FACULTY OF MEDICINE

STUDY PROGRAM S.07.O.056 MEDICINE

DEPARTMENT OF INTERNAL MEDICINE

APPROVED
at the meeting of the Quality Assurance and Curriculum Evaluation Committee of the Faculty of Medicine
Protocol no. 5 of 04.04.24
President, MD., PhD, associate professor

Pădure Andrei _____

APPROVED
at the Medicine Faculty Council meeting
Protocol no. 8 of 23.04.24
Dean of the Medicine nr.1 Faculty, MD., PhD, associate professor

Plăcintă Gheorghe _____

APPROVED
at the meeting of the Discipline of Pneumology and Allergology

Protocol no._7_ of __22.03.2024_____

Head of department, MD.,PhD professor.

Corlăteanu Alexandru_____
(signature)

SYLLABUS

DISCIPLINE OF PNEUMOLOGY and ALLERGOLOGY

Integrated studies

Type of course: **Compulsory**

Curriculum developed by the group of authors:

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I. INTRODUCTION

- **General presentation of the discipline: the place and role of the discipline in shaping the specific competencies of the professional training program/specialization.**

Pneumology is an integrative, interdisciplinary medical discipline, one of the core specialties in the university training of physicians regardless of the specialty they will choose later. Pulmonary diseases are among the most common health problems encountered in medical practice. Thus, a profound understanding of pneumology is essential for efficiently diagnosing and treating a variety of conditions. Lung diseases can have a significant impact on patients' quality of life and can lead to serious complications or even death. Solid knowledge in pneumology allows for the early identification of these conditions and the application of appropriate treatment to improve prognosis and quality of life. Pneumology requires strong skills in interpreting radiological images, respiratory function tests, and other specific investigations. These competencies are fundamental for accurate diagnosis and appropriate therapeutic planning. Since pneumology is one of the main pillars of internal medicine, studying this field is essential for the comprehensive training of future physicians. Understanding the functioning of the respiratory system and associated diseases is fundamental to medical practice in any specialty. Studying pneumology in university medical education is essential for the comprehensive training of future healthcare professionals. Solid knowledge in this field is crucial to ensure quality care and improve clinical outcomes for patients.

In the epidemiological context of the Republic of Moldova, studying Pulmonology during the university stage will allow future physicians to grasp the basic principles in managing patients with respiratory tuberculosis. Thus, knowledge of Pulmonology contributes to the formation of a holistic medical conception and complex application skills.

Acquiring knowledge of allergic conditions creates premises for a better understanding of the physiopathological processes underlying the interaction of the immune system with extrinsic or intrinsic stimuli. Additionally, studying allergology will enable the development of competencies necessary to identify suggestive signs and resolve emergency situations, establish a correct diagnosis based on clinical and paraclinical examination, and acquire elements of prophylaxis and treatment for allergic pathology.

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

Consolidating knowledge and developing the skills necessary to establish the diagnosis, treatment, and prevention of pulmonary pathology, tuberculosis, allergic conditions, as well as the social reintegration of these patients.

- Language(s) of instruction for the discipline: Romanian, English, Russian, French;

- Beneficiaries: 4th year students, Faculty of Medicine 1 and 2, Medicine specialization.

II. ADMINISTRATION OF THE DISCIPLINE

Discipline code		**S.07.O.056, S.07.O.057, S.07.O.055**	
Title of the discipline		**Pneumology and Allergology**	
Person(s) in charge of the discipline		**Alexandru Corlăteanu MD., PhD, professor**	
The year	**N**	Semester/Semesters	**7/8**
Total number of hours, including:			**240**
Lectures	**46**	Practical/laboratory work (only one left)	**46**
Seminars	**46**	Self-training	**102**
Evaluation form	**E**	Number of credits	**8**

III. TRAINING OBJECTIVES WITHIN THE DISCIPLINE

At the end of studying the subject, the student will be able to:

- ***at the level of knowledge and understanding:***
  - ✓ to know and use adequately the notions specific to the discipline of pneumology
  - ✓ to know the theoretical bases of non-specific lung pathologies as well as the spectrum of lung conditions caused by tuberculosis.
  - ✓ to correlate the morphological aspects of pulmonary and allergic pathologies with the clinical ones
  - ✓ to know the pathogenesis, clinical features, diagnosis, differential diagnosis, principles of treatment and prophylaxis of various pathologies of the respiratory system as well as allergy;
  - ✓ to understand the importance of studying diseases of the respiratory system, including tuberculosis, in the current epidemiological conditions;
  - ✓ to acquire the knowledge related to the clinical and therapeutic aspects of diseases of the respiratory system
  - ✓ to know and use adequately the notions specific to the discipline of allergology
  - ✓ to acquire the knowledge related to the clinical and therapeutic aspects of allergic diseases
- ***at the application level:***
  - ✓ to clinically evaluate the patient with pulmonary and allergic diseases by observing the stages of history, physical examination, interpretation of clinical data (formulation of clinical diagnosis), indication, argumentation and interpretation of explorations, formulation of diagnosis;
  - ✓ to know the basic radiological syndromes in the interpretation of the chest X-ray both in terms of non-specific pulmonary pathology and those related to pulmonary and extrapulmonary tuberculosis, computed tomography, spirometry, body plethysmography, blood gas analysis, pleural puncture and biopsy, bronchoscopic and thoracoscopic examination, administration of drugs by inhalation, method of application of tuberculin intradermal reaction (Mantoux 2UT) and the interpretation of the results, to know the practical aspects of the interpretation of skin and "in vitro" allergy tests

- ✓ to accumulate behavioral skills in emergencies due to allergy: asthma attack, anaphylactic shock
- ✓ to accumulate skills to manage cases of emergency in pulmonology: foreign bodies in the upper airways, hemoptysis, pneumothorax, asthma attack, etc., but also allergy: anaphylactic shock
- ✓ To develop scientific research projects in the field of pneumology and allergology
- ✓ To apply the methods of prophylaxis of pulmonary pathologies including tuberculosis in practice, but also of allergic diseases;
- ✓ to solve the problems of the situation, applying the acquired information multilaterally and critically.

- ***at the integration level:***
  - ✓ integrate the basics of morphopathology, physiopathology, pharmacology and semiology in the context of respiratory system pathologies
  - ✓ to develop clinical argumentation, based on the principles of syndromal diagnosis, inter-syndromal differential diagnosis of various entities
  - ✓ to creatively approach the problems of clinical medicine
  - ✓ to integrate theoretical knowledge in pulmonology in clinical context
  - ✓ to deduce interrelationships in pneumology, phthisiology and allergology with other medical disciplines (oncology, hepatology, rheumatology, intensive care)
  - ✓ to be able to assimilate new achievements in clinical disciplines

IV. PROVISIONAL TERMS AND CONDITIONS

To acquire the discipline of pneumology and allergology, the following are required:

- ✓ knowledge of the language of instruction
- ✓ digital skills (using the Internet, processing documents, spreadsheets and presentations);
- ✓ communication and teamwork skills;
- ✓ qualities – tolerance, compassion, autonomy.
- ✓ deep knowledge in fundamental sciences: anatomy of the respiratory system, anatomy of the cardiovascular system (large circulation, small circulation), human morphopathology, physiology and physiopathology (breathing physiology, breathing regulation, breathing mechanics, compensatory mechanisms), microbiology (etiological agents with connotation in pulmonology , microbiological and molecular techniques used to identify germs), medical semiology of the respiratory system, clinical immunology, etc.

