**MINISTRY OF EDUCATION AND SCIENCEKYRGYZ REPUBLIC OSH STATE UNIVERSITY INTERNATIONAL MEDICAL FACULTY DEPARTMENT OF PUBLIC HEALTH**

**“Approved” - “Agreed” -**

**Head of department of Public Health Chairman c.m.s. Keneshbaev B.K . c.m.s. Turusbekova A.K.\_\_\_\_\_\_\_\_\_\_\_**

**STUDENTS TRAINING PROGRAM**

**SYLLABUS**

**Discipline: "Clinical Immunology"**

**Course :560001 General Medicine**

**Credits - 2 Course - 3 Semester- VI Lectures –18 hours**

**Practical – 27 hours**

**ISW - 45hours**

**Midterm control-2**

**Examination- VI semester**

**Total work - 90 hours**

**Compiled by teachers:**

1. Mainazarova E.S- candidate of Medical Sciense/ lecturer.

2. Abdumalic k N- teacher, OshSU, IMF

**Osh-2024.**

**1. PURPOSE OF THE DISCIPLINE**

**The purpose of the discipline is: to acquire knowledge of the general laws of the development, structure and functioning of the immune system in normal patients and in immunopathology, as well as the diagnosis of immuno-mediated diseases.**

In the process of mastering the discipline, the student will achieve the following learning outcomes (LO) and will have the appropriate competencies:

|  |  |  |
| --- | --- | --- |
| **LO BEP code and its formulation** | **The competence of the LO** | **Code of LO discipline and its formulation** |
| ***LО 5*** | PC-5-capable and ready to conduct and interpret the survey, physical examination, clinical examination, the results of modern laboratory and instrumental studies, write a medical record of outpatient and inpatient child and adult. | Knows and understands: conduct a survey, visual examination, clinical and laboratory examination.  Able to: interpret the results of modern laboratory and instrumental studies  Owns skills of propaedeutics of internal diseases. |
| ***LO 7*** | PC-15-is able to analyze the patterns of functioning of individual organs and systems, use knowledge of anatomical and physiological features, the main methods of clinical and laboratory examination and assessment of the functional state of the body of an adult and children, for timely diagnosis of diseases and pathological processes;. | Knows:  Pathological changes of the body during diseases.  Is able to: to carry out biochemical and clinical studies.  Objective: to evaluate the results of biochemical and clinical studies. |

**During the development of the discipline students will**

**Know and understand:**

\* Know the anatomical and physiological features of the organ systems of an adult patient;

\* pathophysiological processes in the body.

\* basic terms used in immunology and allergology;

\* structural and functional features of the human immune system;

\* have a complete and coherent understanding of immunology as a subject in general, to form an idea of the immune system as one of the most important systems in the body;

\* development and functional properties of the main cellular elements of the immune system (T-and B-lymphocytes, NK cells, dendritic cells, macrophages, neutrophils, mast cells and other cells), their role in the reactions of innate and adaptive immunity;

\* the main humoral factors of the immune system (antibodies, complement system, cytokines, chemokines, etc.), their role in the reactions of innate and adaptive immunity;

\* fundamentals of immunogenetics and genetic control of the immune response;

\* have an understanding of the role of the immune system in maintaining the genetic constancy of the internal environment, the mechanisms of immunological recognition and regulation of individual parts of the immunological response at the molecular and cellular level;

**Be able to:**

\* suspect immune disorders in the patient;

\* justify the need for clinical and immunological examination of the patient;

\* correctly interpret the results of the patient's immunological examination;

\* use the acquired knowledge of immunology in the study of other biomedical and medical disciplines.

**Own:**

\* ability to assess the immune status on level 1 tests for the most common diseases;

\* skills to justify the need for an immunological examination, taking into account the results of a clinical and laboratory examination;

\* the principles of medical deontology and medical ethics.

**3. COURSE PREREQUISITES**

molecular biology and medical genetics, biochemistry, anatomy, physiology, histology, pathological physiology, microbiology, pharmacology.

**4. COURSE POST-REQUISITES**

internal diseases, surgical diseases, children's diseases, infectious diseases, oncology.

**5. Technological map of the discipline “Clinical immunology”**

|  |  |  |  |
| --- | --- | --- | --- |
| **Practical class**  **30p.** | **Lecture**  **30p.** | **SW**  **30p.** | **Module**  **30p.** |
| **-explanation-10**  **test-10**  **conspect-5**  **video-5** | **-attendance.-5**  **-discussion-5**  **-test-20** | **-Handmake-10**  **-PPT-5**  **-table-5**  **-crossword-5**  **-tasks-5** | **MCQ-30** |

**6. SUBJECT SCORING CARD**

|  |  |  |
| --- | --- | --- |
| **Form of control** | **ТК1** | **Total** |
| **Attendance** | **5** | **5** |
| **Notebooks** | **5** | **5** |
| **Oral survey** | **10** | **10** |
| **Solving a situational problem (Interpretation of analysis)** | **5** | **5** |
| **Test control** | **5** | **5** |
| **Total** |  | **30** |

**SUBJECT SCORING CARD ON CK**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **ТК1** | **Attendance** | **notebooks** | **Oral survey** | **Situati-onal**  **Task** | **Interpreta-tion of analysis** | **Test control** | **Total** |
| **Topic1** | **5** | **5** | **10** | **5** | **5** | **5** | **30** |
| **Topic 2** | **5** | **5** | **10** | **5** | **5** | **5** | **30** |
| **Topic 3** | **5** | **5** | **10** | **5** | **5** | **5** | **30** |
| **Topic 4** | **5** | **5** | **10** | **5** | **5** | **5** | **30** |
| **Topic 5** | **5** | **5** | **10** | **5** | **5** | **5** | **30** |
|  | **20** | **25** | **50** | **25** | **25** | **25** | **(NT/5)=30** |

# 7. SUMMARY OF DISCIPLINE

The structure of the immune system

The immune system. Structural and functional organization. The structure of the immune system (central and peripheral organs of the immune system). Cellular and humoral factors of immune responses. Immunological phenomena. Mechanisms of induction and regulation of immunological reactions.

Antigens, allergens, and antibodies. Antigens: definition, properties of antigens. Allergens: definition, classification. Antibodies: definition, varieties. The structure of immunoglobulins.

Methods for evaluating the immune system

Immunodiagnostics of diseases of the immune system. Immunological tests of the I-th and II-th level. Immunodiagnostics of phagocytosis disorders. Assessment of leukocyte chemotaxis. Assessment of the adhesive properties of phagocytes. Determination of the phagocytic index and number. Determination of the formation of reactive oxygen species: HST test, flow cytometry and chemiluminescence.

Immunodiagnostics of immunoglobulin synthesis disorders. Methods of quantitative determination of immunoglobulins: immunodiffusion in gel, immunoelectrophoretic methods, photometric methods, enzyme immunoassay( ELISA), radioimmune analysis.

The content of immunoglobulins S-IgA, A, G, M in saliva, gingival fluid, gingival pocket fluid. Study of the cellular composition of oral fluid. Assessment of oral immunity.

Immunodiagnostics of cellular immunity disorders. Determination of proliferative activity of lymphocytes under the action of polyclonal activators. Evaluation of the proliferative response of lymphocytes to stimulation via TCR. Assessment of lymphocyte differentiation and functioning

subpopulations. Determination of natural regulatory T cells. Assessment of the cytotoxic activity of natural killers. Methods for assessing cell death in immunological studies.

Methods for evaluating the cytokine system: molecular biological methods, methods for quantifying cytokines using immune analysis, testing of the biological activity of cytokines, intracellular cytokine staining, ELISPOT method and immunofluorescence.

Allergological methods of examination. Elimination tests. Skin allergy testing. Methods of scarification and prick testing. Allergometric titration. Intradermal tests. Application tests. Provocative testing: conjunctival test, nasal test, inhalation test, test-inhibition of natural white blood cell emigration in vivo (according to A. D. Ado), sublingual and oral tests, provocative tests with acetylsalicylic acid, oral test with food allergen, double-blind placebo-controlled provocative test with food allergen. Provocative tests in patients with urticaria, skin test. Laboratory methods of allergy research. Determination of the total IgE level in the blood serum by the ELISA method. Determination of the level of allergen-specific IgE in the blood serum by ELISA, radioallergosorbent test (RAST), radioimmune analysis (RIA), multiple allergosorbent test. New diagnostic methods for atopic and systemic diseases - Phadiatop, ImmunoCAP.

Mechanisms of development of immune pathology and its main manifestations.

Innate immunity. Definition of innate immunity and its characteristic features. Receptors of innate immune cells. Humoral factors of innate immunity and the mechanism of their action. The cellular link of innate immunity. Phagocytes and phagocytosis. Natural killers and their targets.

The main histocompatibility complex. The structure of the main histocompatibility complex. Immune reactivity and the main histocompatibility complex. Gene-dependent diseases. Immune reactivity and blood type.

Adaptive immunity. Characteristics of T-lymphocytes. The structure of the receptor. Antigen-independent differentiation. Formation of TCR variability. Stages of differentiation. Positive and negative selection. The main subpopulations of T-lymphocytes and their functions. Characteristics of B-lymphocytes: subpopulations, structure of the B-cell receptor, markers of B-lymphocytes. Antigen-independent differentiation of B-lymphocytes. Formation of the B-cell receptor. Stages of differentiation. Selection. Antigen-dependent differentiation of B-lymphocytes.

The cytokine system. The main properties of cytokines, cytokine-producing cells. Cytokines and their antagonists. Target cells. Cytokines and inflammation.

The immune response is the first line of immune defense. Adaptive immunity is the second line of defense. Phases of the adaptive immune response. Types of immune response: cellular immune response (cellular cytotoxicity, inflammatory immune response) and humoral response. Factors affecting the implementation of the type of immune response. Classification of allergic reactions (types).

Characteristics of primary and secondary immunodeficiency

Primary immunodeficiency: immunopathogenesis, clinical manifestations, diagnosis. Classification of primary immunodeficiency. The main clinical syndromes of the manifestation of immunodeficiency: malignant neoplasms; allergic diseases; autoimmune diseases; other diseases.

Deficiency of humoral immunity. Selective deficiency of IgA and its subclasses. Deficiency of cellular immunity. Phagocytic immunity deficiency. Lack of components of the compliment system.

Acquired immunodeficiency: forms of secondary immunodeficiency, immunopathogenesis, clinical manifestations, diagnosis.

Acquired immunodeficiency syndrome (AIDS).

Allergic pathology

Allergic diseases: definition, classification, epidemiology, etiology, pathogenesis, clinical picture, diagnosis.

Allergic rhinitis. Allergic conjunctivitis. Bronchial asthma. Atopic dermatitis. Contact dermatitis. Urticaria. Anaphylactic shock.

Drug, food and insect allergies. Sensitization of the body of medical personnel of dental institutions.

Intolerance of dental materials from acrylates: etiology, pathogenesis, diagnosis. Intolerance to products made of latex, gypsum. Intolerance to metal dentures: etiology, pathogenesis, diagnosis, prevention and treatment principles. Amalgams, their characteristics, their effect on oral tissues and the body.

Non-allergic forms of intolerance to materials and preparations used in dentistry.

Fundamentals of immunotherapy. Immunomodulators. Definition. Classification of immunomodulators by origin. Preparations of exogenous origin: bacterial, vegetable. Drugs of endogenous origin: immunoregulatory peptides based on thymus extracts, immunoregulatory peptides based on bone marrow, cytokines (natural, recombinant). Chemically pure and synthesized immunomodulators.

Immunoglobulins for intravenous administration.

**8. Calendar and thematic plan of discipline by type of classes**

**13. 1. Lectures**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № no. and name of  Topics | Сем  № | Studied questions and tasks | Number of  hour. | Points | Literature | Use of educational technologies |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Module 1** | | |  |  |  |  |
| **Topic1**  **1. The concept of "immunity", central and peripheral organs of the immune system** | 1 | *Plan*    *\* pathophysiological processes in the body.*  *\* basic terms used in immunology and allergology;*  *\* structural and functional features of the human immune system;*  *\* have a complete and coherent understanding of immunology as a subject in general, to form an idea of the immune system as one of the most important systems in the body;* | 2 | 30 | 1, 3, 8, 12, 17 | BRAINSTORM, slides, posters, , videos |
| **Topic2.**  **Characteristics of the B-system of immunity** | 2 | *Plan*  *1. Expand \* pathophysiological processes in the body.*  *\* basic terms used in immunology and allergology;*  *\* structural and functional features of the human immune system;*  *\* have a complete and coherent understanding of immunology as a subject in general, to form an idea of the immune system as one of the most important systems in the body;* | 2 | 30 | 2, 3, 5, 11, 16 | BRAINSTORM, slides, posters, , videos |
| **Topic3.**  **3. Characteristics of the T-system of immunity** |  | *Plan*  *\*pathophysiological processes in the body.*  *\* basic terms used in immunology and allergology;*  *\* structural and functional features of the human immune system;*  *\* have a complete and coherent understanding of immunology as a subject in general, to form an idea of the immune system as one of the most important systems in the body;* | 2 | 30 | 2, 3, 5, 11, 16 | BRAINSTORM, slides, posters, RG, videos |
| **Topic4.**  **Phagocytic system, phagocytosis stages** | 5 | *Topic4.*  *Plan*  *Expand the concept of* suspect *immune disorders in the patient;*  *\* justify the need for clinical and immunological examination of the patient;*  *\* correctly interpret the results of the patient's immunological examination;*  *\* use the acquired knowledge of immunology in the study of other biomedical and medical disciplines.*   1. *Form of control: UO, T, NW.* | 2 | 30 | 2,4,12 | BRAINSTORM, slides, posters, RG, videos |
| **Topic5.**  **Complement system** | 3 | *Plan*  *Expand the concept of* suspect *immune disorders in the patient;*  *\* justify the need for clinical and immunological examination of the patient;*  *\* correctly interpret the results of the patient's immunological examination;*  *\* use the acquired knowledge of immunology in the study of other biomedical and medical disciplines.*  *Form of control: UO, T, NW.*  *Form of control: UO, T.* | 2 | 30 | 2, 3, 5, 11, 16 | BRAINSTORM, slides, posters, RG, videos |
| **Topic6.**  **Stages of allergic reactions, their characteristics (immunological, pathochemical, pathophysiological** | 6 | *Plan*  *1. Expand the concept of Expand the concept of* suspect *immune disorders in the patient;*  *\* justify the need for clinical and immunological examination of the patient;*  *\* correctly interpret the results of the patient's immunological examination;*  *\* use the acquired knowledge of immunology in the study of other biomedical and medical disciplines.*  *Form of control: UO, T, NW.*  *Form of control: UO, T, NW.* | 2 | 30 | 2, 4, 8, 13, 14 | BRAINSTORM, slides, posters, RG, videos |
| **Topic7**  **Examples of allergic reactions.** |  | *Plan*  *Expand the concept of* suspect *immune disorders in the patient;*  *\* justify the need for clinical and immunological examination of the patient;*  *\* correctly interpret the results of the patient's immunological examination;*  *\* use the acquired knowledge of immunology in the study of other biomedical and medical disciplines.*  *Form of control: UO, T, NW.* | 2 | 30 | 1,2,4,6. | BRAINSTORM, slides, posters, RG, videos |
| **Topic8**  **Non-specific factors of the body's immune reactivity** | 4 | *Plan*  *1. Expand the concept of food poisoning.*  *2. Demonstrate pathogenesis with a diagram.*  *3. Describe the clinical manifestations of botulism*  *4. Make a treatment plan for the disease botulism, and emergency medical assistance in identifying botulism.*  *5. Recommend for the prevention of food poisoning.*  *Form of control: UO, NW.*  *8.1 PTI (food poisoning)*  *8.2 Diagnosis, treatment, prevention.* | 3 | 1,25 | 6,  12, 15, 16 | BRAINSTORM, slides, posters, RG, videos |
| **Topic9**  **Immunological tolerance and autoimmunity** |  | *Form of control: UO, T, NW* | 3 | 1,25 | 6,  12, 15, 16 | BRAINSTORM, , slides, posters, RG, videos |
| **The Topic10.**  **Complement protein deficiencies and their clinical manifestations** | 7 | *Plan.*  *Form of control: UO, T, NW.*  *Expand the concept of* suspect *immune disorders in the patient;*  *\* justify the need for clinical and immunological examination of the patient;*  *\* correctly interpret the results of the patient's immunological examination;*  *\* use the acquired knowledge of immunology in the study of other biomedical and medical disciplines.*  *Form of control: UO, T, NW.* | 3 | 1,25 | 2, 3, 7, 11 | BRAINSTORM, slides, posters, RG, videos |
| **Total 1 module :** |  |  | 20 | 30 |  |  |

**10.2. Practical classes**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № no. and name of  Topics | Сем  № | Studied questions and tasks | Number of  hour. | Points | Literature | Use of educational technologies | Weeks |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| **Module 1** | | |  |  |  |  |  |
| **Topic1**  **1. The concept of "immunity", central and peripheral organs of the immune system** | 1 | *Plan*  *Expand the concept of* suspect *immune disorders in the patient;*  *\* justify the need for clinical and immunological examination of the patient;*  *\* correctly interpret the results of the patient's immunological examination;*  *\* use the acquired knowledge of immunology in the study of other biomedical and medical disciplines.*  *Form of control: UO, T, NW.* | 2 | 30 | 1, 3, 8, 12, 17 | BRAINSTORM, slides, posters, , videos | 1 |
| **Topic2.**  **Characteristics of the B-system of immunity** | 2 | *Plan*  *1. Expand the concept of* suspect *immune disorders in the patient;*  *\* justify the need for clinical and immunological examination of the patient;*  *\* correctly interpret the results of the patient's immunological examination;*  *\* use the acquired knowledge of immunology in the study of other biomedical and medical disciplines.*  *Form of control: UO, T, NW.*  *Form of control: UO, T, NW.* | 2 | 30 | 2, 3, 5, 11, 16 | BRAINSTORM, slides, posters, , videos | 1 |
| **Topic3.**  **3. Characteristics of the T-system of immunity** |  | *Plan*  *Expand the concept of* suspect *immune disorders in the patient;*  *\* justify the need for clinical and immunological examination of the patient;*  *\* correctly interpret the results of the patient's immunological examination;*  *\* use the acquired knowledge of immunology in the study of other biomedical and medical disciplines.*  *Form of control: UO, T, NW.*  *Control form: UO, T,* | 2 | 30 | 2, 3, 5, 11, 16 | BRAINSTORM, slides, posters, RG, videos | 2 |
| **Topic4.**  **Phagocytic system, phagocytosis stages** | 5 | *Topic4.*  *Plan Expand the concept of* suspect *immune disorders in the patient;*  *\* justify the need for clinical and immunological examination of the patient;*  *\* correctly interpret the results of the patient's immunological examination;*  *\* use the acquired knowledge of immunology in the study of other biomedical and medical disciplines.*  *Form of control: UO, T, NW.*  *Form of control: UO, T, NW.* | 2 | 30 | 2,4,12 | BRAINSTORM, slides, posters, RG, videos | 2 |
| **Topic5.**  **Complement system** | 3 | *Plan*  *Expand the concept of* suspect *immune disorders in the patient;*  *\* justify the need for clinical and immunological examination of the patient;*  *\* correctly interpret the results of the patient's immunological examination;*  *\* use the acquired knowledge of immunology in the study of other biomedical and medical disciplines.*  *Form of control: UO, T, NW.*  *Form of control: UO, T.* | 2 | 30 | 2, 3, 5, 11, 16 | BRAINSTORM, slides, posters, RG, videos | 3 |
