-6 [1] – Be able to: - organize care for patient when providing medical care in an outpatient setting; - determine the need for patient hospitalization; - ensure the organization of work in emergency situations, epidemics, and in mass casualty zones. <br><br> В-ОПК-6 [1] – Possess skills in: - general care of a patient (general nursing); - providing first aid; - making medical decisions in emergencies at the prehospital stage, including in emergency situations, epidemics, and in mass casualty zones. |
| ОПК-7 [1] – Capable of prescribing treatment and monitoring its effectiveness and safety. | З-ОПК-7 [1] – Know: - pharmacological groups of medicinal drugs and their intended purposes; - mechanisms of action of pharmacological and non-pharmacological treatments, indications and contraindications for their use, side effects, and complications caused by their application; - methods for monitoring the effectiveness and safety of various treatment approaches. <br><br> У-ОПК-7 [1] – Be able to: - make rational choices for pharmacological and non-pharmacological treatments based on clinical guidelines and in accordance with medical care standards; - develop a treatment plan for a disease or condition |

considering the diagnosis, age, disease course characteristics, and comorbidities, based on clinical guidelines and medical care standards; - prescribe medications, medical devices, and therapeutic nutrition considering the diagnosis, age, disease course characteristics, and comorbidities, based on clinical guidelines and medical care standards; - justify prescribed pharmacological and non-pharmacological treatments; - evaluate the effectiveness and safety of medications, medical devices, therapeutic nutrition, and other treatment methods.

В-ОПК-7 [1] – Possess skills in: - administering medications through various routes of administration; - developing treatment plans for diseases or conditions considering diagnosis, age, disease course characteristics, and comorbidities; - assessing the effectiveness and safety of prescribed treatments.

Professional competencies in compliance with the goals and professional knowledge areas:

| Professional activity goal | Professional activity knowledge area | Professional competency code and title; Based on the professional standard, experience analysis | Code and title of competency-based rubrics |
|---|---|---|---|
| medical | | | |
| Providing medical care to patients in urgent and emergency forms. | Individuals (patients); the population; the set of means and technologies aimed at creating conditions for preserving and strengthening the health of the adult population | ПК-3.1 [1] - Able to provide medical care to patients in urgent or emergency forms

*The base:*
Professional standard: 02.009 | З-ПК-3.1[1] - Know: - clinical signs of sudden cessation of breathing, circulation, loss of consciousness, life-threatening mental disorders for the patient or others; - indications for external defibrillation; - principles of external electro-impulse therapy (defibrillation) devices and rules for performing external defibrillation; - rules for performing basic cardiopulmonary resuscitation.; У-ПК-3.1[1] - Be able to: - recognize conditions (sudden acute illnesses, exacerbations of chronic diseases) requiring medical care in urgent or emergency forms; - identify clinical signs of sudden cessation of breathing, circulation, loss |

| | | | |
|---|---|---|---|
| | | | of consciousness, life-threatening mental disorders for the patient or others; - organize and perform basic cardiopulmonary resuscitation and external defibrillation measures.; В-ПК-3.1[1] - Possess skills in: - assessing the patient's condition requiring medical care in urgent and emergency forms; - performing basic cardiopulmonary resuscitation; - using medications and medical devices for providing medical care in emergency or urgent forms. |
| Diagnostics of diseases and pathological conditions of the patients. | Individuals (patients); the population; the set of means and technologies aimed at creating conditions for preserving and strengthening the health of the adult population | ПК-3.2 [1] - Capable of conducting patient examinations to establish a diagnosis *The base:* Professional standard: 02.009 | З-ПК-3.2[1] - Know: - clinical diagnosis establishment algorithm; - patient history-taking and physical examination methodology; - laboratory and instrumental research methods for health assessment to establish a diagnosis; - semiotics of diseases of different organs and systems; - structure, principles of the current International Statistical Classification of Diseases and Related Health Problems (hereinafter - ICD).; У-ПК-3.2[1] - Be able to: - conduct patient history-taking and physical examination; - interpret history, physical examination data, laboratory and instrumental results to recognize a condition or establish the presence/absence of a disease, establish a diagnosis; - distinguish and recognize in each specific case tissue damage, the |

| | | | reaction to it, and the form of adaptability; - develop a patient examination plan, justify the necessity and scope of laboratory and instrumental examination; - identify main pathological conditions, symptoms and syndromes, nosological forms in the patient according to the current ICD.;<br>В-ПК-3.2[1] - Possess skills in: - patient history-taking and physical examination; Formulating a preliminary diagnosis; - developing a patient examination plan; Interpreting laboratory and instrumental results; - establishing a diagnosis considering the current ICD |
|---|---|---|---|
| Providing primary medical care in outpatient settings and day hospital settings. | Individuals (patients); the population; the set of means and technologies aimed at creating conditions for preserving and strengthening the health of the adult population | ПК-3.3 [1] - Able to provide primary medical care in an outpatient setting<br><br>*The base:*<br>Professional standard: 02.009 | З-ПК-3.3[1] - Know: - general issues of organizing medical care for the population and organizing medical care for the adult population in outpatient settings, including at home; - features of medical care using telemedicine technologies; - Clinical picture, differential diagnosis, features of the course of the disease, complications and outcomes of internal diseases; - diagnostic criteria for the most common diseases of internal organs and systems; - indications for referring patients for specialist consultations according to clinical guidelines and considering relevant medical care standards; - indications for referring patients for |

| | | | specialized medical care in inpatient settings and day hospitals according to clinical guidelines and considering relevant medical care standards; - features of managing and treating elderly patients in outpatient settings. ; У-ПК-3.3[1] - Be able to: - perform differential diagnosis of internal diseases; - monitor the course of physiological pregnancy; - justify the need for referring patients to specialist consultations; - recognize the main and concomitant diseases; - assess disease or condition severity - the degree of organ and/or system damage or functional impairment due to the disease/condition or its complications; - determine management, examination and treatment tactics for patients with specific diseases (nosological units) depending on disease severity and condition, according to clinical guidelines and considering relevant medical care standards.; В-ПК-3.3[1] - Possess skills in: - conducting differential diagnosis with other diseases/conditions, including emergencies; - interpreting data obtained from patient consultations with specialists; - prescribing additional tests to clarify the diagnosis; - formulating a clinical diagnosis; - prescribing treatment according to clinical guidelines and considering relevant medical care standards. |
|---|---|---|---|

## 4. PEDAGOGIC POTENTIAL OF THE COURSE

| Pedagogic tracks/objectives | Pedagogic goals (code) |
|---|---|
| Vocational and labor education | Establishing conditions for: formation of a deep understanding of the profession's social role, a positive and active commitment to the values of the chosen specialty, and a responsible attitude towards professional activity and work (В14) |
| Vocational and labor education | Establishing conditions for: formation of psychological readiness for professional activity in the chosen profession (В15) |
| Professional education | Establishing conditions for: formation of responsibility for professional choice, professional development and professional decisions (В18) |
| Professional education | Establishing conditions for: formation of motivation to improve the quality of medical care to the population and the desire to follow the rules and norms of interaction between the doctor, colleagues and the patient, contributing to the creation of the most favorable environment for the patient's recovery (В34) |

## 5. ACADEMIC COURSE STRUCTURE AND CONTENT

Academic course sections, their scope, terms of study and assessment:

| No. | Academic course section name | Weeks | Lectures/ Practical (seminars)/ Laboratory sessions, hrs. | Compulsory current assessment (form*, week) | Maximum grade per section** | Section assessment (form*, week) | Competency-based rubrics |
|---|---|---|---|---|---|---|---|
| | *12 Semester* | | | | | | |
| 1 | The First Section | 1-8 | 8/0/20 | | 25 | S-8 | З-ОПК-4, У-ОПК-4, В-ОПК-4, З-ОПК-6, У-ОПК-6, В-ОПК-6, З-ОПК-7, У-ОПК-7, В-ОПК-7, З-ПК-3.1, У-ПК-3.1, В-ПК-3.1, З-ПК-3.2, У-ПК-3.2, В-ПК-3.2, З-ПК-3.3, |