V. TOPICS AND ESTIMATE ALLOCATION OF HOURS

Courses (lectures), practical work/laboratory work/seminars and individual work

No. do	TOPIC	Number of hours		
		Lectures	Practical work	Self-training
1.	Clinical approach to the patient with respiratory diseases	3	2	4
2.	Pulmonary radiological syndromes	3	2	4
3.	Acute and chronic bronchitis. Bronchiectasis	2	2	3

No. do	TOPIC	Number of hours		
		Lectures	Practical work	Self-training
4.	COPD	2	2	3
5.	Obstructive sleep apnea	2	2	2
6.	Bronchial asthma	4	2	4
7.	Pneumonia	4	2	4
8.	Pulmonary suppurations. Lung cancer	2	2	2
9.	Interstitial lung diseases	2	2	4
10.	Pleurisies	2	2	4
11.	Pulmonary hypertension. *Cor pulmonale*	2	2	4
12.	Respiratory failure	2	2	4
13.	Etiology, epidemiology and pathogenesis of tuberculosis.	2	-	2
14.	Detection and diagnosis of tuberculosis. Treatment of tuberculosis.	2	-	2
15.	Latent tuberculous primary infection. Features of primary tuberculosis. The primary tuberculous complex. Tuberculosis of the intrathoracic lymph nodes. Complications of primary tuberculosis.	2	1	2
16.	Secondary pulmonary tuberculosis (disseminated, nodular, infiltrative, cavitary). Clinical features, differential diagnosis.	2	1	2
17.	Prophylaxis of tuberculosis. TB infection control. The patient-centered model of medical care for tuberculosis patients.	2	-	2
18.	Acquiring the skills and methods of examination of the tuberculosis patient: clinical and paraclinical investigation. Classification of tuberculosis. Tuberculin test. Microbiological and radiological examination. Treatment.	-	2	5
19.	Examination and evaluation of examination results of patients with primary tuberculosis. Diagnosis and treatment. Clinical discussion of patients with primary tuberculous complex, tuberculosis of the intrathoracic lymph nodes. Complications of primary tuberculosis: pleurisy, meningitis, atelectasis.	-	2	5
20.	Examination and evaluation of examination results of patients with secondary pulmonary tuberculosis (disseminated TB, nodular TB). Diagnosis and treatment. Clinical discussion of patients with secondary pulmonary tuberculosis.	-	2	5
21.	Prophylaxis of tuberculosis. Epidemiological investigation. TB infection control. Tuberculosis control in primary care. The joint activities of Public Health centers, phthisiopneumology services and primary medicine in the control of tuberculosis.	-	2	5
22.	Elements of immunology. Hypersensitivity reactions. Urticaria and angioedema	2	2	8
23.	Drug allergy	1	2	8

No. do	TOPIC	Number of hours		
		Lectures	Practical work	Self-training
24.	Food allergy. Anaphylaxis	2	3	8
25.	Allergic rhinitis	1	2	6
26.	Management of emergency cases in pulmonology and allergology	-	1.5	-
27.	Acquisition of practical skills in performing diagnostic tests in pulmonology and allergology	-	1.5	-
Total		**46**	**46**	**102**

VI. PRACTICAL TOOLS ACQUIRED AT THE END OF THE COURSE

The mandatory essential practical skills are:

- Identifying the clinical signs of pulmonary consolidation syndrome.
- Identification of clinical signs of liquid pleural syndrome.
- Identifying the clinical signs of air pleural syndrome.
- Identification of clinical signs of bronchial syndrome.
- Identifying the clinical signs of hyperinflation syndrome.
- Identification of clinical signs suggestive of acute/chronic hypoxemia.
- Identification of clinical signs of pulmonary hemorrhage
- Identification of clinical signs of obstructive syndrome.
- The presentation in order of priority of the necessary investigations with the specification of the expected result for arguing the diagnosis in a patient with lung lesions (bronchial asthma, pneumonia, COPD, lung abscess, lung cancer, pulmonary tuberculosis, sarcoid, etc.)
- Interpretation of deviations in hematological and biochemical constants in a patient with lung lesions (consolidation, pleural fluid, pleural air, hyperinflation, cavitary, interstitial, etc.)
- Bacterioscopic and bacteriological examination of sputum: indications, collection technique, interpretation
- Bacterioscopic, bacteriological and molecular examination of sputum to identify tuberculosis infection (indications, collection technique, interpretation)
- The principles, performance technique, interpretation of tests for latent tuberculosis, sensitivity and specificity (performance and interpretation of tuberculin skin test, IGRA test).
- Pleural fluid examination: indications, collection technique, interpretation
- Interpretation of chest imaging results (radiography, HRCT) in various lung pathologies, highlighting elementary radiological changes and main radiological syndromes in chest pathology
- Pulse-oximetry: performance technique, interpretation of results
- The 6-minute walk test: performance technique, pathologies in which it is applied, interpretation.
- Spirometry: performance technique, assessment of the type of ventilatory dysfunction according to the data obtained.
- Spirometry with bronchodilator test: performance technique, assessment of the type of obstruction according to the data obtained.
- Body plethysmography: assessment of the type of ventilatory dysfunction according to the results obtained.

- Measuring the diffusion capacity of gases: the principles of the method, the performance technique, the interpretation of the results.
- How to use the peak-flow-meter. PEF-metry and PEF-metry with bronhodilator test: performance technique, interpretation of results
- Arterial blood gases analysis: principles of the method, interpretation of results.
- Thoracentesis: performance technique, indications, particularities.
- Bronchoscopy and endoscopic specimen collection techniques. Performance technique, interpretation of results.
- Bronchoalveolar lavage: performance technique, indications, interpretation of results
- Ultrasound examination in pulmonary pathology: performance technique, interpretation of results.
- Polysomnography: performance technique, interpretation of the tracks from the polysomnograph.
- ECG: performing technique, interpretation of results with identification of echographic signs suggestive of *cor pulmonale*
- Echocardiography: interpretation of results with the identification of echographic signs suggestive of *cor pulmonale*, pulmonary hypertension
- Susceptible TB treatment regimens
- Knowing the indications and contraindications in immunization with the BCG vaccine, the appreciation of normal reactions after BCG vaccination, possible complications and the causes of their development in immunization with the BCG vaccine
- Knowledge of the criteria for assessing TB outbreaks
- Knowledge of TB outbreak remediation measures
- acquisition of TB contact examination
- knowledge of infectious control in TB (managerial, engineering and personal protection)
- the use and implementation of knowledge in the positive diagnosis of different clinical forms of TB
- Examining a patient with allergic pathology, detecting clinical syndromes, arguing the diagnosis.
- Recognition of different morphological types of skin elements encountered in allergic pathology.
- Interpreting the results of an allergen panel.
- How to perform skin tests (patch test, prick test, scratch test, intradermal test), reading and interpreting their results, the advantages and disadvantages of each method.
- Description of the principle and technique of performing challenge tests, interpretation of their results.
- Description of the principle and technique of carrying out the specific desensitization treatment.
- Knowledge of the emergency medical aid protocol in case of anaphylactic shock.
- Knowledge of the medical aid protocol in case of laryngeal angioedema.

VII. REFERENCE OBJECTIVES AND CONTENT UNITS

Objectives	Content units
Theme (chapter) 1.Approach to the patient with respiratory diseases	
- **To define** the main clinical pulmonary syndromes - **To know** physical landmarks of clinical pulmonary syndromes (inspection, palpation, percussion, auscultation)as well as laboratory and	- **The main clinical pulmonary syndromes**: pulmonary condensation syndrome, hyperinflation syndrome, pleural fluid syndrome, air pleural syndrome, mixed pleural syndrome, cavitary syndrome, atelectasis syndrome. - **Functional symptoms in lung diseases and their clinical connotations**: cough, sputum character, hemoptysis, chest pain, dyspnoea

Objectives	Content units
instrumental investigations used in pulmonology - **To demonstrate** the ability to integrate a clinical syndrome with the results of paraclinical investigations into a clinical diagnosis - **To apply** list of dexterities and maneuvers in the patient - **To integrate** knowledge in the fields of fundamental preclinical disciplines (anatomy, pathological anatomy, microbiology) and clinical ones (medical semiology)	- **The spectrum of paraclinical investigations used in pulmonology**: - microscopic examination of sputum, microbiological examination of sputum, molecular-genetic tests, - serological exploration, - endoscopic methods of exploration: laryngoscopy, bronchoscopy, EBUS, EUS; - pathological lung tissue sampling methods: transbronchial biopsy, liquid biopsy (bronchoalveolar lavage), brush-biopsy, cryobiopsy, EBUS-TBNA, transthoracic lung biopsy, VATS, thoracotomy, thoracentesis, pleural biopsy, mediastinoscopy. - histopathological and histological examinations, - pulmonary functional exploration: PEF-metry, spirometry (including the bronchodilator test), bodyplethysmography, gas diffusion capacity – functional patterns - assessment of gas exchange: pulse oximetry, arterial gasometry
Topic (chapter) 2.Imaging methods of pulmonary exploration	
- **To define** pulmonary radiological syndromes - **To know** elements of normal chest radiology and recognize pathological radiological signs - **To demonstrate** the ability to identify the radiological syndrome on a radiograph or computed tomography, to draw up a differential diagnosis list with entities presenting with a similar radiological picture - **To apply** the signs of the radiological syndrome in a clinical context - **To integrate** fundamental knowledge of the anatomy and physiology of the respiratory system, with radiological imaging techniques	- **Chest X-ray**. Elements of normal radiology. Modes of exposure of a radiograph. Anatomical landmarks on a normal radiograph. Pulmonary radiological syndromes and their signs: pulmonary condensation syndrome, pulmonary hyperinflation syndrome, fluid pleural syndrome, air pleural syndrome, mixed pleural syndrome, mediastinal syndrome, cavitary syndrome, interstitial syndrome, bronchial syndrome - **Chest computed tomography**. Anatomical landmarks. Computed tomography with contrast. Computed tomography in angioscan mode. Recognition of the main pathological elements. Indications and interpretation. - Thoracic ultrasound. Role and areas of application in pulmonary pathology. - **Exploration with radionuclides**. Ventilation-perfusion scintigraphy - **PET-CT**. Principles. Indications. Interpretation. False positive, false negative results.
Topic (chapter) 3.Acute and chronic bronchitis. Bronchiectasis	
- **To define** nosological entities listed emphasizing the basic landmarks of each definition according to nosology - **To know** clinical features, the spectrum of pathogens in the etiological structure, the stages of laboratory and instrumental paraclinical diagnosis, as well as drug groups and treatment principles - **To demonstrate** the ability to identify changes in paraclinical tests and interpret them in a clinical context, as well as distinguish nosological entities from each other and list diagnostic methods of certainty - **To apply** knowledge related to PEF-metry, spirometry, bronchodilator	1. **Acute bronchitis:**Definition, epidemiology, etiology, pathogenesis, clinical picture, paraclinical investigations, differential diagnosis, evolution, complications, treatment, prophylaxis. 2. **Chronic bronchitis:**Definition, epidemiology, etiology (risk factors), pathogenesis, classification of clinical forms, clinical picture according to clinical forms, paraclinical investigations, differential diagnosis, evolution, complications, treatment, prophylaxis. 3. **Bronchiectasis:**Definition, epidemiology, etiology, pathogenesis, classification, clinical picture, paraclinical investigations, differential diagnosis, evolution, complications, treatment.

Objectives	Content units
test, sweating test, 6-minute walking test - **To integrate** knowledge about the mechanics of breathing in obstructive lung diseases with compensatory physiopathological processes as well as knowledge about the morphopathological changes that occur with their clinical expression	
Topic (chapter) 4. Chronic obstructive pulmonary disease (COPD)	
- **To define** chronic obstructive pulmonary disease. - **To know** risk factors and express the role of smoking in the development of COPD, the criteria for establishing the diagnosis, the groups of drugs used, the principles of non-drug treatment - **To demonstrate** the ability to identify changes in paraclinical tests and interpret them in a clinical context, to differentiate with nosologies with similar clinical and paraclinical picture, as well as to select the optimal treatment according to severity - **To apply** knowledge related to PEF-metry, spirometry, bronchodilator test, 6-minute walk test - **To integrate** knowledge about the mechanics of breathing in obstructive lung diseases with compensatory physiopathological processes, as well as knowledge about the morphopathological changes that occur with their clinical expression and imaging	**COPD:** Definition. Risk factors. The role of smoking in the development of COPD. Epidemiology. Epidemiological data on the incidence and prevalence and the role of COPD in the overall mortality structure. Classification by GOLD. Clinical picture. Phenotypes: bronchitic type, emphysematous type. Diagnostic. COPD exacerbation, exacerbation criteria. Differential diagnosis. Complications. Treatment: non-pharmacological (the role of smoking cessation, alternatives during withdrawal), pharmacological treatment according to severity, treatment of respiratory insufficiency (oxygen therapy and non-invasive ventilation), surgical treatment and reduction of lung volumes, treatment in exacerbation. Prevention.
Topic (chapter) 5. Syndrome of obstructive sleep apnea (OSA)	
- **To define** obstructive sleep apnea - **To know** the spectrum ofbreathing disorders during sleep - **To demonstrate** the ability to identify clinical signs suggestive of OSA as well as the ability to interpret changes in paraclinical tests and interpret them in a clinical context - **To apply** knowledge related to PEF-metry, spirometry, bronchodilator test, 6-minute walk test, blood gas interpretation, polygraphy results - **To integrate** knowledge related to breathing mechanics in obstructive lung diseases with compensatory pathophysiological processes	The spectrum of breathing disorders during sleep. Classification **Obstructive sleep apnea syndrome**: Definition, epidemiology, pathogenesis, risk factors, etiology, clinical picture (nocturnal and diurnal symptoms), physical examination, predictive models, Evaluation of sleepiness (Epworth scale); investigations (polysomnography tracks). Complications. Treatment
Topic (chapter) 6.Bronchial asthma	
- **To define** asthma and highlight the key elements in the definition - **To know** The factors leading to the onset of asthma as well as the	**Bronchial asthma**: Definition. Epidemiology. Etiology (predisposing factors, causal factors, triggers). The spectrum of allergens in allergic asthma. Determinants of nonallergic asthma. Pathogenesis

Objectives	Content units
pathogenetic mechanisms of extrinsic and intrinsic asthma - **To demonstrate** skills to identify the clinical signs of obstructive syndrome in the patient, skills to interpret the results of laboratory and paraclinical investigations and to select the optimal treatment scheme depending on the severity - **To apply** knowledge related to performing PEF-metry, spirometry, bronchodilator test, asthma test, FeNO, interpretation of allergic skin tests as well as the algorithm of behavior of patients with asthma in emergency situations - **To integrate** knowledge related to breathing mechanics in obstructive lung diseases with compensatory pathophysiological processes	(immunological, nervous, biochemical mechanisms). Pathophysiology of breathing in asthma. The clinical picture. Asthma attack. Asthmatic malaise. Confirmatory paraclinical investigations. Classification (according to WHO, according to severity, according to the level of control - criteria). Asthma in special situations: aspirin asthma, allergic bronchopulmonary aspergillosis, whooping asthma, etc. Differential diagnosis. Complications. Evolution. Treatment (non-pharmacological, pharmacological – drug groups, principles, stepwise treatment (GINA), treatment of asthmatic illness), the value of immunotherapy.
Topic (chapter) 7.Pneumonia	
- **To define** pneumonias and highlight the key elements in the definition - **To know** clinical particuliarities of different morphological types of pneumonia and to correlate with etiological agents, severity criteria and their identification in patients with pneumonia according to severity groups, empirical treatment schemes - **To demonstrate** skills to identify the signs of pulmonary consolidation syndrome in the patient and on radiographs, to interpret the results of laboratory and paraclinical investigations - **To apply** the knowledge related to performing the clinical examination in pulmonary condensation syndrome - **To integrate** the knowledge of the morphopathology of the lung disease in the clinical context, the knowledge of the microbiological particuliarities of microorganisms(enzymatic endowments, virulence, necessary living conditions) and the clinical evolution of pneumonia according to them, the knowledge of the physiopathological mechanisms of lung tissue repair and possible complications of pneumonia, knowledge of the pharmacological mechanisms of antibacterials used in pneumonia and their spectrum of action according to the etiological agents of pneumonia	**Pneumonia:** Definition. Epidemiology. Etiology. Pathogenesis (Encouraging factors, pulmonary defense mechanisms). Classification (according to the etiological principle, according to the site of contracting, according to the morphological criterion, according to extension, according to severity, according to evolution). Clinical picture (signs of infectious impregnation syndrome, pulmonary condensation syndrome). The clinical picture of lobar pneumonia. The clinical features of streptococcal, staphylococcal, Gram-negative pneumonias by atypical germs. Clinical features of viral pneumonias, including COVID-19. Clinical features of pneumonia in the immunocompromised. Clinical features of nosocomial pneumonias The paraclinical methods used to diagnose pneumonia. Differential diagnosis. Complications. Etiological treatment. Empiric treatment of community-acquired and nosocomial pneumonias. Criteria for severity and hospitalization of patients with pneumonia in the general therapy service and in the intensive care unit
Theme (chapter) 8.Pulmonary suppurations. Lung cancer	
- **To define** lung abscess, lung gangrene, necrotizing pneumonia and lung cancer	**Pulmonary suppurations.** The spectrum. Definitions. Epidemiological data. Etiology. Risk factors associated with pulmonary suppurations. The morphological stages of a lung abscess, as well as the morphological

Objectives	Content units
- **To know** the particularities related to the evolution of pneumonia with anaerobic germs, the factors that contribute to the appearance of pulmonary suppurations, the particularities of clinical manifestations depending on the etiological agent - **To demonstrate** skills to identify the signs of the cavity syndrome in the patient with lung abscess, to identify the signs of the cavity syndrome in the chest X-ray and to be able to perform differential diagnosis according to the appearance of the cavity; to identify radiological signs suggestive of lung cancer - **To apply** the knowledge related to performing the clinical examination in the cavitary syndrome as well as those related to the identification of paraneoplastic syndromes - **To integrate** the knowledge related to the morphopathology of the lung disease in the clinical context, the microbiological peculiarities of the microorganisms (enzymatic endowments, virulence, necessary living conditions) and the clinical evolution of the lung abscess, the knowledge of the pharmacological mechanisms of the antibacterials used in lung suppurations and their spectrum of action; knowledge about the morphological peculiarities of lung cancer and its evolution and response to treatment, as well as knowledge about the interaction at the molecular level of the tumor cell with the cells of the immune system in the context of the biological treatment of lung cancer	appearance in pulmonary gangrene. Pathogenesis. Clinical picture of pulmonary abscess (clinical stages) and pulmonary gangrene. Paraclinical examinations. Evolution. Complications. Differential diagnosis in cavity syndrome. Principles of treatment. Pharmacological treatment schemes. Indications for surgical treatment in pulmonary suppurations **Lung cancer.** Definition. Epidemiological data of lung cancer. Risk factors associated with lung cancer. Classification of lung cancer. The clinical picture of lung cancer – warning signs. Patients in the increased risk group. Associated paraneoplastic syndromes. Diagnostic and staging methods in lung cancer. Radiological signs suggestive of lung cancer. The role of endoscopic methods of sampling pathological material. Morphological examination. Immunohistochemistry. Staging according to TNM. Principles of treatment in lung cancer
Topic (chapter) 9.Diffuse interstitial lung disease	
- **To define** diffuse interstitial pneumopathies.Idiopathic pulmonary fibrosis (IPF). sarcoidosis - **To know** classificationdiffuse interstitial pneumopathy, common landmarks in the clinical picture and in the diagnostic algorithm, general principles of treatment - **To demonstrate** skills to identify the signs of interstitial syndrome in the patient with IPF, on the chest X-ray, skills to interpret the results of laboratory and paraclinical investigations, to select the optimal treatment scheme according to the nosological entity - **To apply** knowledge of performing the 6-minute walk test, knowledge of	- **Interstitial lung diseases**. Definition. Classification. Diagnostic principles. - **Idiopathic pulmonary fibrosis (**IPF). Definition. Pathogenesis. Associated risk factors. The clinical picture. Diagnostic. Imaging criteria (signs of typical UIP, probable UIP). Morphological criteria. Complications. Principles of treatment. Antifibrotic medication - **Sarcoidosis.** Definition. Pathogenesis. The clinical picture. Extrapulmonary sarcoidosis. Clinical phenotypes (Lofgren syndrome, Heerford syndrome). Evolutionary types. Diagnostic. Radiological staging. Positive diagnostic criteria. Evolution. Principles of treatment. Immunosuppressive medication.

Objectives	Content units
performing and interpreting spirometry, bodyplethysmography and DLCO - **To integrate** knowledge of the morphological features of idiopathic pulmonary fibrosis and sarcoidosis and their response to treatment	
Topic (chapter) 10.	**Pleurisies**
- **To define** the spectrum of pleural pathologies - **To know** etiological classification of pleurisy, differentiation criteria between transudate and exudate, principles of treatment - **To demonstrate** skills to identify clinical signs of pleural syndrome, skills to identify radiological signs of radiological pleural syndrome - **To apply** knowledge of thoracentesis procedure, knowledge of interpretation of laboratory examination of pleural fluid - **To integrate** knowledge of the anatomy of the chest and the etiopathogenesis of pleurisy	- **Pleural syndrome.** Definitions. Physiology of pleural fluid production and absorption. Classification of pleural syndromes. Etiology of pleurisy. The clinical picture of the pleural syndrome depending on the pleural content. The spectrum of investigations used to identify the etiology of pleurisy. Light's criteria for differentiating transudate from exudate. Treatment of the patient with pleurisy
Topic (chapter) 11.Pulmonary hypertension. Chronic pulmonary cord	
- **To define** Pulmonary hypertension. Chronic pulmonary cord - **To know** the etiological spectrum of pulmonary hypertension and pathogenetic mechanisms - **To demonstrate** skills to identify signs of cardiopulmonary disease in a patient with pulmonary hypertension, skills to identify changes in electrocardiography in a patient with cardiopulmonary disease, skills to identify changes in echocardiography in a patient with pulmonary hypertension, - **Sapply** the knowledge related to performing the clinical examination of the patient with cardiopulmonary disease, the knowledge related to performing the 6-minute walk test - **To integrate** knowledge of the anatomy of the small and large circuits, knowledge of the pharmacological mechanisms of drugs used for the treatment of pulmonary hypertension and the pathogenetic mechanisms of induction of pulmonary hypertension and clinical signs of cardiopulmonary	- **Pulmonary hypertension.** Definition. Epidemiology. Etiological spectrum of pulmonary hypertension and pathogenetic mechanisms. Classification of pulmonary hypertension according to clinical, hemodynamic, functional, morphological criteria, according to severity. The clinical picture. Paraclinical explorations. Treatment (conventional and non-conventional) according to clinical and hemodynamic groups.
Topic (chapter) 11.	**Respiratory failure**
-**To define** respiratory failure -**To know** the pathogenesis of respiratory failure and the	- **Respiratory failure.** Definition. Pathogenetic classification, according to the speed of installation and according to the degree of severity of respiratory insufficiency. Clinical picture of respiratory

Objectives	Content units
compensatory mechanisms of respiratory failure -**To demonstrate** blood gas and degree of compensation interpretation skills -**To apply** knowledge of measuring oxygen saturation and blood gases in arterial blood -**To integrate** knowledge of the pathophysiology of breathing and the pathophysiological mechanisms of gasimetric compensation	failure. Paraclinical explorations to assess the degree of respiratory insufficiency. The importance of the alveolocapillary gradient. Adjusting PaO2 to FiO2. Physiopathogenetic notion of adult respiratory distress. Treatment of respiratory failure depending on the pathogenetic type.
Topic (chapter) 12. Epidemiology, etiology and pathogenesis of tuberculosis.	
• **To define** the notion of "Tuberculosis" • **To know** etiology of tuberculosis, types and structure of M. tubeculosis • **To demonstrate** knowledge of the tuberculosis epidemiological chain • **To apply** epidemiometric indices for the characteristics of the epidemiological situation in tuberculosis in the Republic of Moldova • **To integrate** TB risk factors in patient anamnestic data collection	1.**Epidemiology of tuberculosis.**Tuberculosis endemicity and the epidemiological indicators for its evaluation. The current situation and characteristics of the tuberculosis epidemic worldwide and in the Republic of Moldova. The epidemiological chain. Natural history of tuberculosis in the population.
	2.**Etiology of tuberculosis.**Genus Mycobacterium. Classification. Biochemical structure. Microscopic morphology. Development on culture media. Natural resistance to physical and chemical agents. Primary chemoresistance. Secondary chemoresistance.
	3.**Transmission of tuberculosis infection.**Sources of infection. Ways of infection entering the body and the mechanism of contamination.
	4.**The host organism's response to tuberculosis infection.**Experimental tuberculosis. The Koch phenomenon. The mechanism of the immune response. Tuberculin reaction. Protective immunity. Hypersensitivity – immunity relationship.
	5.**The pathogenesis of tuberculosis.**Stages of tuberculosis pathogenesis. Morphopathology of tuberculosis.
	6.**Evolution of tuberculosis infection.**The role of terrain and environmental factors. The cycle of tuberculosis infection in humans. Infection and disease.
Topic (chapter) 13. Detection and diagnosis of tuberculosis.	
• **To define** the main roadsfor the detection of persons suspected of tuberculosis • **To know** examination methods for establishing the diagnosis of latent tuberculosis infection and active tuberculosis • **To demonstrate** knowledge of the laboratory methods used to detect M. tuberculosis • **To apply** tuberculin test results in children • **To integrate** the results of examination methods for differential diagnosis of tuberculosis with other diseases	1.**Tuberculosis detection.** Passive method – examination of symptoms.Active method: examination of groups with increased risk of disease; examination of at-risk groups. Epidemiological investigation in parentage. Algorithm for diagnosis of tuberculosis.
	2.**Diagnosis of tuberculosis.** Medical history. Clinical evaluation of the suspected patient. Completion and critical evaluation of supplementary exams.The medical record of the inpatient, the rules for completion.
	3.**Microbiological examination.** The importance of microbiological investigations in the diagnosis of tuberculosis. Methods and general principles of harvesting, transporting and storing pathological products. Microscopic examination. Bacteriological examination (culture examination). Cultivation of mycobacteria on liquid media (BACTEC, MB/BacT). Molecular-genetic methods of diagnosis and identification of mycobacterial species in tuberculosis (Polymerization chain reaction, GenoType®MTBDRplus, XpertMTB/RIF, BD ProbeTec™, "fingerprinting", spoligotyping). Interpretation of results. Sensitivity testing methods*M. tuberculosis*.
	4.**Tests for the diagnosis of latent tuberculosis infection.** Tuberculin skin test. Tuberculin. Types of tuberculin. The purpose of using the tuberculin test. Advantages and disadvantages of the tuberculin test. IDR

Objectives	Content units
	Mantoux 2 UT technique. The evolution of the intradermal reaction. The body's reaction to tuberculin. Interpretation of the tuberculin reaction. The tuberculin turn. The booster effect. Interferon Gamma Assays (IGRA tests). Principle. The advantages and disadvantages
	5.**Diagnostic imaging elements in tuberculosis.** The value and place of the radiological examination in the diagnosis of pulmonary tuberculosis. Techniques and methods. Possibilities and limits. Normal radiological anatomy of the lung and hilar region. Radiological semiology of tuberculosis of the respiratory system. (Elementary radiological changes in pulmonary tuberculosis). Interpretation of pathological opacities in pulmonary tuberculosis. Computed tomography (CT). Nuclear magnetic resonance (NMR). Ultrasound.
	6.**Respiratory functional explorations.** Pathophysiology of pulmonary respiration in tuberculosis. Spirography. Plethysmography. Gasometry. Perfusion scintigraphy. Interpretation of functional examination results.
	7.**Laboratory investigations.** Biochemical and immunological investigation. Examination of liver function. Examination of renal function. Cytological examination of the pleural effusion. Biochemical examination of the arachnoid fluid. Interpretation of results.
	8.**Bronchoscopy in the diagnosis of tuberculosis.** Indications for bronchoscopy. Bronchoscopy technique. Pathological endoscopic semiology. Endoscopic aspects in specific bronchopulmonary pathology. Methods of bronchoscopic collection. Broncho-alveolar lavage (BAL).
	9.**Biopsy in the diagnosis of tuberculosis.** Indications for biopsy. Biopsy methods. The histological appearance in tuberculosis. Histological appearance in bronchopulmonary cancer. The histological aspect of non-specific inflammation.
Topic (chapter) 14. Tuberculosis treatment.	
• **To define** goals and principles of antituberculosis treatment • **To know** classification of antituberculosis preparations • **To demonstrate** the ability to train individual treatment in patients with mono- and polyresistance • **To apply** treatment regimens and regimens in susceptible and resistant tuberculosis • **To integrate** medicinal and pathogenetic treatment of tuberculosis patients	1.**Antituberculosis drugs.** Classification of antituberculosis preparations. Pharmacological antituberculosis activity of first-line and 2nd-line preparations. Adverse reactions to antituberculosis preparations. Classification. Action mode. Interaction with other drugs. New antituberculosis drugs.
	2.**Medication.** Treatment goals. General principles of treatment. Therapeutic regimes. Treatment of classic TB within the DOTS strategy: basic principles, schemes, regimens. Categories of patients subject to chemotherapy according to DOTS.
	3.**Treatment monitoring** and evaluation of TB treatment outcomes.
	4.**Treatment of resistant tuberculosis.** Treatment of multidrug-resistant tuberculosis (MDR TB): Standardized and individual regimen. Treatment of cases of mono- and polyresistant tuberculosis. Patient behavior with XDR TB.
	5.**TB patient communication, information and education.** Importance of health education in tuberculosis control. The importance of patient adherence to treatment.
	6.**Adjuvant medication.**
Topic (chapter) 15. Latent tuberculous primary infection. Peculiarities of primary tuberculosis. The primary tuberculous complex. Tuberculosis of the intrathoracic lymph nodes. Complications of primary tuberculosis.	

Objectives	Content units
• **To define** primary tuberculosis • **To know** clinical forms of primary tuberculosis • **To demonstrate**the ability to recognize the peculiarities of primary tuberculosis • **To apply** diagnostic criteria of primary tuberculosis • **To integrate** knowledge in the conduct of the case - the child with tuberculosis	1.**Clinical classification of tuberculosis.**Basic principles of classification. Compartments. Pulmonary clinical forms. Extrapulmonary tuberculosis. Characteristic of the tuberculous process. Phases of the tuberculous process. Complications of tuberculosis. Posttuberculosis sequelae. The elements of formulating the diagnosis based on the classification.
	2.**Primary tuberculosis.**Primary tuberculous complex. General features of primary tuberculosis. Pathogenesis. Latent tuberculosis primary infection. Morphopathology of the primary complex. Positive and differential diagnosis. Treatment and prognosis.
	3.**Tuberculosis of the intrathoracic lymph nodes.**Pathogenesis. Morphopathology. Clinical forms. Symptomatology and evolution. Complications. Positive and differential diagnosis. Treatment. Sequelae of primary tuberculosis infection. Epidemiological significance of posttuberculosis sequelae.
Theme (chapter) 16. Secondary pulmonary tuberculosis (disseminated, nodular, infiltrative, fibro-cavitary). Clinical features, differential diagnosis.	
• **To define** forms of secondary pulmonary tuberculosis and complications • **To know** clinical, imaging and laboratory examination features of secondary pulmonary tuberculosis forms • **To demonstrate** the ability to perform the differential diagnosis with other lung diseases • **To apply** clinical and paraclinical diagnostic methods for confirming the diagnosis of secondary forms of tuberculosis and the corresponding treatment schemes • **To integrate** the strengths of TB detection methods for the earliest possible diagnosis (without complications) of secondary forms of tuberculosis	1.**Disseminated pulmonary tuberculosis.**Pathogenesis. Clinical forms. Pathological anatomy. Miliary tuberculosis. Subacute and chronic disseminated pulmonary tuberculosis. Symptomatology and evolution. Radiological signs. Positive and differential diagnosis. Treatment.
	2.**Nodular pulmonary tuberculosis.**Pathogenesis. Symptomatology, evolution and prognosis. Appreciation of the specific activity of nodular pulmonary tuberculosis. Positive and differential diagnosis. Treatment.
	3.**Infiltrative pulmonary tuberculosis.**Pathogenesis. Clinical-radiological types of tuberculous infiltrates. The particularities of evolution. Symptomatology and prognosis. Positive and differential diagnosis. Treatment. Caseous pneumonia.
	4.**Fibro-cavitary pulmonary tuberculosis.**Pathogenesis. The favoring factors. Clinical and radiological characteristics. Evolution and prognosis. Complications. Differential diagnosis. Treatment.
	5.**Tuberculous pleurisy.**Pathogenesis. Classification. Clinical and radiological symptomatology. Indications and method of thoracocentesis. Examination of the pleural fluid. Differential diagnosis. Evolution and treatment. Tuberculous empyema.
	6.**Tuberculosis of the bronchi.**Pathogenesis. Clinical forms and localization. Correlation with the locations of pulmonary tuberculosis. Bronchial tuberculosis clinic. Laryngeal Tuberculosis Clinic. Differential diagnosis. Evolution, treatment.
	7.**Pulmonary hemorrhage.**Pathogenesis. Classification. Symptomatology. Positive and differential diagnosis. Therapeutic medical treatment. Indications for surgical interventions.
	8.**Spontaneous pneumothorax.**Pathogenesis. The clinical and radiological picture. Evolution. Positive and differential diagnosis. Complications. Therapeutic treatment. Surgical treatment.
	9.**Tuberculosis and HIV infection.**Epidemiology. Correlation between AIDS and tuberculosis. Clinical and radiological peculiarities of tuberculosis in patients with HIV/AIDS infection. Detection and diagnosis of tuberculosis in patients with HIV/AIDS. Detection and diagnosis of HIV/AIDS in patients with tuberculosis. The particularities of antituberculosis treatment in patients with AIDS and tuberculosis.

Objectives	Content units
Topic (chapter) 17.Prophylaxis of tuberculosis. TB infection control. Organization of tuberculosis control in the Republic of Moldova.The patient-centered model of medical care for tuberculosis patients.	
• **To define** directions of tuberculosis prophylaxis • **To know** specific prophylaxis measures, principles, indications, contraindications and complications, their causes • **To know** the non-specific prophylaxis measures, the epidemiological danger criteria of the TB infection outbreak and the tuberculosis infection control measures • **To apply** measures to prevent TB infection, treatment in TB control and the patient-centered model of medical care for tuberculosis patients • **To integrate** non-specific and specific prophylaxis measures in the control of TB infection	1.**BCG vaccination.**Immunogenesis and vaccine protection. Definition of BCG vaccine. Indications and contraindications for vaccination. BCG vaccination technique. The evolution of the post-vaccination reaction. BCG post-vaccination complications, their classification. Causes of development and methods of their prevention. New, experimental vaccines. 2.**Drug prophylaxis of tuberculosis.**Primary prophylaxis (chemoprophylaxis). Secondary prophylaxis (preventive chemotherapy). The directions. Methods. 3.**Tuberculosis outbreaks.** The criteria for the formation of foci. Classification of outbreaks. Activities in tuberculosis foci. Sanitation of outbreaks. Epidemiological investigation. Cooperation of the phthisiopneumology and preventive medicine service. 4.**Infection control in tuberculosis.**Managerial activities. Administrative control. Environmental control measures. Personal respiratory protection. 5.**National Tuberculosis Control Program.**Purpose and objectives. 6.**Organizational structure and responsibilities of tuberculosis control services.**The central level. District/municipal level. Primary level. Tuberculosis control in primary care. The joint activities of Public Health centers, phthisiopneumology services and primary medicine in the control of tuberculosis. 7.**The patient-centered model of medical care for tuberculosis patients**is defined as a complex set of cheap, accessible and acceptable medical services provided in a favorable environment for the prevention, diagnosis and treatment of tuberculosis and is aimed at increasing the effectiveness of treatment by ensuring patient support throughout the course of treatment.
Topic (chapter) 18.Elements of immunology. Urticaria and angioedema	
- **To define** the notion of allergy, urticaria and angioedema. - **To know** the basic elements of immunology: antigens, antibodies, components of the immune system. The cellular and humoral immune response. Hypersensitivity reactions. The spectrum of investigations used in allergology - **To demonstrate** the methods of performing diagnostic tests in allergology, the ability to react in the event of a medical emergency in the case of a patient with urticaria, angioedema and anaphylaxis - **To apply** knowledge of anatomy, principles of resuscitation in medical emergencies in order to provide emergency medical aid in angioedema.	1.**Hypersensitivity reactions**. Stages of hypersensitivity reactions. Serological and cellular markers of hypersensitivity reactions. Diagnostic tests. Impact on the selection of treatment methods 2.**Acute and chronic urticaria**. Angioedema. Classification of urticaria and angioedema. The clinical picture in urticaria and angioedema. Emergencies in angioedema. Special types of angioedema: Hereditary angioedema, induced by ACE inhibitors. Clinical and preclinical diagnosis. Differential diagnosis with other rashes. Treatment in urticaria and angioedema. Treatment in special types of angioedema.

Objectives	Content units
- **To integrate** physiopathogenetic mechanisms with morphological manifestations and clinical appearance as well as to deduce applicable investigation methods and therapeutic targets	
Topic (chapter) 19.Allergy to medicines	
- **To define** the notion of drug allergy - **To know** spectrum and mechanisms ofadverse drug reactions - **To demonstrate** the ability to identify the clinical forms of drug allergy, to draw up a differential diagnosis list with nosologies with similar clinical and paraclinical picture, to select the optimal treatment according to the identified clinical syndrome - **To apply** principles of skin testing used in the diagnosis of drug allergies - **To integrate**t he knowledge related to the morphopathological changes that occur with their clinical expression	**Drug allergy.** Incidence. Etiology, risk factors. Pathogenesis. Classification of clinical manifestations. Clinical features of skin manifestations. Stages of clinical and laboratory diagnosis. Groups of drugs used and principles of treatment.
Topic (chapter) 20.Food allergy. Anaphylaxis	
- **To define** food allergy. - **To know** intestinal barrier theory and the development of oral tolerance. Principles of cross-reactions. - **To demonstrate** abilities to identify the clinical signs of the obstructive syndrome in the patient, to interpret the results of laboratory and paraclinical investigations, to select the optimal treatment scheme depending on the severity - **To apply** the knowledge related to the performance and interpretation of allergy skin tests, the behavior algorithm of patients with food allergy in emergency situations. Epinephrine autoinjector application - **To integrate** the knowledge related to the physiopathology of intestinal absorption with the mechanisms of immunological tolerance the knowledge related to the particularities of the digestive tract in children and the	**Food allergy.** Definition. Epidemiological data of food allergy. Risk factors associated with food allergy. Pathogenetic mechanisms of food allergy. Sensitization pathways in food allergy. Oral allergy syndrome. The clinical picture of food allergy. The clinical picture of anaphylaxis. Severity of anaphylaxis. Stages of food allergy diagnosis. Molecular determinants in food allergies. Investigations used to evaluate a patient with food allergy. Principles of food allergy treatment. Principles of treatment in anaphylaxis.

Objectives	Content units
mechanisms of intestinal absorption	
Topic (chapter) 21. Allergic rhinitis	
- **To define** allergic rhinitis. - **To know** hygiene theory, stages of type 1 hypersensitivity reaction - **To demonstrate** skills to identify the signs of allergic rhinitis in a patient with rhinitis, to interpret the results of laboratory and paraclinical investigations, to know the treatment of allergic rhinitis, to select the optimal treatment scheme according to severity - **To apply** the knowledge related to the clinical examination of the patient with allergic rhinitis, the behavior algorithm of patients with allergic rhinitis according to the type of allergic rhinitis (seasonal or perennial) - **To integrate** knowledge about the physiopathology of the type I hypersensitivity reaction and the morphological changes that can occur in the nasal mucosa, knowledge about the anatomical peculiarities of the nasopharynx in children and their predisposition to various associated chronic conditions (nasal polyposis, otitis media, etc.), knowledge about the mechanisms pharmacological properties of the drugs used in the treatment of allergic rhinitis with the effectiveness of their use in different stages of the disease.	**Allergic rhinitis**. Epidemiological data, risk factors and classification of allergic rhinitis. The clinical picture of allergic rhinitis. Paraclinical methods used for allergic rhinitis. The importance of allergy tests in allergen identification. Treatment of allergic rhinitis according to severity. Desensitization
Topic 22. Emergency management in pulmonology.	
• **To demonstrate** skills to identify clinical signs suggestive of emergency in pulmonology • **To identify** state of emergency • **To know** signs of respiratory failure, tests needed to identify the type of gas disturbance, signs of hyperinflation or pneumothorax on chest x-ray • **To apply** theoretical knowledge related to the management of a case of respiratory failure, anaphylaxis, pulmonary hemorrhage	• Hypercapnic respiratory failure in a patient with COPD. • Tension pneumothorax in a COPD patient with bullous emphysema. • Moderate hemoptysis in a patient with bronchiectatic sequelae after MDR-TB. • Anaphylactic shock to ceftriaxone in a patient with pneumonia.

Objectives	Content units
• **To integrate** knowledge about the physiopathology of breathing, clinical aspects, identification and treatment methods	

VIII. PROFESSIONAL (SPECIFIC (CS)) AND TRANSVERSAL (TC) COMPETENCES AND STUDY OUTCOMES

✓ Professional (specific) (SC) competences:

CP1. The responsible execution of professional tasks with the application of the values and norms of professional ethics, as well as the provisions of the legislation in force.
CP2. Adequate knowledge of the sciences about the structure of the body, the physiological functions and the behavior of the human body in various physiological and pathological states, as well as the existing relationships between the state of health, the physical and the social environment.
CP3. Resolving clinical situations by developing the plan of diagnosis, treatment and rehabilitation in variouspathological situations and the selection of appropriate therapeutic procedures for them, including the provision of emergency medical assistance.
CP4. Promoting a healthy lifestyle, applying preventive measures and self-care.
CP5. Interdisciplinary integration of the doctor's work in the team with the efficient use of all resources.
CP6. Conducting scientific research in the field of health and other branches of science.

✓ Transversal competences (TC):

CT1. Autonomy and responsibility in activity.

Upon completion of the course, the student will be able to:

- To demonstrate theoretical and practical skills specific to Pneumology, pneumophthisiology and allergology
- To examine and formulate a presumptive diagnosis in a patient with pulmonary or allergy symptoms
- To perform and interpret the results of specific clinical tests
- To be able to present the principles of conduct in various entities of pulmonary and allergological pathology

IX. THE STUDENT'S INDIVIDUAL WORK

No.	Expected product	Implementation strategies	Evaluation criteria	Implementation terms
1.	Working with information sources	Reading the lecture or the material from the textbook on the topic, carefully. Reading the questions in the assignment, which require reflection on the topic. Be familiar with the list of additional informational sources on the respective	The ability to extract the essentials; interpretive skills; the volume of work	During the course of the module

		topic. To select the source of additional information on that topic. Reading the entire text carefully and writing the essential content. Formulation of generalizations and conclusions regarding the importance of the theme/subject.		
2.	Working with online sources	Actively studying the literature related to the disease. Ability to compile a concise but accurate summary of etiology, pathogenesis, and treatment methods. To generalize his observations on the patient in the form of an epicrisis. Strengthening skills in comprehensive patient research. Systematic and logical presentation of all data obtained.	The ability to extract the essentials; interpretive skills; the ability to formulate conclusions; the volume of work	During the course of the module
3.	Clinical case report	Summary of the patient's observation (civil data, reasons for admission, history, antecedents, summary epidemiological anamnesis, positive elements of the objective examination, laboratory data and analyzes and synthetic recapitulation of the patient's observation) Supporting the positive diagnosis Analysis of the particularities of the case Differential diagnosis Evolution and prognosis Treatment Subsequent curative-prophylactic indications, assessments of work capacity.	Solving situational problems; the ability to extract the essentials; interpretive skills; the ability to formulate conclusions; the volume of work	During the course of the module
4.	The activity of examining patients during practical work and guards	Clinical examination of the patient, identification of the immediate clinical syndrome in the patient, in the laboratory and instrumental examination, acquisition of the diagnostic algorithm, differential diagnosis and individual treatment	The correct formulation and argumentation of the diagnosis, investigation and treatment plan of the specific patient	During the course of the module
5.	Preparation and support of presentations on various topics in pulmonology, allergology	Selection of the theme of the presentations and the terms of the realization	Workload The degree of penetration into the essence of the subject The level of scientific argumentation The quality of the conclusions Elements of creativity Formation of personal attitude Graphic presentation Mode of presentation	During the course of the module

X. METHODOLOGICAL SUGGESTIONS FOR TEACHING-LEARNING-ASSESSMENT

- ***Teaching and learning methods used***

The discipline of pneumology is taught in the classic way: courses, seminars and practical work. The latest theoretical support will be read in the classes.

The courses are held in the lecture hall of the discipline with the entire series as an interactive lecture by rotation of the teaching staff of the course according to the timetable of the discipline in the form of systematically structured PowerPoint presentations accompanied by a rich and suggestive iconography (images, tables and algorithmic schemes) . The informative material is continuously adapted to the latest information in the field of respiratory diseases in particular and medicine in general. All the recommended bibliographic titles are available to be consulted at the headquarters of the discipline. Attendance at the course is mandatory, with a maximum of one unmotivated absence from the course being accepted.

Self-training work consist of:

- Sessions of clinical examination and interpretation of bulletins, respiratory functional explorations, bulletins, lung x-rays, computer tomography, performed by each student at the bedside of patients admitted to the clinic. In these internships, the students in a group together with an internship teacher are divided into rooms in the ratio of 2-3 students to one patient.
- Presentations of clinical cases (pneumonia, bronchial asthma, COPD, broncho-pulmonary cancer, pleurisy, pulmonary tuberculosis, pulmonary fibrosis) made by the teaching staff responsible for the internship with 3-4 groups together with the training of students in analytical discussions on their side. These internships take place in the micro-course rooms of the discipline, which are equipped with a negatoscope for reading radiographs and special equipment for the projection of tomography, according to a schedule displayed on the notice board of the discipline.
- Practical workshops for working with the spirometer and other simple tools for evaluating and monitoring lung patients, anti-smoking counseling and developing pulmonary rehabilitation programs. Each group of students together with a teaching staff holding an internship by rotation will be assigned to carry out these internships at CUSIM.
- Practical demonstrations of the 6-minute walk test, cardiopulmonary stress test, bronchoscopy, thoracocentesis, polysomnographic recording done with each group of students separately.
- Attendance at internships/practical work is mandatory, all absences must be made up.

- ***Applied didactic strategies/technologies***

"Group interview", "problem-based learning", "round table", practical work at the patient's bedside

- ***Evaluation methods***

Current: frontal and/or individual control by:

- examination
- Analysis of clinical case studies
- Solving clinical problems/cases
- Knowledge assessment papers

In the Pneumology and Allergology discipline, the students' knowledge will be evaluated daily, and at the end of the sections they will be evaluated with a grade in the totals.

The final*: exam, which consists of:*

- choice test
- theoretical evaluation based on the interview-type discussion on the extracted topics
- practical evaluation based on solving a clinical case.

The method of rounding grades at the evaluation stages

Intermediate grades grid (yearly average, grades from exam stages)	National Grading System	Equivalent ECTS
1.00-3.00	**2**	**F**
3.01-4.99	**4**	**FX**
5.00	**5**	**E**
5.01-5.50	**5.5**	
5.51-6.0	**6**	
6.01-6.50	**6.5**	**D**
6.51-7.00	**7**	
7.01-7.50	**7.5**	**C**
7.51-8.00	**8**	
8.01-8.50	**8.5**	**B**
8.51-8.00	**9**	
9.01-9.50	**9.5**	**A**
9.51-10.0	**10**	

The annual average mark will be composed of the arithmetic mean of the marks obtained in the current evaluations within the totalizations (compartments).

The final exam consists of 3 stages: computer-assisted testing, oral theoretical answer, practical skills (clinical case)). The grades for the last 2 stages will be expressed in numbers according to the grading scale (see table). The final grade will be obtained after applying the following formula:

Final grade = (Annual average x 0.3) + (Practical skills x 0.2) + (Grid test x 0.2) + (Oral exam x 0.3)

The final grade obtained will be expressed as a number with two decimal places, which will be entered in the grade book.

Failure to appear at the exam without valid reasons is recorded as "absent" and equates to a grade of 0 (zero). The student has the right to 2 repeated submissions of the failed exam.

XI. RECOMMENDED BIBLIOGRAPHY:

A. Mandatory:

1. Botnaru V. Pneumology. Balacron Typography. Chisinau 2019
2. Botnaru V. Internal medicine. Pneumology Module Brief. Central Typography. Chisinau 2009
3. Botnaru V. Functional respiratory assessment. Central Typography. Chisinau 2007
4. Botnaru V. Pneumology in tables and clinical cases. Balacron Typography. Chisinau 2020

B. Additional

1. Botnaru V and colleagues. Thoracic imaging in clinical cases commented. Balacron Typography. Chisinau 2012
2. National clinical protocols (latest editions)
3. Botnaru V, Munteanu O. Idiopathic interstitial pneumonitis. Central Typography. Chisinau 2007
4. Botnaru V, Rusu D. Pneumonia. Central Typography. Chisinau 2010
5. Corlăteanu A., Botnaru V., Rusu D. News in obstructive pulmonary diseases. Methodical guidance. Polygraphic publishing center Medicine. Chisinau 2013
6. Botnaru V, Calaras D. Sarcoidosis. PrintCaro printing house, Chisinau 2020
7. Botnaru V, Calaras D. Hypersensitivity pneumonitis. PrintCaro printing house, Chisinau 2020
8. Botnaru V. Radiological semiology of the chest. Central Typography. Chisinau 2005
9. ERS Handbook in respiratory medicine. Ed. Paolo Palange, Anita Simonds, second edition, 2013

Annex to the curriculum

No	Composition	Time	Venue
	Simulator		
1	Familiarization with the simulation room/debriefing room • The presence of video recording cameras • O2 sources, • Monitors in service • The phone for requesting emergencies, Rg, gasometry, etc. • crash cart • Automatic syringes, infusers • The principles of shaping the patient's position in bed, handling the functional bed	**08:00 – 08:05** 5 minutes The whole group	Debriefing room
2	Familiarization with the Simulator • Simulator capabilities (blinking, breathing) • Ps, Ta testing, ECG electrode placement • Peripheral venous access lines • The points of insertion of the drains for solving pneumothorax and hydrothorax • Auscultation (chest, heart) • Peripheral cyanosis	**08:05 – 08:10** 5 minutes The whole group	Simulator room
3	Participation in the simulation • distribution of roles • Teamwork • communication • subordination • delegation of function	**08:10 – 08:15** 5 minutes The whole group	Debriefing room
4	Simulation scenario/debriefing room	**08:15 – 08:25** 10 minutes 6 students	Simulator room
5	Simulation scenario/debriefing room	**08:25 – 08:35** 10 minutes 6 students	Simulator room
6	ECS debriefing	**08:35-09:05** 20 minutes (whole group)	Debriefing room

	PAUSE	**10 minutes**	
	Spirometry		
1	Familiarization with the spirometer - Spirometer components: pneumotach/mouthpiece, nose pliers - Familiarization with the software interface - Entering passport data - Entering constitutional data	**09:15 – 09:20** 5 minutes	
2	Familiarization with the particularities of performing the test - Position of the patient during the maneuver - FVC curve - Volume flow curve - Acceptability of the test - Test repeatability (reproducibility)	**09:20 – 09:25** 5 minutes	
3	Participation in the simulation - taking the test by students	**09:25 – 09:40** 15 minutes	
	Ultrasonography		
1	Familiarization with the ultrasonographer: - the type of probes - the importance of the gel - handling the panel	**09:40 – 09:45** 5 minutes	
2	Familiarization with the type of USG wave Finding the landmarks of the lung Visceral pleura Dragging of the pleura	**09:45 – 09:50** 5 minutes	
3	Performing USG on a volunteer	**09:50 – 10:05** 10-15 minutes	
4	Performing USG in pathological situations on the simulator	**10:05 – 10:20** 10-15 minutes	