| **Topic6.**  **Stages of allergic reactions, their characteristics (immunological, pathochemical, pathophysiological** | 6 | *Plan*  *Form of control: UO, T, NW.* | 2 | 30 | 2, 4, 8, 13, 14 | BRAINSTORM, slides, posters, RG, videos | 3я |
| **Topic7**  **Examples of allergic reactions.** |  | *Plan Expand the concept of* suspect *immune disorders in the patient;*  *\* justify the need for clinical and immunological examination of the patient;*  *\* correctly interpret the results of the patient's immunological examination;*  *\* use the acquired knowledge of immunology in the study of other biomedical and medical disciplines.*  *Form of control: UO, T, NW.*  *Form of control: UO, T, NW.* | 2 | 30 | 1,2,4,6. | BRAINSTORM, slides, posters, RG, videos | 4 |
| **Topic8**  **Non-specific factors of the body's immune reactivity** | 4 | *Plan* | 3 | 1,25 | 6,  12, 15, 16 | BRAINSTORM, slides, posters, RG, videos | 4 |
| **Topic9**  **Immunological tolerance and autoimmunity** |  | *Plan*  *1. Tell the etiology of Botulism.*  *2. Demonstrate pathogenesis with a diagram.*  *3. Describe the clinical manifestations of botulism*  *4. Make a treatment plan for the disease botulism, and emergency medical care for the detection of botulism.*  *5. Recommend for the prevention of food poisoning.*  *Form of control: UO, T, NW* | 3 | 1,25 | 6,  12, 15, 16 | BRAINSTORM, , slides, posters, RG, videos | 5 |
| **The Topic10.**  **Complement protein deficiencies and their clinical manifestations** | 7 | *Plan.*  *Form of control: UO, T, NW.* | 3 | 1,25 | 2, 3, 7, 11 | BRAINSTORM, slides, posters, RG, videos | 5 |
|  |  |  |  |  |  |  |  |
| **Topic11.**  **Assessment of the immune status of a person by immunogram** | 9 | *Plan*  *1.*  *Form of control: UO, T, NW.* | 2 | 30 | 2, 3, 5, 11, 16 | BRAINSTORM, slides, posters, RG, videos | 7 |
| **Topic12.**  **Immunodeficiency of the humoral link of immunity** | 10 | *Plan*  *Form of control: UO, T, NW.* | 3 | 1,25 | 1, 3, 15, 16 | BRAINSTORM, РКС, slides, posters, РИ, videos | 7 |
| **Topic13.**  **Mechanisms of autoimmune pathology, major autoimmune diseases** | 11 | *Plan*  *1 .Compare the measles from rubella.*  *2. Demonstrate clinical manifestations by drawing up a scheme for the period of the disease.*  *3. Class of the disease.*  *4. Make a plan of treatment, specific and pathogenetic therapy, determine the indication for antibiotic therapy.*  *Form of control: UO, T, NW.* | 2 | 30 | 2, 3, 5, 11, 16 | BRAINSTORM, slides, posters, videos | 8 |
| **Topic14**  **The concept of cytokines** |  | *Plan*  *Form of control: UO, T, NW.* | 2 | 30 | 1, 3, 4, 9, 11 | BRAINSTOR, slides, posters, RG, videos | 8 |
| **Topic 15.**  **Allergen-specific immunotherapy: indications and contraindications.** | 12 | *Plan:*  *Form of control: UO, T, NW.* | 2 | 30 | 2, 3, 5, 11, 16 | BRAINSTOR, slides, posters, RG, videos | 9 |
| **The result of 2nd module**  **Total: 45h.** |  |  | 3 | 30 | 2, 4, 11, 17 | BRAINSTORM, slides, posters, RG, videos | 9 |

