



MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN  
FEDERATION  
Federal state autonomous educational institution  
of higher education  
«Far Eastern Federal University»  
(FEFU)

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**SCHOOL OF BIOMEDICINE**

«AGREED»

Head of education program  
«General medicine»

Khotimchenko Yu.S.

(signature)

(Full name)

«09» of July 2019

«APPROVED»

Director of the Department of Clinical  
Medicine

Geltser B.I.

(signature)

(Full name)

«09» of July 2019



**WORKING PROGRAM OF ACADEMIC DISCIPLINE (WPAD)**

«Hygiene»

Education program

Specialty 31.05.01 «General medicine»

**Form of study: full time**

year 3,4, semester 6,7  
lectures 36 hours  
practical classes 108 hours  
laboratory works not provided  
total amount of in-classroom works 144hours  
independent self-work 108 hours  
including preparation to exam 36 hours  
pass-fail exam year 3, semester 6  
exam year 4, semester 7

The working program is drawn up in accordance with the requirements of the Federal state educational standard of higher education (level of training), approved by the order of the Ministry of education and science of the Russian Federation from 09.02.2016 № 95.

The working program of the discipline was discussed at the meeting of the Department of fundamental and clinical medicine. Protocol No. 8, 09 of July 2019

Author: PhD Sakharova O.B.

## **Annotation to the Work Program for the subject «Hygiene»**

The discipline " Hygiene "is intended for students enrolled in the educational program 31.05.01" General Medicine", is included in the basic part of the curriculum.

Discipline is realized on 3, 4 courses, 6, 7 semesters.

In the development of the working program of the discipline used the Federal state educational standard of higher education in the specialty 31.05.01 "General Medicine", the curriculum for training specialists in the specialty 31.05.01"General Medicine".

The total complexity of the development of the discipline is 7 credits, 252 hours. The curriculum provides 36 hours of lectures, 108 hours of practical training and independent work of the student (108 hours.).

Development of students ' conscious understanding of the relationship of human health with the environment, factors and living conditions, work is a necessary prerequisite for their active participation in the conduct of evidence-based and effective therapeutic measures, disease prevention, promotion of healthy lifestyles.

The study of hygiene is of particular importance in the formation of medical activity, in solving the list of problems for the prevention of diseases listed in the Federal state educational standard, in the development of environmental thinking of students.

A special feature in the construction and content of the course is the use of active learning methods, software and hardware, Fund methodical, evaluation and electronic means of discipline.

The discipline " Hygiene "is logically and meaningfully connected with such courses as" Biology", " Microbiology", " General and medical chemistry", "Medical Informatics, mathematics".

The course program is based on the basic knowledge gained by students:

- the willingness to solve common tasks of professional activity with the use of information and bibliographic resources , biomedical terminology , information and communication technologies , taking into account the main requirements for information security (GPC – 1)

- readiness to use basic physical, chemical, mathematical and other natural science concepts and methods in solving professional problems (GPC-7);

- the ability and willingness to conduct epidemiological protection, to organize the protection of public health in the focal points of especially dangerous infections, in case of degradation of the radiation situation, natural disasters and other emergency situations (PC – 3)

- the readiness for educational activities to eliminate the risk factors and promote healthy lifestyles (PC – 16)

The purpose of the discipline "Hygiene" is the formation of students ' natural science worldview, preventive thinking on the basis of hygienic and environmental knowledge, competencies in systemic fundamental knowledge, skills in hygiene and human ecology, necessary for the subsequent practice of the doctor.

Objectives of the discipline:

\* acquisition of students ' knowledge in the field of human hygiene and ecology, a systematic understanding of the interaction of the body and various environmental factors;

\* formation of students ' practical knowledge, skills and abilities to identify and assess environmental pollution, the development of sanitary and hygienic and anti-epidemic measures;

\* mastering the methods of hygienic assessment of the main environmental factors affecting the health of the population;

\* formation of motivation to preserve and strengthen health;

\* knowledge of the basics of legislation on sanitary-epidemiological and environmental well-being of the population, international and national hygienic and environmental standards;

\* teaching students statistical methods of work with hygienic and environmental information;

\* development of skills in the study of scientific literature and official statistical surveys.

As a result of studying this discipline the following General cultural and General professional competences (elements of competences):

<b>Competence code and formulation</b>	<b>Stages of forming the competence</b>	
PC-1  the ability and willingness to implement a set of measures aimed at the preservation and promotion of health. It includes the formation of a healthy lifestyle, the prevention of occurrence and (or) the spread of diseases, their early diagnosis, the identification of their causes, as well as this set is aimed at elimination of harmful effects of environmental factors on human health	Knows	the information sources of reference and regulatory nature, the main regulatory documents relating to the organization and control of the sanitary and hygienic state of various institutions; the environmental factors affecting human health and livelihoods; mechanisms of influence of various factors on the human body; the modern requirements for sanitary and hygienic and anti-epidemic regime of various medical institutions
	Is able to	work independently with educational, scientific, regulatory and reference books, to conduct a search, turn the information obtained into a means for solving professional problems; determine and evaluate the parameters of the microclimate of industrial premises of various medical institutions; carry out instrumental and computational definitions of the natural and artificial illumination of the premises; evaluate the effectiveness of natural and artificial ventilation of the premises; evaluate the quality of drinking water; calculate the number of bactericidal irradiators in disinfecting the air and surfaces of the premises; assess the energy and nutritional value of the daily human diet, taking into account the coefficient of physical activity
	Possesses	methods of planning and developing a scheme of biomedical experiments; methods of assessing the health and physical

		development of the population, assessing the functional state of the central nervous system and mental performance; methods of conducting specific preventive measures to examine the conditions of external factors and the working environment; methods of assessing the health and physical development of the population, assessing the functional state of the central nervous system and mental performance
PC-15 the willingness to help patients and their relatives to get basic health habits, to get abilities of self-control of basic physiological features, which contribute to the prevention of diseases and health promotion	Knows	the basics of a healthy lifestyle as a factor in his safe life activity; the occupational hazards and prevention of occupational pathology of a doctor; the basic hygiene measures of a health-improving nature, basic physiological indicators that contribute to the preservation and promotion of health, and the prevention of diseases
	Is able to	teach people basic hygiene measures improving character, self-control skills in vital signs, contributing to the preservation and promotion of health, prevention of diseases
	Possesses	methods of hygienic education and education of the population; skills of organizational and methodological work in the field of health planning
PC-16 the readiness for educational activities to eliminate the risk factors and promote healthy lifestyles	Knows	the risk factors and healthy lifestyle skills
	Is able to	carry out informational, educational and sanitary - educational work
	Possesses	education skills to eliminate risk factors and develop healthy lifestyle habits

**I. STRUCTURE AND CONTENT OF  
THE THEORETICAL PART OF THE COURSE (36 hours)**

**Semester 6**

**SECTION 1 Modern hygiene and its place in medicine (2 hours)**

**The theme 1 Modern hygiene and its place in medicine (2 hours)**

Hygiene as a basic preventive science. History of hygiene. The principal branches of hygiene. Methodology of hygiene. Hygienic standardization. Structure of the sanitary service of the Russian Federation.

## **SECTION 2 Public health and the environment (10 hours)**

### **The theme 2 Hygienic characteristic of environmental factors. Hygiene of atmospheric air (2 hours)**

The environment as a combination of natural, anthropogenic and social factors. Modern problems of hygiene of atmospheric air. Hygienic rationing of the chemical composition of atmospheric air in populated areas. Sources of air pollution, their hygienic characteristics. Measures to protect the air environment. Sources of indoor air pollution. Hygienic requirements for ventilation of premises.

### **The theme 3 Climate and health. Microclimate and its hygienic meaning (2 hours)**

Hygienic significance of climate and weather. General and physiological-hygienic characteristics of climatic and weather conditions in Primorsky Krai. Microclimate and its hygienic value. Solar radiation and its biological effect. Hygienic assessment of the insolation regime, natural and artificial lighting of institutions.

### **The theme 4 The hygienic significance of water (2 hours)**

Physiological, hygienic, epidemiological significance of water. Diseases associated with salinity or microelement content of water. Comparative estimation of the sources of water supply. Main sources of water pollution. Measures to protect water sources from pollution.

### **The theme 5 Hygienic evaluation of the quality of drinking water and water supply (2 hours)**

Hygienic requirements and standards for drinking water quality (organoleptic and microbiological indicators, chemical composition). Methods for improving water quality. Water supply systems. Requirements for water

quality of centralized water supply. Requirements for water quality of non-centralized water supply.

**The theme 6. Soil and its hygienic importance (2 hours).**

Hygienic value, composition and properties of soil. Natural and artificial biogeochemical provinces. Epidemiological importance of soil. Main sources of soil pollution. Measures to protect soil from pollution. Waste disposal.

**SECTION 3 Nutrition and Health (6 hours)**

**The theme 7 Hygienic evaluation of nutrition (2 hours)**

The value of nutrition for growth, development and health of the population. Methods for assessing the nutrition of the population. The nutritional status assessment. Methods for determining energy expenditure. Principles of rational diet. Physiological norms of nutrition.

**The theme 8 The role of proteins, fats, carbohydrates, vitamins and minerals in human nutrition (2 hours)**

Characteristic physiological norms of nutrition. Proteins of animal and vegetable origin, their sources, hygienic value. Fats of plant and animal origin, their sources, their role in human nutrition. Simple and complex carbohydrates, their sources, hygienic value. Definition, classification, value of individual minerals in human nutrition. The need, the physiological value, the source products of individual fat and water-soluble vitamins.

**The theme 9 Nutrition-dependent diseases, their prevention (2 hours)**

Classification of alimentary-dependent diseases. Food poisoning and their classification. Food poisoning of microbial etiology. Toxicoinfection of various etiologies. Botulism, staphylococcal toxicosis. The role of food in the occurrence of microbial food poisoning of various etiologies. Food poisoning of non-microbial etiology. Mycotoxicosis: ergotism, fusarium, aflatoxicosis. Prevention of food poisoning. The role of the attending physician in the investigation of food poisoning and the organization of preventive measures.

The consequences of eating disorders and imbalances. Prevention of diseases associated with malnutrition and excess nutrition.

**7 semester (18 hours)**

**SECTION 4 Occupational Hygiene (6 hours)**

**The theme 10 Occupational health and health protection of workers.**

**Fundamentals of the physiology of labor (2 hours)**

Fundamentals of the physiology of labor. Changes in the human body in the process of work. Fatigue, overwork, overstrain and their prevention. Mental and physical labor. Hygienic classification and criteria for assessing working conditions according to indicators of hazard and danger of factors of the working environment, severity and intensity of the labor process The impact of working conditions on the health of workers. Occupational hazards, occupational and occupational diseases. Hygienic rationing of factors of the production environment. Fundamentals of legislation on labor protection, legal norms, labor protection of women and adolescents. Occupational health of doctors and hygienic requirements for the working conditions of medical personnel. Groups of production factors that shape the working conditions of doctors. Etiological factors in the occurrence of occupational pathology of doctors.

General principles of recreational activities at work: technological, sanitary and medical and preventive. Organization and procedure for conducting preliminary and periodic medical examinations.

**The theme 11 Hygienic assessment of the physical factors of the production environment (2 hours).**

Industrial dust. Professional dust diseases, their prevention. Noise and vibration. The effect of noise and vibration on the body. Measures that prevent the harmful effects of noise and vibration, their role in the formation of a healthy lifestyle. Microclimate and its hygienic value. Types of microclimate



and the effect of uncomfortable microclimate on heat transfer and human health. Electromagnetic radiation, the principles of hygienic regulation.

### **The theme 12 Basics of industrial toxicology (2 hours)**

Definition and classification of industrial poisons. Kinetics of industrial poisons in the body. The concept of the combined, complex and combined effects of toxic substances. The concept of acute and chronic occupational poisoning, their prevention.

### **SECTION 5 Radiation hygiene (2 hours)**

#### **The theme 13 Basics of radiation hygiene (2 hours)**

Fundamentals of nuclear physics. The main laws of action of ionizing radiation on the human body. The effect of ionizing radiation at the cellular level. The effects of the biological effects of ionizing radiation: deterministic and stochastic, somatic and hereditary, acute and distant. Acute and chronic radiation sickness. Principles of hygienic regulation of ionizing radiation. Ensuring radiation safety in medical institutions. Organization of medical care for persons working with sources of ionizing radiation.

### **SECTION 6 Hospital hygiene (2 hours)**

#### **The theme 14 Hygiene of treatment-and-prophylactic institutions (2 hours)**

The main tasks of hospital hygiene. Modern hygienic problems of hospital construction. Hygienic requirements for the choice of territory, placement, composition and layout of rooms, lighting, ventilation, heating, interior decoration and equipment. Basic regulatory documents. Requirements for equipment aseptic unit. The system of sanitary and hygienic measures to create a protective regime and favorable conditions for patients in a hospital. Microclimate, indicators of natural and artificial light, types of insolation mode, sources of air pollution in hospital premises. Methods of air rehabilitation. Elements of sanitary improvement of hospitals - heating, ventilation, water

supply, sewage, their hygienic assessment. Sanitary rules for the discharge and treatment of hospital wastewater, the collection and disposal of solid waste. Hygienic aspects of the prevention of nosocomial infections.

## **SECTION 7 Hygiene of children and adolescents (4 hours)**

### **The theme 15 The main problems of hygiene of children and adolescents. Methods for assessing physical development (2 hours)**

The main problems of hygiene of children and adolescents. Environmental factors and social conditions of life that affect the processes of shaping the health of children and adolescents. Patterns of growth and development of the child's body. Indicators of individual health, the medical classification of children's health, the health groups of children and adolescents. Physical development as an important criterion for assessing health status. Methods for assessing physical development. Assessment of the level of biological development using complex methods. The concept of biological and calendar age. Indicators of the level of biological development of children and adolescents. Modern ideas about epochal and intra-age acceleration and retardation.

### **The theme 16. Hygienic assessment of the educational regime of children of different age groups (2 hours).**

Age and sex, anatomical, physiological and psychophysiological features of the body of children and adolescents. Medical, physiological and psychological-pedagogical criteria for assessing the level of development of the child. Health problems and diseases that may be due to the influence of adverse factors of the educational process. Concept of school maturity. Hygienic bases and methods for determining the functional readiness of a child for school. Hygienic requirements for the organization of educational work in secondary schools. The concept of the daily mode and the main regime elements. Features hygienic rationing mode daily activities of students. Hygienic principles of drawing up the regime of the day for children and teenagers. Features of teaching children

six years of age. Features of the educational process in new promising educational institutions (gymnasium, lyceum, college, etc.), specialized schools, children's sanatoriums and recreational facilities. Hygienic requirements for the organization of extracurricular activities and free time of students.

## **SECTION 8 Hygiene of inhabited places and dwellings (2 hours)**

### **The theme 17 Hygienic problems of cities. Hygiene of residential and public buildings (2 hours)**

Town-forming factors and the structure of the modern city. Environmental problems in various types of infrastructure of populated areas. Features of the formation of the environment in cities. Pollution of air, water, soil. Noise as a factor in the human environment. The electromagnetic field of radio frequencies, its role as an environmental factor, measures to prevent exposure to microwave radiation.

The state of public health in modern cities. Hygienic issues of urban planning and development, the principle of functional zoning of the city. City improvement activities. The role of green spaces, water bodies, recreational areas, their hygienic value.

Hygiene of residential and public buildings. The main sources of indoor air pollution. The role of polymeric materials. Chemical and bacteriological pollution of indoor air, sanitary-indicative value of the content of silicon dioxide, formaldehyde, etc. in the indoor air. Adverse prevention

effects of physical and chemical factors on the body during the operation of household appliances.

## **SECTION 9 Healthy lifestyle (2 hours.)**

### **The theme 18 Healthy lifestyle and personal hygiene issues. Hygienic education and training (2 hours)**

Hygienic principles of a healthy lifestyle, importance for the preservation of health and active longevity. Health criteria, classification. Mode of work and rest. Hypodynamia, its effects and prevention. The role of physical culture in

the mobilization of the adaptive capabilities of the human body. Active and passive recreation. The influence of neuro-emotional factors and stress loads on health. Fundamentals of mental hygiene, the value of the psychological adaptation of a person in the team, family, in different age periods. Socio-hygienic value of bad habits. Sanitary-educational work with the population.

Personal hygiene as part of public hygiene. Hygiene of the body and skin, functional value of the skin, ways of its pollution. Prevention of pustular diseases, sweating, chafing, diaper rash, athlete's disease. Hygiene of the teeth and oral cavity. Oral care products. Hardening of the body. The concept, value, basic principles (gradual, systematic, comprehensive, taking into account the state of health). Means and methods of hardening. The method of hardening air, sun, water.

## **II. THE STRUCTURE AND CONTENT OF THE PRACTICAL PART OF THE COURSE (108 hours)**

### **Semester 6 (54 hours)**

#### **Topic 1. Modern hygiene and its place in medicine (4 час.)**

1. The subject, content and tasks of hygiene, links with other disciplines.
2. Factors affecting human health.
3. The interaction of man and the environment. Influence of social and natural factors on public health.
4. The concept of primary, secondary and tertiary prevention.2. History of hygiene.
3. The principal branches of hygiene.
4. Methodology of hygiene.
5. Hygienic standardization.
6. Structure of the sanitary service of the Russian Federation.

#### **Topic 2. Hygiene of atmospheric air (4 hours)**

1. Modern problems of hygiene of atmospheric air.

2. Hygienic rationing of the chemical composition of atmospheric air in populated areas.

3. The nitrogen content in the atmospheric air, its value for the organism.

4. The oxygen content in the atmospheric air, its value for the organism.

5. The carbon dioxide content in the atmospheric air, its physiological and hygienic value.

6. The ozone content in the atmospheric air, its hygienic value.

7. Gas admixtures in the atmospheric air (carbon oxide CO, sulphur dioxide SO<sub>2</sub>, hydrogen sulphide H<sub>2</sub>S, dioxide of nitrogen NO<sub>2</sub>), their effect on the human health.

8. Measures to protect the air environment.

9. The effect of air pollutants on health and sanitary life style.

10. Sources of indoor air pollution.

11. Types of ventilation.

12. Hygienic requirements for ventilation of premises.

**Topic 3. Hygienic evaluation of ventilation capacity and air change rate in the indoor environment (4 hours).**

1. Indoor air environment (chemical composition of the air, factors contributing to its formation).

2. Microbial contamination of the indoor environment.

3. Criteria to estimate indoor air quality.

4. The notion of ventilation. Natural, artificial ventilation, air-conditioning; rules of their installation.

**Topic 4. Hygienic significance of climate, weather and microclimate. (4 hours)**

1. Hygienic significance of climate and weather.

2. Factors that form the weather.

3. Factors that characterize the weather.

4. Main climate-forming factors.

5. The medical classification of weather.
6. Heliometeorotropic (meteotropic) reaction, its effects on human health.
7. The prevention of geliometeotropyh reactions.
8. General and physiological-hygienic characteristics of climatic and weather conditions in Primorsky Krai.
9. Microclimate and its hygienic significance.
10. Instruments for measuring of microclimate parameters, principles of their device and using.
11. Mechanisms of heat production.
12. Heat transfer mechanisms.
13. Types of microclimate.
14. The effect of the cooling microclimate on the human body.
15. The effect of the heating microclimate on the human body.
16. The consistency of heating system.
17. Hygienic requirements for heating.
18. Components of the solar spectrum.
19. Biological effects of infrared (thermal) radiation.
20. Biological effects of ultra-violet irradiation.
21. Biological effect of visible, or optical, radiation.
22. Hygienic assessment of the insolation regime, natural and artificial lighting of premises.
23. