

DANYLO HALYTSKY LVIV NATIONAL MEDICAL UNIVERSITY  
DEPARTMENT OF SURGERY № 1

"APPROVED"

First vice-rector  
on Educational and Pedagogical Affairs at  
Danylo Halytsky  
Lviv National Medical University  
associate professor I.I. Solonyenko



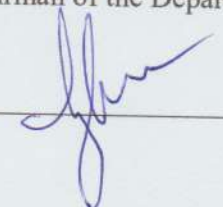
\_\_\_\_\_ 2023

WORK PROGRAM

"SURGERY" (Educational component 29.1)  
for training of specialists of the second (master's) level of high education  
branch of knowledge 22 "Healthcare"  
5<sup>th</sup>-year students of speciality 222 "Medicine"

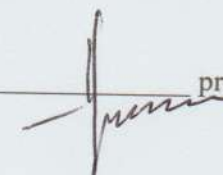
"APPROVED"

at the meeting of the Department of Surgery № 1  
meeting report № 15  
12 April 2023  
Chairman of the Department of Surgery № 1

 \_\_\_\_\_ prof. O.V. Lukavetsky


"APPROVED"

at the meeting of the Surgical Methodological  
Commission of Danylo Halytsky Lviv National  
Medical University meeting report № 20  
27 April 2023  
Chief of Surgical Methodological Commission

 \_\_\_\_\_ prof. V.P. Andriushchenko

"APPROVED"

Dean of Faculty of Foreign Students  
Danylo Halytsky  
Lviv National Medical University  
associate professor E.S. Varyvoda

 \_\_\_\_\_ 2023

Lviv 2023

In accordance with the Order of the Rector of Danylo Halytsky Lviv National Medical University "On the implementation of the training plan for applicants of the second (master's) level of higher education in the specialty 222 Medicine", No. 656-z dated February 15, 2023, changes were made to the Work Program of the academic discipline "Surgery" for students of the 5th year of the Faculty of General Medicine for the 2023-2024 academic year.

| Work sections           | Academic year      |                    |
|-------------------------|--------------------|--------------------|
|                         | 2022-2023          | 2023-2024          |
| Lectures (hours)        | <b>12</b>          | <b>12</b>          |
| Classes (hours)         | <b>64</b>          | <b>64</b>          |
| Outclasses work (hours) | <b>74</b>          | <b>74</b>          |
| Total amount of hours   | 150                | 150                |
| Credits                 | 5,0                | 5,0                |
| Number of Classes       | 16                 | 16                 |
| Form of control         | <b>Examination</b> | <b>Examination</b> |

#### DEVELOPERS OF PROGRAMME:

O.V. Lukavetsky, doctor of medical sciences, professor, Chairman of the Department of Surgery №1;

V.I. Kolomyitsev, doctor of medical sciences, professor of the Department of Surgery №1;

T.E. Babjak, candidate of medical sciences, associate professor of the Department of Surgery №1;

V.N. Marina, candidate of medical sciences, assistant professor of the Department of Surgery №1

V.V. Khomyak, candidate of medical sciences, associate professor of the Department of Surgery №1.

#### REVIEWERS:

I.I. Kobza, doctor of medical sciences, professor, Chairman of the Department of Surgery №2;

V.P. Andriushchenko, doctor of medical sciences, professor, Chairman of Department of General Surgery.

## 1. INTRODUCTION

### **Work program of the academic discipline "Surgery"**

in accordance with the Standard of higher education of the *second (master's) level*, branch of knowledge 22 "*Healthcare*", speciality 222 "*Medicine*" of the educational program of the *master of medicine*.

### **Description of the academic discipline**

"Surgery" is a branch of medical science that studies the etiology and pathogenesis of surgical diseases, develops and improves methods of early diagnosis, treatment and prevention, improves methods of correction of surgical diseases; develops measures aimed at shortening periods of temporary incapacity for work and reducing disability.

The academic discipline "Surgery" provides an opportunity for students of the medical faculty in the 4th year of study to acquire knowledge, skills and practical skills that enable the specialist to quickly and correctly navigate situations when patients have surgical pathology. Mastery of the discipline is based on knowledge acquired by students in the process of studying other basic medical subjects. When mastering the discipline "Surgery", it is rational to introduce into the educational process modern world developments and standards on the main issues of surgery with wide use of means of complex practical-oriented training.

Educational program for "Surgery" for the 5<sup>th</sup>-year students of speciality 222 Medicine was processed based on the typical curriculum of discipline "Surgery" for higher medical educational institutions of Ukraine III-IV accreditation levels, which have been prepared by staff of the Department of Surgery #4 of the Bogomolets National Medical University reference for the discipline of "Surgery", taking into account continuous typical program in the discipline "Surgery" from the 2008, typical programs of faculty, clinical surgery, the subject "Surgical Diseases" and program for the specialty of pediatric surgery 7.12010001 "General Medicine" in training field 1101 "Medicine".

The program was made in accordance with the following existing regulation documents:

- Educational Qualification Characteristics (EQC), Educational and Occupational Programs (EOP) of specialists' training are approved by order of Ministry of Education and Science of Ukraine (MES) 16.04.03 №239 "Approval of the components of education standards of 1101 " Medicine ";
- Experimental curriculum which is based on the principles of the European Credit Transfer System (ECTS) and approved by order of the Ministry of Healthcare of Ukraine №52, 31.01.2005 of "Approval and introduction of new curriculum of training of the educational-qualification level - " Specialist ", qualification - " Medical Doctor " at the high educational institutions of III-IV levels of accreditation of Ukraine of such specialties as "Curative Medicine" and "Stomatology";
- The recommendations of development of the curriculum which are approved by the Ministry of Healthcare of Ukraine March 24,2004, №152 "Approval of the recommendations of development of the curriculum of the educational subjects", are followed with changes and supplements which were introduced by the order of Ministry of Healthcare of Ukraine from 12.10.2004, №492 "Changes and supplements to the recommendations of development of the curriculum of the educational subjects";
- The order of the Ministry of Healthcare of Ukraine, 31.01.2003, №148 "The implementation measures of the Bologna Declaration of the high education and science";
- The instruction of evaluation system of learning activities of students in accordance with the credit-modular system of education (Medical education in the world and in Ukraine which was approved by the Ministry of Healthcare of Ukraine as a study

guide for teachers, masters, graduate and postgraduate education, Kyiv, Book-plus., 2005);

- The order of the Ministry of Healthcare of Ukraine, 17.05.2006, № 281 "The changes in the curriculum of training of the educational-qualification level - " Specialist ", qualification - "Medical Doctor" at the high educational institutions of III-IV levels of accreditation of Ukraine, approved by the Ministry of Healthcare of Ukraine from 31.01.05 № 52;
- The order of the Rector of the Danylo Halytsky Lviv National Medical University "On the implementation of the training plan for applicants of the second (master's) level of higher education in the specialty 222 Medicine", No. 656-z dated February 15, 2023

In the 5<sup>th</sup> year for students of General Medicine module provides study of "Thoracic, cardio-vascular and endocrine surgery".

**Chapter. Thoracic, cardio-vascular and endocrine surgery.**

*Subchapters:*

1. Thoracic, cardiac and endocrine surgery;
2. Vascular surgery.

**Objectives of academic discipline**

| Structure of the discipline   | Hours which include     |            |                   | SSW | Year of study | Type of control                               |
|---|-------------------------|------------|-------------------|-----|---------------|---|
|   | Total                   | Auditorium |                   |     |               |   |
|   |                         | Lectures   | Practical classes |     |               |   |
| Module 1: Thoracic, cardio-vascular, endocrine surgery<br>Subchapters:<br>1. Thoracic, cardiac and endocrine surgery<br>2. Vascular surgery | 150 hours/<br>5 credits | 12         | 64                | 74  | 5             | Current and final modul control (examination) |

Comment: 1 credit ECTS – 30 hours.

**The subject of study of the academic discipline** is the main manifestations of surgical diseases, diagnosis, differential diagnosis and the basic principles of treatment of patients with surgical pathology.

**Interdisciplinary connections:** human anatomy, topographical anatomy, operative surgery, general surgery, pathomorphology, pathological physiology, biochemistry, pharmacology, anesthesiology and intensive care.

**The purpose of studying of surgery** – learning theoretical and practical knowledge of the etiology, pathogenesis, typical and atypical clinical presentation, diagnostic methods, conservative and surgical treatment, and rehabilitation of surgical pathology, that meet general practitioner training considering its specialty features.

**Final objectives of the discipline:**

1. Identify the most common symptoms and syndromes in patients with surgical diseases.
2. Identify the major etiological and pathogenetic factors of the most common surgical diseases.
3. Demonstrate the ability to perform the required medical manipulations.

4. To demonstrate the moral and ethical principles of medical specialist and principles of professional subordination in surgery.
5. Diagnose and provide medical care in urgent conditions for patients with surgical diseases.
6. To carry out the prognosis of life and ability to work for the most common surgical diseases.
7. Classify and analyze the typical clinical picture of the most common surgical diseases.
8. Make up a plan of examination and analyze data from laboratory and instrumental investigations in patients with typical clinical course of the most common surgical diseases.
9. To explain the general principles of treatment, rehabilitation and prevention of the most common surgical diseases.
10. Identify tactics (principles of surgical interventions and conservative treatment, rehabilitation) with the most common surgical diseases and their complications.
11. To demonstrate the moral and ethical principles of medical specialist and principles of professional subordination in surgery.
12. Identify different clinical variants and complications of the most common surgical diseases.
13. Provide emergency medical care with the most common surgical diseases.
14. Plan examination of the patient, interpret the results of laboratory and instrumental examinations for the most common surgical diseases and their complications.
15. To carry out differential diagnosis, justify and formulate preliminary diagnosis of the most common surgical diseases.
16. Conduct primary and secondary prevention of the most common surgical diseases.
17. To determine a plan of conservative and operative treatment of surgical diseases depending on the pathogenetic factors and the severity of the patients condition.
18. Create a professional rehabilitation plan for patients with common surgical diseases.
19. Demonstrate the ability to conduct medical records at the clinic of surgical diseases.
20. To diagnose complicated and atypical forms of the most common surgical diseases.
21. Provide medical care in urgent conditions at the clinic of surgical diseases and perform urgent surgical manipulations and operations.
22. Planning scheme of examination of particular patient depending on the clinical features of the disease.
23. To carry out differential diagnosis of the most common surgical diseases in urgent and elective surgery.

According to the requirements of the Higher Education Standard, the discipline ensures that students acquire the following *competencies*:

### Competency matrix

| No                         | Competency  | Knowledge | Skills | Communication | Autonomy and responsibility |
|----------------------------|---|-----------|--------|---------------|-----------------------------|
| <b>General competences</b> |   |           |        |               |                             |
| 1.                         | Ability to abstract thinking, analysis and synthesis. | +         | +      | +             | +                           |
| 2.                         | Ability to learn and master modern knowledge.         | +         | +      | +             | +                           |
| 3.                         | Ability to apply knowledge in practical situations.   | +         | +      | +             | +                           |

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 4.  | Knowledge and understanding of the subject area and understanding of professional activity.   | + | + | + | + |
| 5.  | Ability to adapt and act in a new situation.  | + | + | + | + |
| 6.  | Ability to make informed decisions.   | + | + | + | + |
| 7.  | Ability to work in a team.  | + | + | + | + |
| 8.  | Ability to interpersonal interaction.   | + | + | + | + |
| 10.   | Ability to use information and communication technologies.  | + | + | + | + |
| 11.   | Ability to search, process and analyze information from various sources.  | + | + | + | + |
| 12.   | Determination and persistence in relation to assigned tasks and assumed responsibilities.   | + | + | + | + |
| 13.   | Awareness of equal opportunities and gender issues.   | + | + | + | + |
| 14.   | The ability to realize one's rights and responsibilities as a member of society, to be aware of the values of a civil (free democratic) society and the need for its sustainable development, the rule of law, the rights and freedoms of a person and a citizen in Ukraine.  | + | + | + | + |
| 15.   | The ability to preserve and multiply moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle. | + | + | + | + |
| <b>Professional competencies of the specialty</b> |   |   |   |   |   |
| 1.  | Ability to collect medical information about the patient and analyze clinical data.   | + | + | + | + |
| 2.  | Ability to determine the necessary list of laboratory and instrumental studies and evaluate their results.  | + | + |   | + |
| 3.  | Ability to establish a preliminary and clinical diagnosis.  | + | + | + | + |

|                                  |   |   |   |   |   |
|----------------------------------|---|---|---|---|---|
| 4.                               | The ability to determine the necessary regime of work and rest in the treatment and prevention of diseases.   | + | + | + | + |
| 5.                               | The ability to determine the nature of nutrition in the treatment and prevention of diseases.   | + | + | + | + |
| 6.                               | Ability to determine the principles and methods of treatment and prevention of diseases.  | + | + | + | + |
| 7.                               | Ability to diagnose emergency conditions.   | + | + | + | + |
| 8.                               | Ability to determine tactics and provide emergency medical care.  | + | + | + | + |
| 9.                               | Ability to carry out medical evacuation measures.   | + | + | + | + |
| 10.                              | Ability to perform medical manipulations.   | + | + | + | + |
| 11.                              | Ability to solve medical problems in new or unfamiliar environments in the presence of incomplete or limited information, taking into account aspects of social and ethical responsibility.   | + | + | + | + |
| 15.                              | The ability to conduct an examination of working capacity.  | + | + | + | + |
| 16.                              | Ability to maintain medical documentation, including electronic forms.  | + | + | + | + |
| 21.                              | Clearly and unambiguously communicate own knowledge, conclusions and arguments on health care problems and related issues to specialists and non-specialists, in particular to people who are studying.   | + | + | + | + |
| 24.                              | Adherence to ethical principles when working with patients and laboratory animals.  | + | + | + | + |
| 25.                              | Adherence to professional and academic integrity, to be responsible for the reliability of the obtained scientific results.   | + | + | + | + |
| <b>Program learning outcomes</b> |   |   |   |   |   |
| 1.                               | Have thorough knowledge of the structure of professional activity. To be able to carry out professional activities that require updating and integration of knowledge. To be responsible for professional development, the ability for further professional training with a high level of autonomy. |   |   |   |   |
| 2.                               | Understanding and knowledge of basic and clinical biomedical sciences, at a level sufficient for solving professional tasks in the field of health care.  |   |   |   |   |

|     |   |
|-----|---|
| 3.  | Specialized conceptual knowledge that includes scientific achievements in the field of health care and is the basis for conducting research, critical understanding of problems in the field of medicine and related interdisciplinary problems.  |
| 4.  | Identify leading clinical symptoms and syndromes (according to list 1); according to standard methods, using preliminary data of the patient's history, data of the patient's examination, knowledge about the person, his organs and systems, establish a preliminary clinical diagnosis of the disease (according to list 2).   |
| 5.  | Collect complaints, past medical history and history of the disease, assess the psychomotor and physical development of the patient, the state of organs and systems of the body, based on the results of laboratory and instrumental studies, evaluate information about the diagnosis (according to list 4), taking into account the age of the patient.  |
| 6.  | To establish the final clinical diagnosis by making a reasoned decision and analyzing the received subjective and objective data of clinical, additional examination, carrying out differential diagnosis, observing the relevant ethical and legal norms, under the control of the head physician in the conditions of the health care institution (according to the list 2).  |
| 7.  | Assign and analyze additional (mandatory and optional) examination methods (laboratory, functional and/or instrumental) (according to list 4), patients with diseases of organs and body systems for differential diagnosis of diseases (according to list 2).  |
| 8.  | Determine the main clinical syndrome or what causes the severity of the victim/victim's condition (according to list 3) by making a reasoned decision and assessing the person's condition under any circumstances (in the conditions of a health care facility, outside its boundaries), including in the conditions emergencies and hostilities, in field conditions, in conditions of lack of information and limited time.  |
| 9.  | Determine the nature and principles of treatment (conservative, operative) of patients with diseases (according to list 2), taking into account the age of the patient, in the conditions of a health care institution, outside its borders and at the stages of medical evacuation, including in field conditions, on the basis of a previous clinical diagnosis, observing the relevant ethical and legal norms, by making a reasoned decision according to existing algorithms and standard schemes, in case of the need to expand the standard scheme, be able to substantiate personalized recommendations under the control of the head physician in the conditions of a medical institution. |
| 10. | Determine the necessary mode of work, rest and nutrition of the patient based on the preliminary and/or final clinical diagnosis, observing the relevant ethical and legal norms, by making a reasoned decision according to existing algorithms and standards.   |
| 14. | Determine tactics and provide emergency medical care for emergency situations (according to list 3) in limited time conditions according to existing clinical protocols and standards.  |
| 15. | To organize the provision of medical aid and medical evacuation measures to the population and military personnel in emergency situations and combat operations, including in field conditions.   |
| 16. | Form rational medical routes for patients; organize interaction with colleagues in their own and other institutions, organizations and institutions; apply tools for the promotion of medical services on the market, based on the analysis of the needs of the population, in the conditions of the functioning of the health care institution, its division, in a competitive environment.  |
| 17. | Perform medical manipulations (according to list 5) in the conditions of a medical institution, at home or at work based on a previous clinical diagnosis and/or indicators of the patient's condition by making a reasoned decision, observing the relevant ethical and legal norms.   |
| 18. | To determine the state of functioning and limitations of a person's vital activities and the duration of incapacity for work with the preparation of relevant documents, in the conditions of a health care institution, based on data about the disease and its course, peculiarities of a person's professional activity, etc. Maintain medical documentation regarding the patient and the contingent of the population on the basis of regulatory documents.  |



|     |  |
|-----|--|
| 19. | Plan and implement a system of anti-epidemic and preventive measures regarding the occurrence and spread of diseases among the population.   |
| 21. | Search for the necessary information in the professional literature and databases of other sources, analyze, evaluate and apply this information.  |
| 22. | Apply modern digital technologies, specialized software, statistical methods of data analysis to solve complex healthcare problems.  |
| 25. | Clearly and unambiguously to convey one's own knowledge, conclusions and arguments on health care problems and related issues to specialists and non-specialists.  |
| 26. | Manage healthcare workflows that can be complex, unpredictable and require new strategic approaches; to organize the work and professional development of personnel taking into account the acquired skills of effective team work with adherence to leadership positions, appropriate quality, accessibility and fairness, ensuring the provision of integrated medical care. |
| 27. | Communicate freely in the national and English languages both orally and in writing to discuss professional activities, research and projects.   |
| 28. | Make effective decisions about health care problems, evaluate the necessary resources, take into account social, economic and ethical consequences.  |

### **Learning outcomes:**

Integrative final program learning outcomes, the formation of which is facilitated by the educational discipline: apply knowledge in practical situations; perform experimental research and demonstrate skills in professional subjects, adapt to new situations, work effectively both autonomously and as part of a team; to be responsible for the work performed in order to achieve the set goal; use information and communication technologies to solve various research and professional tasks; search for information in various sources to solve the problems of the specialty, make informed decisions with an assessment of their consequences, show the ability for public, business and scientific communications; adhere to the code of professional ethics, moral norms and values, rules of etiquette, understand the basic principles of labor protection and life safety in the field of professional activity; to have techniques for providing medical care for various types of surgical pathology; the ability to make a diagnosis, to choose appropriate medical and diagnostic manipulations, to provide emergency care to patients with surgical pathology.

Learning outcomes for the discipline: mastering the basic principles of organizing surgical care for the population of Ukraine, clinical and laboratory and additional methods of diagnosing surgical pathology of the body; etiology, pathogenesis, clinic, diagnosis and methods of treatment of surgical diseases (within the curriculum); etiological, pathogenetic factors, clinical manifestations and diagnosis of emergency conditions; emergency surgical care tactics; organization of medical evacuation measures; carrying out the main methods of the general clinical examination of the patient (survey, examination, palpation, auscultation), determining the scope of additional studies and analyzing the obtained data to establish a preliminary diagnosis; performing general medical manipulations (bandages, injections, gastric lavage, stopping bleeding, local anesthesia, etc.); providing the necessary assistance in case of short-term loss of consciousness, collapse, maintaining medical records.

## **2. INFORMATIONAL VOLUME OF THE ACADEMIC DISCIPLINE.**

5,0 ECTS credits (150 hours) are assigned to the study of the academic discipline.

**3. THE STRUCTURE OF THE ACADEMIC DISCIPLINE "SURGERY", SECTION "THORACIC, CARDIO-VASCULAR, ENDOCRINE SURGERY" SPECIALTY "GENERAL MEDICINE"**

| Topic  | Hours   |                   |     |
|--|---------|-------------------|-----|
|  | Lecture | Practical classes | SSW |
| <b>Subchapter "Thoracic, cardiac and endocrine surgery"</b>                                |         |                   |     |
| <b>Topic 1</b><br>Thoracic trauma.   |         | 4                 | 4   |
| <b>Topic 2</b><br>Purulent diseases of the lungs and pleura.                               | 2       | 4                 | 4   |
| <b>Topic 3</b><br>Ischemic heart disease.  |         | 4                 | 4   |
| <b>Topic 4</b><br>Acquired valvular heart disease.   | 2       | 4                 | 4   |
| <b>Topic 5</b><br>Surgical pathology of the mediastinum.                                   |         | 4                 | 4   |
| <b>Topic 6</b><br>Euthyroid and toxic goiter. Thyroid cancer.                              | 2       | 4                 | 6   |
| <b>Topic 7</b><br>Thyroiditis.   |         | 4                 | 4   |
| <b>Topic 8</b><br>Adrenal tumors.  |         | 4                 | 4   |
| <b>Topic 9</b><br>Breast diseases.   |         | 4                 | 4   |
| <b>Subchapter "Vascular surgery"</b>   |         |                   |     |
| <b>Topic 10</b><br>Aortic aneurisms.   |         | 4                 | 4   |
| <b>Topic 11</b><br>Acute and chronic extremity ischemia.                                   | 2       | 4                 | 8   |
| <b>Topic 12</b><br>Abdominal ischemic syndrome.  | 2       | 4                 | 4   |
| <b>Topic 13</b><br>Varicose veins of the lower extremities.                                |         | 4                 | 4   |
| <b>Topic 14</b><br>Thrombosis of large veins. Postthrombotic syndrome. Pulmonary embolism. | 2       | 4                 | 4   |
| <b>Topic 15</b><br>Lymphedema of the extremities.  |         | 4                 | 4   |
| <b>Topic 16</b><br>Inpatient medical record.   |         | 4                 | 8   |

|               |             |    |    |
|---------------|-------------|----|----|
| Total         | 12          | 64 | 74 |
| Final control | Examination |    |    |

**4. THEMATIC PLAN OF LECTURES OF THE ACADEMIC DISCIPLINE "SURGERY", SECTION "THORACIC, CARDIO-VASCULAR, ENDOCRINE SURGERY" SPECIALTY "GENERAL MEDICINE"**

| №     | TOPIC  | HOURS |
|-------|--|-------|
| 1.    | Surgical pathology of respiratory system. Medical aid out of hospital and in extreme situations.   | 2     |
| 2.    | Acquired valvular heart disease: methods of treatment. Coronary artery disease: methods of treatment. Aortic aneurisms: clinical picture, diagnosis, treatment             | 2     |
| 3.    | Acute and chronic mesenteric ischemia.   | 2     |
| 4.    | Endocrine surgery.   | 2     |
| 5.    | Modern methods of treatment of pulmonary embolism  | 2     |
| 6.    | Clinical signs, diagnosis and treatment of peripheral arteries disease. Diagnosis and treatment of acute and chronic diseases of the veins of lower and upper extremities. | 2     |
| Total |  | 12    |

**5. THEMATIC PLAN OF PRACTICAL CLASSES OF THE ACADEMIC DISCIPLINE "SURGERY", SECTION "THORACIC, CARDIO-VASCULAR, ENDOCRINE SURGERY" SPECIALTY "GENERAL MEDICINE"**

| №  | Topic   | Hours |
|--|---|-------|
| <b>Subchapter. Thoracic, cardiac and endocrine surgery</b> |   |       |
| 1.   | Thoracic trauma. Classification. Early and late complications. Differential diagnosis. The first medical aid and treatment strategy. Medical aid in the field and emergency situations.   | 4     |
| 2.   | Purulent diseases of lungs and pleura. Lung abscess and lung gangrene, bronchiectasis. Acute and chronic empyema, pneumoempyema. Features of clinical course. Differential diagnosis. Methods of conservative and surgical treatment. Indications and contraindications for lung transplantation. Storage and transportation of donor lung. | 4     |
| 3.   | Ischemic heart disease. Diagnostics. Indications for surgical treatment. Methods of surgery. Current methods of diagnosis, minimally invasive surgical treatment of heart disease. Limitation of the patient's functioning and vital activities.  | 4     |
| 4.   | Acquired valvular heart disease. Classification. Diagnosis. Indications for surgical treatment. Methods of surgery. Complications. Indications and contraindications for heart transplantation. Storage and transportation of donor heart. Limitation of the patient's functioning and vital activities.                                    | 4     |
| 5.   | Diseases of the mediastinum. Classification. Diagnosis. Differential diagnosis. Methods of surgical treatment. Disease and injuries of the oesophagus.  | 4     |
| 6.   | Euthyroid and toxic goitre. Classification. Special methods of examination. Diagnosis. Differential diagnosis. Preoperative preparation. Surgical treatment.  | 4     |

|                                     |  |    |
|-------------------------------------|--|----|
|                                     | Thyroid cancer. Classification. The clinical course. Diagnosis. Methods of treatment. Limitation of the patient's functioning and vital activities.  |    |
| 7.                                  | Thyroiditis. Classification. The clinical course. Diagnosis. Methods of treatment. Indications for surgical treatment.<br>Hyperparathyroidism: classification, symptoms, diagnosis, treatment.   | 4  |
| 8.                                  | Tumours of the adrenal glands. Classification. The clinical course. Diagnosis. Preoperative preparation. Methods of surgical treatment.  | 4  |
| 9.                                  | Diseases of the breast (dys hormonal, tumors). Mastitis.   | 4  |
| <b>Subchapter. Vascular surgery</b> |  |    |
| 10.                                 | Aneurysms of the aorta. Definition, causes. Classification, clinical picture, diagnosis and treatment.   | 4  |
| 11.                                 | Classification of acute ischemia of the extremities. Stages of clinical course. Diagnosis. Differential diagnosis. Methods of surgical treatment. Chronic lower limbs ischemia. Atherosclerosis and endarteritis. Classification of chronic ischemia and levels of occlusion of the aorta and lower limb arteries. | 4  |
| 12.                                 | Abdominal ischemic syndrome. Clinical course. Diagnosis. Differential diagnosis. Complications. Methods of conservative treatment. Prevention. Rehabilitation.   | 4  |
| 13.                                 | Varicose veins of the lower extremities. Classification. Complications. Diagnosis. Special methods of examination. Methods of surgical treatment.  | 4  |
| 14.                                 | Thrombosis of the large veins. Classification. Clinical signs. Diagnosis. Differential diagnosis. Methods of conservative and surgical treatment. Post thrombophlebitic syndrome. Classification. Diagnosis. Management. Pulmonary embolism. Symptoms, diagnosis and treatment. Methods of prevention.             | 4  |
| 15.                                 | Lymphedema of the extremities. Forms of the disease. Clinical signs. Diagnosis. Clinical course variants. Medical and surgical treatment.  | 4  |
| 16.                                 | Examination of patients. Inpatient medical record.   | 4  |
|                                     | Final module control (Examination)   | -  |
| Total                               |  | 64 |

**6. TOPICS OF STUDENTS' SELF-TRAINING WORK (INCLUDING INDIVIDUAL WORK) (OUTCLASSES WORK) OF THE ACADEMIC DISCIPLINE "SURGERY", SECTION "THORACIC, CARDIO-VASCULAR, ENDOCRINE SURGERY" SPECIALTY "GENERAL MEDICINE"**

| <b>№</b>  | <b>TOPIC</b>  | <b>HOURS</b> | <b>FORM OF CONTROL</b>               |
|-----------|---|--------------|--------------------------------------|
| <b>1.</b> | Preparation for practical classes – theoretical preparation and practical skills training<br>1.1 Surgical pathology of respiratory system.<br>1.2 Surgical pathology of heart.<br>1.3. Surgical pathology of mediastinum.<br>1.4 Surgical pathology of endocrine organs.<br>1.5 Surgical pathology of arteries.<br>1.6 Surgical pathology of venous and lymphatic system. | <b>32</b>    | Current control on practical classes |

|              |  |           |                                      |
|--------------|--|-----------|--------------------------------------|
| 2.           | Self study of topics not included in the plan of classes:<br>1. International classification of functioning, disability and health.<br>2. Diabetic foot.<br>3. Modern methods of vascular stenting.<br>4. Endoscopic coronary stenting.<br>5. Allotransplants in vascular surgery.<br>6. Laser surgery in angiology.                               | 20        | Final module control                 |
| 3.           | Individual independent work:<br>1. A review of scientific literature on topic by choice.<br>2. Participation in the writing of a scientific article or an essay on the topic.<br>3. Participation in student scientific group.<br>4. Participation in student scientific conference<br>5. Duty in the surgical department, examination of patients | 22        | Current control on practical classes |
| 4.           | <b>Preparations for final module control.</b>  | -         | Final module control                 |
| <b>TOTAL</b> |  | <b>74</b> |                                      |

7. **THE INDIVIDUAL EDUCATIONAL AND RESEARCH TASK** involves students writing an academic inpatient medical record and conducting its defense in a practical class, which is determined by the curriculum. The inpatient medical record is written as a generalization of the curation of patients in the basic surgical departments of the Department of Surgery No. 1, which according to nosologies correspond to the thematic plan of the educational discipline.

## 8. METHODS OF LEARNING

**The types of educational activity of students are:**

*A) Lectures, B) Practical training, C) Students' self-training work (SSW) (Outclasses work)* in the organization of which counseling teachers have a significant role. All topics which are a part of subject module are implemented by the thematic plan of lectures, practical training and SSW to the educational process. Topics of lectures reveal the problematic issues of corresponding sections of the discipline. Various teaching tools such as multimedia presentations, training films, slides, demonstration of patients cases are used throughout the lecture course.

**Practical classes include:**

- examination of patients with surgical diseases;
- study of the condition of vital organs and systems of patients;
- practical application of methods of diagnosis and surgical treatment;
- discussion of clinical cases and MCQs;
- mastering the elements of medical techniques on patients and medical simulators;
- training the skills of operative techniques during surgery and work in dressing rooms.

**Methodology of practical classes**

Classes, as recommended by the typical program, should be conducted at the department of surgery near the patients bed, in the dressing room, operating room, diagnostic rooms in small groups of students (4-6 persons). The results of examination of the patients, accuracy of the diagnosis, efficiency of treatment should be discussed by group (subgroup) of students in the training room under supervision of teacher. Students must write daily report with reflection of diagnosis, efficiency of methods of treatment and conducted manipulations.

The regular control of students training levels are supervised during practical classes according to specific goals.

It is planned to use following methods of determination of training level of students:

- answers to control questions
- MCQs on PC
- solving clinical cases
- evaluation and interpretation of the results of clinical, laboratory and instrumental examinations
- control of practical skills command

Assessment of students academic success from discipline is rating and exhibited by multi-scale based on mastering of the submodules.

The department made changes to the working curriculum within 15%, focusing on own organizational and technical capabilities, research areas, also made some changes to the thematic plan of practical classes that do not affect the claims of discipline in accordance with the ultimate goals of EQC and EOP in the direction of training and curriculum.

## **9. METHODOLOGICAL MATERIALS FOR MODULE "THORACIC, CARDIO-VASCULAR, ENDOCRINE SURGERY"**

### **A. List of theoretical questions**

1. Surgical aspects of the anatomy of the anterior mediastinum.
2. Clinical signs of tumors of anterior mediastinum.
3. Treatment of acute mediastinitis.
4. Etiology, pathogenesis, clinical course of superior vena cava syndrome.
5. Diagnosis of superior vena cava syndrome.
6. Surgical approaches during operations on the mediastinum.
7. The therapeutic approach to iatrogenic injury of the esophagus.
8. Treatment of iatrogenic perforation of the lower part of esophagus.
9. Surgical treatment of tumors of posterior mediastinum.
10. Classification of hiatal hernia.
11. The clinical course of a sliding hiatal hernia.
12. Radiographic signs of sliding hiatal hernia.
13. Treatment of sliding hiatal hernia.
14. Treatment of paraesophageal hiatal hernia.
15. Clinical manifestations of relaxation of the diaphragm.
16. Diagnosis of relaxation of the diaphragm.
17. Treatment of of total relaxation of the diaphragm.
18. Causes of acute lung abscess.
19. Clinical forms of gangrene of the lungs.
20. Clinical symptoms of not drained acute lung abscess.
21. Clinical symptoms of drained acute lung abscess.
22. Clinical signs of chronic lung abscess.
23. Additional methods of examination of patients with purulent lung diseases.
24. Differential diagnosis of chronic lung abscess and cancer with necrosis.
25. Differential diagnosis of air cysts and chronic lung abscess.
26. Methods of sanitation tracheobronchial tree.
27. Treatment of of gangrenous lung abscess.
28. Treatment of acute lung abscess. Indications for surgical treatment.
29. Tactics of treatment of complicated acute lung abscess.
30. Acute pleural empyema. Etiology, pathogenesis, clinical manifestations.
31. Clinical manifestations of limited pleural empyema. X-ray picture.
32. Clinical signs of limited pneumoempyema. Radiographic signs.
33. The total pneumoempyema. Etiology, clinical course.
34. Additional methods of examination in chronic suppurative processes in the pleura.

35. Differential diagnosis of pleural empyema and pneumoempyema.
36. Clinical signs of chronic pleural empyema.
37. Additional methods of examination in pneumoempyema.
38. The therapeutic approach in pneumoempyema.
39. Indications for puncture of pleural cavity.
40. The technique of puncture of pleural cavity.
41. Indications for thoracostomy.
42. Technique of thoracostomy.
43. Features of conservative treatment of limited pneumoempyema.
44. Classification of thoracic trauma.
45. Classification and diagnosis of posttraumatic hemothorax.
46. Therapeutic tactics in blunt thoracic trauma, small, medium and large hemothorax.
47. Signs of intrapleural bleeding. Indications for thoracotomy.
48. Therapeutic tactics in clotted hemothorax.
49. Diagnosis and treatment of penetrating wounds of the heart.
50. Classification of posttraumatic pneumothorax.
51. The causes of subcutaneous emphysema. Methods of treatment.
52. Causes and clinical course of mediastinal emphysema.
53. Treatment of mediastinal emphysema.
54. Treatment of posttraumatic pneumothorax. Types of aspiration systems.
55. Treatment of open pneumothorax.
56. Therapeutic tactics in tension pneumothorax.
57. Types of novocaine blockage in blunt thoracic trauma.
58. Methods of fixation of the thoracic wall in patients with flail chest.
59. Therapeutic tactics in patients with flail chest.
60. Clinical signs of double fracture of ribs.
61. Therapeutic tactics in patients with limited pneumothorax.
62. Early complications of blunt chest trauma.
63. Late complications of blunt chest trauma.
64. Clinical and radiological signs of small hemothorax.
65. Stages of mitral stenosis.
66. Clinical manifestations of I-II stage of mitral stenosis.
67. Complications of mitral stenosis.
68. Additional examination methods in mitral stenosis.
69. Surgical treatment of mitral stenosis.
70. Mitral regurgitation. Etiology. Classification.
71. Symptoms, diagnosis and treatment of mitral regurgitation.
72. Aortic stenosis. Symptoms, diagnosis and treatment.
73. The pathogenesis and complications of complete atrioventricular block.
74. Complete atrioventricular block. Clinical signs. Diagnosis.
75. Weakness of sinus syndrome. Indications for surgical treatment.
76. Types and indications for temporary electrocardiostimulation.
77. Indications for permanent electrocardiostimulation.
78. Coronary heart disease. Symptoms, diagnosis, surgical treatment.
79. Valvular heart disease. Symptoms, diagnosis, surgical treatment.
80. Anatomical and physiological narrowing of the esophagus
81. Clinical stage of achalasia of the esophagus.
82. Achalasia of the esophagus. Symptoms, diagnosis.
83. Results of objective examinations in esophageal achalasia.
84. Differential diagnosis of achalasia of the esophagus and esophageal cancer.
85. Treatment of I-II stages of achalasia.
86. Classification the diverticulum of the esophagus.

87. Complications of esophageal diverticulum. Therapeutic tactics.
88. Conservative and surgical treatment of achalasia of the esophagus.
89. Complications of bifurcational diverticulum of the esophagus. The clinical course.
90. Surgical approaches to esophageal diverticulum.
91. Surgical treatment of Zenker's diverticulum. Intraoperative and postoperative complications.
92. Clinical stage of esophageal burns.
93. First aid for burns of the esophagus.
94. Conservative treatment of burns of the esophagus.
95. Surgical approaches in operations on the esophagus.
96. Operations in patients with cicatricial strictures of the esophagus.
97. Surgical treatment of cicatricial strictures of the esophagus
98. Clinical signs of epiphrenal diverticulum. Additional methods of examination.
99. Causes of acute embolism and thrombosis of large arteries.
100. Clinical characteristics of acute embolism and thrombosis of large arteries.
101. Classification of acute ischemia of the lower extremities by V.S. Saveliev.
102. Differential diagnosis of acute embolism and thrombosis of large arteries.
103. Surgical tactics and methods of surgical treatment of acute embolism and thrombosis of large arteries.
104. Features of postoperative care after surgery for embolism and acute thrombosis of large arteries.
105. Indications for conservative treatment, medications used.
106. Anticoagulants, thrombolytic drugs.
107. Coagulation system control methods , their characteristics.
108. Etiology, pathogenesis of atherosclerotic lesions and endarteritis of lower extremities.
109. Classification of chronic ischemia and occlusion of of large arteries in patients with obliterating atherosclerosis by A.A. Shalimov.
110. The modern theory and risk factors for atherosclerosis.
111. Methods of examination of the arteries.
112. Complications of atherosclerosis obliterans arteries of lower extremities and methods of their prevention.
113. Definition, clinical characteristics and methods of surgical treatment of Leryshe syndrome.
114. Indications and contraindications for surgical treatment of atherosclerotic lesions of large arteries the lower extremities.
115. Indications and contraindications for surgical treatment of obliterative endarteritis of lower extremities.
116. Early postoperative complications of reconstructive operations on the large arteries of the lower extremities in patients with obliterating atherosclerosis and methods of their prevention.
117. Indications and contraindications for conservative treatment of obliterating diseases of lower extremities arteries.
118. Rehabilitation of patients who underwent reconstructive surgery on the aorta and large arteries.
119. Modern methods of aortoarteriography, complications aortography and methods of their prevention.
120. Methods of reduction of cholesterol and lipoproteins in blood plasma (pharmacological, instrumental).
121. Factors provide normal venous hemodynamics.
122. The etiology of varicose veins.
123. The pathogenesis of venous hemodynamics violation in patients with varicose veins.
124. Clinical characteristics of varicose veins of the lower extremities,



125. Clinical characteristics of chronic venous insufficiency stage I.
126. Clinical characteristics of chronic venous insufficiency stage II.
127. Clinical characteristics of chronic venous insufficiency stage III.
128. Complications of varicose veins.
129. Functional tests for determination of condition of valves of superficial veins, communicant and perforant valves of deep veins of lower extremities.
130. Methods and indications for phlebography.
131. Differential diagnosis of variceal vein in groin area and femoral hernia .
132. Differential diagnosis of varicose veins and congenital dysplasia of the veins.
133. Conservative treatment of varicose veins of lower extremities.
134. Treatment of eczema and dermatitis caused by chronic venous insufficiency.
135. Treatment of trophic ulcers caused by chronic venous insufficiency.
136. Indications and contraindications for surgical treatment of varicose veins of lower extremities.
137. Step by step algorithm of saphenectomy.
138. Causes of recurrence of varicose veins after saphenectomy.
139. Treatment of recurrent varicose veins after saphenectomy.
140. Prevention of varicose veins of lower extremities
141. Etiology of thrombophlebitis of superficial veins of the lower extremities.
142. Causes of thrombophlebitis of not changed saphenous veins.
143. Pathogenesis and clinical manifestations of migratory thrombophlebitis of subcutaneous veins.
144. Clinical manifestations of acute thrombophlebitis of superficial veins of the lower extremities.
145. Differential diagnosis of thrombophlebitis of superficial and deep veins of lower extremities.
146. Differential diagnosis of thrombophlebitis of superficial veins of the lower extremities and erysipelas.
147. Differential diagnosis of thrombophlebitis of superficial veins of the lower extremities and lymphangitis.
148. Treatment of post injection thrombophlebitis of subcutaneous veins of the upper extremities.
149. Conservative treatment of thrombophlebitis of subcutaneous veins of the lower extremities.
150. Indications and contraindications for surgical treatment of acute thrombophlebitis of superficial veins of the lower extremities.
151. Technique of operations for acute thrombophlebitis of subcutaneous veins of the lower extremities.
152. Etiologic and pathogenetic factors of deep veins thrombosis of lower extremities.
153. Clinical manifestations of venous thrombosis of the calf.
154. Clinical manifestations of ileofemoral thrombosis.
155. Clinical characteristics of phlegmasia alba dolens.
156. Clinical characteristics of phlegmasia cerulea dolens.
157. Clinical picture of thrombosis of the inferior vena cava.
158. Acute thrombosis of the hepatic veins (syndrome Budd-Chiari).
159. Etiology, clinical characteristics and treatment of Paget's-Shretter syndrome.
160. Differential diagnosis of deep veins thrombosis of lower extremities and lymphostasis.
161. Differential diagnosis of phlegmasia alba dolens and femoral artery embolism.
162. Conservative treatment of deep veins thrombosis of lower extremities.
163. Peculiarities of ileofemoral thrombosis surgical treatment.
164. Ways of prevention of pulmonary embolism in the surgical treatment of ileofemoral thrombosis.

165. Prevention of deep veins thrombosis of lower extremities in the early postoperative period.
166. Etiology and pathogenesis of post-thrombotic syndrome.
167. Peculiarities of venous hemodynamics in patients with post-thrombotic syndrome.
168. Clinical characteristics of sclerotic forms of post-thrombotic syndrome.
169. Clinical characteristics of varicose form of post-thrombotic syndrome.
170. Clinical characteristics of swelling and pain form of post-thrombotic syndrome.
171. Clinical characteristics of ulcerative form of post-thrombotic syndrome.
172. Pathogenesis of occurrence of trophic ulcers in patients with post-thrombotic syndrome.
173. Peculiarities of clinical symptoms in patients with ileo-femoral post-thrombotic syndrome.
174. Differential diagnosis of post-thrombotic syndrome and lymphostasis.
175. Differential diagnosis of post-thrombotic syndrome and congenital angiodyplasia.
176. Conservative treatment of post-thrombotic syndrome.
177. Peculiarities of post-thrombotic syndrome surgical treatment of deep veins of lower extremities.
178. Surgical treatment of patients with ileo-femoral post-thrombotic syndrome.
179. Etiology of lymphostasis.
180. Pathogenesis of lymphostasis.
181. Clinical characteristics of lymphedema stages.
182. Clinical characteristics of fibroedema stages.
183. Differential diagnosis of lymphedema and edema in patients with congestive heart failure.
184. Differential diagnosis of lymphedema and edema in patients with renal diseases.
185. Differential diagnosis of lymphostasis of lower extremities (post-thrombotic syndrome, varicose veins, venous thrombosis of lower extremities).
186. Methods of examination of lymphatic system.
187. Indications and methods for performing lymphography.
188. Indications and methods of conservative treatment of lymphostasis.
189. Types of surgical interventions directed at restoring the outflow of lymph.
190. Surgical treatment lymphostasis in fibroedema stage.

## **B. Practical skills**

1. Pleural puncture.
2. Thoracocentesis and drainage of the pleural cavity.
3. Passive chest drainage.
4. Rouviellois-Gregoire test: conduction and interpretation.
5. Pericardiocentesis.
6. Setting intravenous catheter.
7. Temporary stopping of external bleeding.
8. Catheterization of the bladder in men and women.
9. Tracheostomy.
10. The interpretation of laboratory and instrumental investigations.
11. Clinical breast examination.
12. Thyroid gland palpation.
13. Determination of Algovver's index.
14. Lee-White clotting time: conduction and interpretation.
15. Determination of ABO blood groups and Rh factor.
16. Blood transfusion tests.
17. Puncture of peripheral vein, installation of transfusion system.
18. Venesection procedure.
19. Measurement of central venous pressure.

20. Suprapubic puncture of the bladder.
21. Trendelenburg test: conduction and interpretation.
22. Pratt test: conduction and interpretation.
23. Delbe – Perthes test: conduction and interpretation.
24. Examination of the peripheral arterial pulse on the upper and lower extremities.
25. Ankle-brachial index: conduction and interpretation.
26. Seldinger technique for catheterization of the femoral artery.
27. Cardiopulmonary resuscitation : airway patency.
28. Cardiopulmonary resuscitation : ventilation.
29. Cardiopulmonary resuscitation : chest compressions.
30. Surgical instruments : surgical needles (cutting, stitching, non-traumatic), hemostatic clamps, scalpels, scissors, suturing devices , Fogarty catheter, fleboextractor.

## 10. FORMS OF CONTROL

Forms of control and evaluation system is carried out according to the requirements of the discipline program and instruction of the system of evaluation of learning activities of students in credit-modular system of educational process, approved by the Ministry of Healthcare of Ukraine (2005).

Mark for the discipline is determined based on the results of the current study and evaluation of students assimilation of the separate modules according to the Act on rating system of evaluation of learning activities of students in High Medical (Pharmaceutical) Educational Establishments in Ukraine. In carrying out all types of control (at each class, on the final class of semantic modules, on the final module control) will be applied objective methods for evaluating the level of knowledge and practical skills – MCQs for theoretical knowledge, individual control of students actions, complicated clinical cases.

Mark for the module is defined as the sum of the scores of current educational activity (in points) and assessment of the final module control (in points), which is calculated on the basis of assessment of theoretical knowledge, practical skills and professional abilities, according to the lists specified by discipline program.

Maximum points awarded to student during each module (examination credit) equals 200 points, including: current study control – 120 points (60%), results of the final module control – 80 points (40%).

**Current study control** carried out at each class according to the specific goals of each topic. In evaluating the learning activities of students is planned use of standardized methods of control: MCQs solving, structured written answers on open questions, control of conduction of practical skills.

### Evaluation of current study:

The share of each topic within a module is the same but may be different for different modules of single discipline. Evaluation of current educational system of students is described in the study program of the discipline. During each class of the module for current study student gets marks: "5" (excellent), "4" (good), "3" (satisfactory), "2" (unsatisfactory).

**Mark "5" (excellent)** – gets student who deeply and reliably learned program material, thoroughly, consistently, competently and methodically explains theoretical knowledge, in whose answers theory is closely related with practice. The student does not hesitate to answer on modified tasks, easily cope with the clinical cases and questions of the second and third level of knowledge assessment, shows acquaintance with monographic literature, correctly justifies the decision, possesses elements of doctors abilities, skills and techniques of practical work. Practical skills performs without error, in professional activities can efficiently use the acquired knowledge.

**Mark "4" (good)** – gets student who knows program material correctly and essentially explains it, who does not make significant errors in responses to questions and in carrying out the necessary practical skills.

**Mark "3" (satisfactory)** – gets student who has knowledge of the basic material only, but does not learned details, not correctly formulate answers, has difficulties in performing practical skills or performs them with significant errors, has difficulties in solving clinical cases of the third level of knowledge control.

**Mark "2" (unsatisfactory)** - gets student who does not know a large part of the program material, makes substantial errors, uncertainly executes practical works, does not solve II-III level tasks of control.

**Maximal amount of points that can be collected by student for current study is 120 points.**

Putted by traditional evaluation scale marks are converted into points depending on the number of classes in the module. For Module 1 "Thoracic, cardiovascular, endocrine surgery" conversion of traditional scale to grade will be as follows

| Traditional marks | Points of a rating scale |
|-------------------|--------------------------|
| „5”               | 6                        |
| „4”               | 5                        |
| „3”               | 4                        |
| „2”               | 0                        |

#### **Evaluation of students self-training work:**

Evaluation of self-training work of students, which is foreseen in the topic along with the audience work, carried out during the current control relevant to the topic of auditorium classes. For the self-training work student can get additional from 1 to 6 points.

Evaluation of self-training work topics, which are not included to the topics of auditorium classes, should be carried out during the final module control.

#### **Final module control:**

Final module control is carried out on completion of all topics at the last class in module.

Students, who completed all types of work provided by discipline program and scored amount of points not less than the minimum, allowed for final testing.

**The minimal amount of points for access to the final module control on "Thoracic, cardiovascular, endocrine surgery" is 72 points (60.0 %).**

The form of the final module control will be standardized and include control of theoretical and practical training. The specific forms of the final module control are defined in the discipline program. Maximal amount of points for the final module control is 80.

The **final module control** is passed if the student scored at least **50 points**.

#### **The approximate structure of the final module control for 5<sup>th</sup>-year students**

| №  | Forms of control                                    | Place of control                |
|----|---|---------------------------------|
| 1. | Student shows how to perform three practical skills | Dressing room or Training class |
| 2. | Solution of 50 MCQs                                 | Lecture hall                    |
| 3. | Solution of 3 clinical cases                        | Lecture hall                    |

**Note:** practical skills – 0-2-3-5 points, 1 MCQ – 1 point, 1 clinical case – 0-2-3-5 points.

**Evaluation of discipline:**

Mark for discipline is assigned only to students who have completed all modules of discipline.

Mark for the discipline is set as the average scores of all modules.

Encouraging points according to the decision of the Academic Council may be added to the number of points of the discipline for students who have taken a scientific publication or prize places for participating in the competition on discipline among universities in Ukraine and more.

Objectivity of evaluation of learning activities of students must be tested by statistical methods (correlation coefficient between the current study and results of the final module test), correlation analysis is performed using Spearman's rank correlation coefficient

$$r = 1 - \frac{\sum s}{n}$$

where s - the difference between the ranks of each option on two grounds correlation; n - the number ranked signs in one statistical row.

**Conversion of points of discipline in rating on a scale ECTS and a four-points scale (traditional):**

The number of points of the discipline, which accrued student, converted to ECTS scale as follows:

| Mark ECTS | Statistical index    |
|-----------|----------------------|
| A         | Best 10% of students |
| B         | Next 25% of students |
| C         | Next 30% of students |
| D         | Next 25% of students |
| E         | Last 10% of students |

Percentage of students is determined among all students of the course within a corresponding specialty. Students who have been assessed FX, F ("2") are not ranked even after retaking the module. These students will automatically receive points E after retaking the module.

Mark on discipline FX, F ("2") is assigned to students who have not passed at least one module on discipline after completion of the study.

Mark FX ("2") assigned to students who score a minimum number of points for current educational activity, but not passed the final module control. They have the right to repeat the final module control, but not more than 2 (two) times according to the schedule approved by the Academic department. Mark F is assigned to students who attended all classes of module, but did not receive the minimal number of points for current educational activity and does not admitted to the final testing. This category has the right to re-study module.

Assessment of students of the discipline is rating and is calculated by multi-scale marks as the arithmetic mean score of mastering appropriate modules and a determination by the ECTS system and the traditional scale accepted in Ukraine.

The number of points for the discipline that accrued students converted to a four-point scale by absolute criteria as explained in the table below:

| Points for discipline  | Mark according to four-point scale |
|------------------------|------------------------------------|
| From 170 to 200 points | excellent (5)                      |
| From 140 to 169 points | good (4)                           |
| From 126 to 139 points | satisfactory (3)                   |
| Less then 126          | unsatisfactory (2)                 |

Evaluation of ECTS in traditional is not converted as ECTS scale and four-point scale are independent.

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