**8.3. STUDENTS’ INDEPENDENT WORK (SIW)**

|  |  |  |  |
| --- | --- | --- | --- |
| **№ п/п** | **Name of the section of the academic discipline (module)** | **Type of ISW** | **Total hours** |
| 1. | The structure of the immune system | Подготовка к занятиям | 10 |
| 2. | Methods for evaluating the immune system | Подготовка к занятиям | 5 |
| 3. | Mechanisms of development of allergopathology and its main manifestations. | Подготовка к тестированию | 5 |
| 4. | Characteristics of primary and secondary immunodeficiency | Написание рефератов | 5 |
| 5. | Autoimmune pathology | Подготовка к тестированию | 10 |
| 6. | Specific and non-specific immunotherapy | Написание рефератов | 10 |
|  | Total hours | | 45 |

**9. EDUCATIONAL-METHODICAL AND INFORMATION SUPPORT OF THE COURSE.**

**Basic literature** (list according to importance, no more than 3 items)

1. K. Abbas, A. H. Lichtman, S. Pillai : „Basic Immunology. Functions and disorders of the immune system”. Elsevier Saunders, 2011.

2. K. Abbas, A. H. Lichtman, S. Pillai : „Cellular and Molecular Immunology”, 6th Edition, Elsevier, 2012.

3. Peakman M., Vergani D.: “Basic and Clinical Immunology”. Second edition. Elsevier – Churchill Livingstone, 2009Nature reviews. Immunology. Nature New York, London

**Additional literature and other materials** (no more than 3 items)

1. K Immunology, 8th Edition, Elsevier, 2013 Authors: David Male, Jonathan Brostoff, David Roth & Ivan Roitt

2. Allergy: European Journal of Allergy and Clinical Immunology. Wiley Blackwell Journal of Allergy and Clinical Immunology. Elsevier.

**10.EVALUATION INFORMATION**

|  |  |  |  |
| --- | --- | --- | --- |
| *Rating (points)* | *Evaluation by letter system* | *Digital equivalent of the assessment* | *Evaluation by the traditional system* |
| *87 – 100* | *А* | *4,0* | *Excellent* |
| *80 – 86* | *В* | *3,33* | *Well* |
| *74 – 79* | *С* | *3,0* |
| *68 -73* | *D* | *2,33* | *Satisfactorily* |
| *61 – 67* | *Е* | *2,0* |
| *31-60* | *FX* | *0* | *Unsatisfactorily* |
| *0 - 30* | *F* | *0* |

**11. EVALUATION POLICY**

The student can score points in all types of classes. At lectures and seminars - for activity, attendance and availability of abstracts. At the boundary control-a maximum of 30B: for solving situational problems, for solving tests or a written answer. For the implementation of the SRS-points separately according to the plan.

Assessment of students’ knowledge is carried out on a 100 point system as follows:

Assessment at the exams is carried out on the basis of the principles of objectivity, fairness, comprehensive analysis of the quality of students ' knowledge, and Evaluation is the final stage of the student's educational activity aimed at determining the success of training.

The assessment on discipline is exposed as the sum from estimates for modules on which the educational discipline is structured (60 points), and from estimates during final control-examination (40 points).

The module score is defined as the sum of the assessments of the current educational activity and the assessment of the boundary module control, expressed on a multi-point scale (60 points).

**12.** **POLICY OF THE COURSE**

The organization of educational process is carried out on the basis of credit technology of training with application of modular rating system of estimation of progress of students by means of information system AVN.

**Students are presented with the following system of requirements and rules of conduct in the classroom:**

A) Compulsory attendance;

B) Activity during classes;

C) Preparation for classes, homework and SRS.

**Unacceptable:**

\* Being late and leaving classes;

\* Use of cell phones during classes;

\* Deception;

\* Late delivery of tasks.

**Assessment** is the final stage of the student's educational activity aimed at determining the success of training.

**The discipline grade** is exposed as the sum from estimates for modules on which the educational discipline is structured (60 points), and estimates during final control-examination (40 points).

**The module grade** is defined as the sum of the assessments of the current educational activity and the assessment of the boundary module control, expressed on a multi-point scale (60 points).

**I. Module Evaluation**

The module grade is defined as the sum of assessments of the current educational activity (in points) and assessment of the boundary modular control (in points), which is exposed when assessing theoretical knowledge and practical skills. The maximum number of points that a student can score in the study of each module is 30 points, including 20 points for the current educational activity, 10 points for the results of the boundary control (see Annex).

**A) Evaluation of ongoing training activities.**

When assessing the assimilation of each topic of the module, the student is given points for **attendance** and for **passing tests**. This takes into account all types of work provided by the methodological development for the study of the topic.

The weight (price in points) of each test work within one module is the same, but can be different for different modules and is determined by the number of practical exercises in the module (see Appendix.).