| | | | | | | | У-ПК-3.3, В-ПК-3.3 |
|---|---|---|---|---|---|---|---|
| 2 | The Second Section | 9-15 | 8/0/20 | | 25 | S-15 | З-ОПК-4, У-ОПК-4, В-ОПК-4, З-ОПК-6, У-ОПК-6, В-ОПК-6, З-ОПК-7, У-ОПК-7, В-ОПК-7, З-ПК-3.1, У-ПК-3.1, В-ПК-3.1, З-ПК-3.2, У-ПК-3.2, В-ПК-3.2, З-ПК-3.3, У-ПК-3.3, В-ПК-3.3 |
| | *Totals for 12 Semester* | | 16/0/40 | | 50 | | |
| | **Assessment events for 12 Semester** | | | | 50 | PFE | З-ОПК-4, У-ОПК-4, В-ОПК-4, З-ОПК-6, У-ОПК-6, В-ОПК-6, З-ОПК-7, У-ОПК-7, В-ОПК-7, З-ПК-3.1, У-ПК-3.1, В-ПК-3.1, З-ПК-3.2, У-ПК-3.2, В-ПК-3.2, З-ПК-3.3, У-ПК-3.3, В-ПК-3.3 |

\* – abbreviated name of assessment

\*\* – 100 maximum points per semester including a pass/fail exam and (or) an exam

Abbreviated current assessment forms and section assessment

| Abbreviation | Full name |
|---|---|
| S | Summary |
| PFE | Pass/fail examination |

**SYLLABUS**

| Weeks | Topics / Content | Lect., hrs. | Pr./sem., hrs. | Lab., hrs. |
|---|---|---|---|---|
| | *12 Semester* | 16 | 0 | 40 |
| **1-8** | **The First Section** | 8 | 0 | 20 |
| 1 - 4 | **Anesthesiology** Classification of modern anesthetic techniques. Methods of anesthesia. Local anesthesia: topical, infiltration, regional. General anesthesia: inhalational and intravenous. Anesthesia-related risk. Intraoperative monitoring. Preoperative assessment and preparation for surgery and anesthesia. | All | | |
| | | 4 | 0 | 10 |
| | | Online | | |
| | | 0 | 0 | 0 |
| 5 - 8 | **Resuscitation Medicine** Resuscitation Medicine Basic and advanced life-support measures. Pharmacologic therapy. Defibrillation | All | | |
| | | 4 | 0 | 10 |
| | | Online | | |
| | | 0 | 0 | 0 |
| **9-15** | **The Second Section** | 8 | 0 | 20 |
| 9 - 15 | **Intensive Care** Acute disturbances of acid–base balance. Acute water–electrolyte imbalances. Fundamentals of infusion–transfusion therapy (ITT). Acute respiratory failure. Shock. Comatose states. Exogenous and endogenous intoxications. | All | | |
| | | 8 | 0 | 20 |
| | | Online | | |
| | | 0 | 0 | 0 |

Abbreviated names of online options:

| Abbreviation | Full name |
|---|---|
| EC | E-course |
| FtM | Full-text material |
| FtL | Full-text lectures |
| VM | Video materials |
| AM | Audio materials |
| Prs | Presentations |
| T | Tests |
| ERM | E-reference materials |
| IS | Interactive site |

LABORATORY (LAB) SESSIONS TOPICS

| Weeks | Topics / Content |
|---|---|
| | *12 Semester* |
| 1 - 4 | **Anesthesiology** Classification of modern anesthetic techniques. Methods of anesthesia. Local anesthesia: topical, infiltration, regional. General anesthesia: inhalational and intravenous. Anesthesia-related risks. Intraoperative monitoring. Preoperative evaluation and preparation for surgery and anesthesia. |
| 5 - 8 | **Resuscitation Medicine** Basic and advanced resuscitation measures. Pharmacologic management. Defibrillation. First aid in emergency conditions (drowning, electrical injury, thermal injuries — heat stroke and sunstroke, hypothermia). |
| 9 - 15 | **Intensive Care** |

| | Etiology and pathogenesis of acute acid–base imbalances. Types of disturbances. Intensive care management of identified abnormalities. |
| | Etiology and pathogenesis of acute water–electrolyte disorders. Types of disturbances. Intensive care management of identified abnormalities. |
| | Indications for infusion–transfusion therapy (ITT). Basic and corrective ITT. Infusion solutions: crystalloids and colloids. Central venous catheterization. Assessment of volume status. |
| | Etiology, pathogenesis, and types of acute respiratory failure; clinical presentation and diagnosis. Adult respiratory distress syndrome, status asthmaticus. |
| | Interpretation of pulmonary function changes and arterial blood gas analysis. Intensive care management of acute respiratory failure. |
| | Clinical forms of shock: hypovolemic, cardiogenic, anaphylactic, septic, and others. Acute adrenal insufficiency. Multiple organ dysfunction syndrome in shock. Treatment methods. Fundamentals of infusion therapy. |
| | Definition, etiology, and pathogenesis of coma. Clinical presentation. General principles of intensive care of comatose patients. |
| | Exogenous and endogenous intoxications. Principles of intensive care. |
| | First aid in acute poisonings. |

## 6. EDUCATIONAL TECHNOLOGIES

The use of information technologies in the educational process for this discipline is carried out in accordance with the approved Regulations on the Electronic Information and Educational Environment of the National Research Nuclear University.

The Learning Management System (LMS) is used to implement educational programs in full-time, distance, and blended learning formats.

The system provides the following core functions:
• Creation and management of classes
• Course creation
• Enrollment of students in courses
• Providing students with access to learning materials
• Publishing assignments
• Assessing student work, administering tests, and tracking academic progress
• Facilitating communication among participants in the educational process

The LMS is integrated with additional services that enable the use of a work calendar, video conferencing, multi-user document editing, creation of survey forms, and an interactive whiteboard.

List of information technologies used:
– Review of homework assignments and student consultations via the electronic educational environment
– Use of electronic presentations during practical sessions
– A set of educational training videos

## 7. ASSESSMENT TOOLKIT

The assessment toolkit ensures verification of the intended learning outcomes achievement (competency-based rubrics) using current, midterm and interim assessment of the course.

The link between developed competencies and their assessment is presented in the following table:

| Competency | Achievement rubrics | Assessment activity (Syl 1) |
|---|---|---|
| ОПК-4 | З-ОПК-4 | PFE, S-8, S-15 |
| | У-ОПК-4 | PFE, S-8, S-15 |
| | В-ОПК-4 | PFE, S-8, S-15 |
| ОПК-6 | З-ОПК-6 | PFE, S-8, S-15 |
| | У-ОПК-6 | PFE, S-8, S-15 |
| | В-ОПК-6 | PFE, S-8, S-15 |
| ОПК-7 | З-ОПК-7 | PFE, S-8, S-15 |
| | У-ОПК-7 | PFE, S-8, S-15 |
| | В-ОПК-7 | PFE, S-8, S-15 |
| ПК-3.1 | З-ПК-3.1 | PFE, S-8, S-15 |
| | У-ПК-3.1 | PFE, S-8, S-15 |
| | В-ПК-3.1 | PFE, S-8, S-15 |
| ПК-3.2 | З-ПК-3.2 | PFE, S-8, S-15 |
| | У-ПК-3.2 | PFE, S-8, S-15 |
| | В-ПК-3.2 | PFE, S-8, S-15 |
| ПК-3.3 | З-ПК-3.3 | PFE, S-8, S-15 |
| | У-ПК-3.3 | PFE, S-8, S-15 |
| | В-ПК-3.3 | PFE, S-8, S-15 |

**Educational achievement rubrics scales**

The scale of each assessment activity varies from 0 to the maximum established point, inclusive. The final assessment of the course is performed on a 100-point scale and represents the sum of the points earned by the student in the section assessments, framework of current and interim assessment.

Sections and interim assessments are considered passed when the student achieves a minimum score equal to 60% of the maximum. The final grade is assigned only upon passing all sections and the interim assessment.

The final grade is assigned in accordance with the following scale:

| Total score | Rating on a 4-point scale | Pass/fail examination | ECTS assessment |
|---|---|---|---|
| 90-100 | 5 – «excellent» | | A |
| 85-89 | | | B |
| 75-84 | 4 – «good» | «pass» | C |
| 70-74 | | | D |
| 65-69 | 3 – «satisfactory» | | |
| 60-64 | | | E |
| below 60 | 2 – «fail» | «fail» | F |

An "excellent" grade indicates a deep and solid mastery of the program material by a student who presents their answers consistently, clearly, and logically, is able to closely link theory with practice, and uses materials from monographic literature in their answers.

A "good" grade corresponds to a student's solid knowledge of the material, who presents their answers competently and to the point, without any significant inaccuracies.

A "satisfactory" grade corresponds to the basic level of mastery of the material by the student, in which the main material has been mastered, but its details have not been assimilated, the answers contain inaccuracies, insufficiently correct wording and logical inconsistencies.

A grade "pass" corresponds to at least a basic level of mastery of the program material, in which the student possesses the necessary knowledge, skills, and abilities, and is able to apply theoretical principles to solve typical practical problems.

A grade "fail" is given to a student who lacks a significant understanding of the curriculum material, makes significant errors in their answers, or fails all required assignments. These students are generally unable to continue their studies without additional classes.

## 8. ACADEMIC COURSE EDUCATIONAL, METHODOLOGICAL AND INFORMATIONAL SUPPORT

CORE READING:

1. ЭИ Д 64 Анестезиология и реаниматология : учебник, Долина О.А., Москва: ГЭОТАР-Медиа, 2021

2. ЭИ И 73 Интенсивная терапия. В 2 томах. Том 1 : национальное руководство,  , Москва: ГЭОТАР-Медиа, 2022

3. ЭИ И 73 Интенсивная терапия. В 2 томах. Том 2 : национальное руководство,  , Москва: ГЭОТАР-Медиа, 2022


FURTHER READING:

1. ЭИ П 27 Анестезиология и реаниматология (боль и обезболивание) : учебное пособие для вузов, Перепелица С. А. [и др.], Москва: Юрайт, 2024

2. ЭИ К 70 Анестезиология, реанимация, интенсивная терапия. Клинико-лабораторная диагностика : учебник для вузов, Эмануэль В. Л., Страшнов В. И., Корячкин В. А., Москва: Юрайт, 2024

3. ЭИ О-31 Безопиоидная аналгезия в хирургии : от теории к практике : практическое пособие, Яворовский А.Г., Овечкин А.М., Москва: ГЭОТАР-Медиа, 2024

4. ЭИ Б 78 Внезапная сердечная смерть : Серия "Библиотека врача-специалиста", Бокерия Л.А. [и др.], Москва: ГЭОТАР-Медиа, 2020

5. ЭИ А 72 Водно-электролитный обмен и его нарушения : руководство для врачей : , Антонов В.Г., Карпищенко А.И., Москва: ГЭОТАР-Медиа, 2022

6. ЭИ И 73 Интенсивная терапия : монография,  , Москва: ГЭОТАР-Медиа, 2019

7. ЭИ С89 Основы реаниматологии : учебник, С.А. Сумин, Т.В. Окунская, Москва: ГЭОТАР-Медиа, 2016

SOFTWARE:

No special softwares is required

LMS AND ONLINE RESOURCES

https://online.mephi.ru/

http://library.mephi.ru/

## 9.  LOGISTICAL SUPPORT

1. Симуляционный центр (64-301)

2. Фантом головы с пищеводом и желудком  (64-301)

3. Комплект зондов желудочных одноразовых и дуоденальных (64-301)

4. Стойка (штатив) для инфузионных систем (64-301)

5. Тренажер интубации с контроллером (64-301)

6. Фантом реанимационный (торс) с электрическим контроллером (64-301)

7. Фантом предплечья для внутривенных инъекций с дополнительным вкладышем  (64-301)

8. Фантом руки для внутривенных инъекций  (64-301)

9. Фантом мужской промежности для катетеризации мочевого пузыря (64-301)

10. Фантом женской промежности для катетеризации мочевого пузыря (64-301)

11. Катетеры Фолея и Нелатона (64-301)

12. Кровать функциональная механическая с матрасом и штативом для капельниц  (64-301)

13. Электрокардиограф ЭК12Т-01-Р-Д/141 (64-301)

14. Манекен сердечно-легочной реанимации Р4201CPR ВОЛОДЯ. Модификация 1 (64-301)

15. Учебный автоматический наружный дефибриллятор МУ0353 (64-301)

16. Мешок Амбу КД-МП-В (64-301)

17. Мышь, клавиатура  (Клиническая база)

18. Проектор SMART P109  (Клиническая база)

19. Кушетка медицинская (Клиническая база)

20. Монитор  (Клиническая база)

21. Медицинское оборудование для практической подготовки обучающихся, предусмотренное договором  (Клиническая база)

22. Иное оснащение, предусмотренное порядками оказания медицинской помощи по соответствующему профилю (Клиническая база)

23. Аппарат холетеровского мониторирования ЭКГ (64-301)

24. Аппарат суточного мониторирования АД (СМАД) (64-301)

25. Персональный компьютер (База клиническая)

## 10. EDUCATIONAL AND METHODOLOGICAL RECOMMENDATIONS FOR STUDENTS

The training consists of classroom activities, including lectures and clinical practical sessions, and independent study work. The main portion of instructional time is devoted to practical training aimed at developing skills in diagnosing critical conditions and providing first aid and resuscitation measures.

During the study of the discipline, students must learn the key critical conditions and acquire practical skills in first aid and resuscitative interventions.

Practical sessions are conducted in the format of discussions, demonstrations of patients in the intensive care unit, use of visual teaching aids, solving situational tasks, and clinical case reviews.

Active and interactive teaching methods are widely used (skills training on manikins and simulators, final assessment of practical skills on high-fidelity simulation manikins). At least 70% of classroom sessions are delivered in interactive formats.

Independent work includes preparation for classroom activities, extended review of lesson topics, preparation and presentation of a report or presentation on a specific topic, and preparation for intermediate testing.

Studying academic literature is considered part of the coursework for the discipline "Anesthesiology, Resuscitation, and Intensive Care" and is carried out within the hours allocated for independent study (SRS section).

Each student has access to the University and departmental library resources.

Working in groups fosters teamwork and communication skills.

Training also helps develop communication skills with virtual patients, taking into account ethical and deontological aspects of pathology.

Ongoing assessment of learning outcomes is conducted through oral questioning during classes, clinical discussions, solving standard situational tasks, and practicing cardiopulmonary resuscitation skills on training manikins.

At the end of the course, an intermediate assessment is conducted using a test-based evaluation and a practical skills examination on an electronic simulation manikin.

## 11. EDUCATIONAL AND METHODOLOGICAL RECOMMENDATIONS FOR TEACHERS

In organizing and conducting the educational process, the instructor must be able to plan and manage time effectively, which ensures proper distribution of teaching workload and is essential for successful instruction in the discipline.

The instructor should actively participate in the educational process and thoroughly prepare for it. Continuous preparation for lectures, seminars, and practical sessions is required to reflect current approaches, concepts, and scientific data related to the subject areas. Preparation for teaching must include reviewing up-to-date methodological guidelines, research findings, and new technologies.

The goal of the instructor's work is to ensure effective comprehension of the material by students. The following types of instructional activities are used: lectures, seminars, practical classes, and independent student work. When conducting various forms of instruction, the instructor should use modern educational technologies (interactive presentations, educational software, critical-thinking development technologies, including effective lecturing techniques, structured tables, group work, etc.).

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