The main difference between the **control works** from the current practical classes is that the student must demonstrate the ability to synthesize theoretical and practical knowledge acquired in one control work (semantic module). During control works control questions, tests, a lexical minimum and situational tasks offered in methodical developments for students are considered, and also fixing and control of practical skills on subjects of the semantic module is carried out. Previously studied educational elements are analyzed in terms of morphofunctional relationships and their role in the structure and function of the system, the organism as a whole.

**B) Boundary control (Colloquium)** of semantic modules takes place in two stages:

\* oral interview.

\* written or computer test control;

For testing, 150-200 tests are offered for each topic, from which the computer or teacher randomly selects 40 tests for 3-4 variants. The oral interview is based on the materials of practical, lecture and extracurricular courses. The price in points of boundary control is the same as the price of the current practical training within this module of discipline.

Students are allowed to retake only unsatisfactory grades, positive grades are not retaken.

**Evaluation of the extracurricular work of students.**

A) Assessment of independent work of students. Independent work of students, which is provided on the topic along with classroom work, is evaluated during the current control at the appropriate practical lesson. The level of assimilation of topics that are submitted only to independent work, are evaluated at the boundary control.

B) Assessment of individual work (task) of the student.

Students (optional) can choose one of the individual tasks on the topic of the module. It can be weirs or NIRS in the form of:

\* preparation of the review of scientific literature (abstract);

\* preparation of illustrative material on the topics under consideration (multimedia presentation, a set of tables, diagrams, drawings, etc.);

\* conducting scientific research within the student scientific circle

\* publication of scientific reports, reports at scientific conferences, etc.;

\* participation in Olympiads;

\* Duty in infectious diseases hospital, writing medical history.

Points for individual tasks are awarded to the student only if they are successfully completed and defended (prizes at the relevant competitions). The number of points awarded for individual work is added to the total points scored by the student during the exam.

**II. Final control-exam.**

The final control is carried out at the end of the study of all subjects of the discipline. Students who have attended all classroom training sessions (practical classes, lectures) provided by the curriculum and during the study of the module have gained the sum of points **not less than the minimum number** are allowed to the final control (see Bulletin of OshSU No. 19.).

A student who for a good reason had missed training sessions (practical classes, lectures), is allowed to liquidate academic debt within 2 weeks following the pass. For students who missed classes without good reason, the decision on their working out is taken individually by the Dean's office of the faculty.

- the assessment "well" is exposed to the student who on examination found full knowledge of educational and program material, well executed the tasks provided in the program, passed the module from 34-50 points, and examination from 14-30 points

- evaluation of "satisfactory" is assigned to the student who discovered the knowledge of basic educational material to the extent necessary for further study and future work in the profession, have committed errors in the answer on the exam and while performing the examination tasks, but with the necessary knowledge to address them under the guidance of a teacher who passed the module from 31-45 points, the exam from 11-16 points.

- "unsatisfactory" grade is assigned to the student found gaps in knowledge of basic educational program material that have committed fundamental errors in the implementation of programme tasks, not familiar with the primary literature and not mastered basic knowledge, the scores below 31 are not allowed on the exam if above 31 points, and got in the exam total below 61 points.

**Control questions for the exam (test).**

1. The concept of "immunity", central and peripheral organs of the immune system

2. Feature In the immune system

3. Characterization of the T-system of immunity

4. The phagocytic system, stages of phagocytosis

5. Complement system

6. Stages of allergic reactions, their characteristics (immunological, pathochemical pathophysiological)

7. Examples of allergic reactions

8. Non-specific factors of the body's immune reactivity. Immunological tolerance and autoimmunity

10.Deficiencies of the proteins of the complement system and their clinical manifestations 11.The immune status of human immunity

12.Immunodeficiencies humoral immunity

13.Immunodeficiencies cellular immunity

14.Immunodeficiencies system of phagocytosis

15.Immunodeficiencies system compliment

16 Mechanisms of autoimmune disorders, major autoimmune diseases

17. The concept of cytokines

18. Main types of proinflammatory cytokines

19. Effects of proinflammatory cytokines on the human body

20.Main types of anti-inflammatory cytokines

21. The role of cytokines in immune pathology

22. Immunocorrection in allergopathology

23. Allergen-specific immunotherapy: indications and contraindications.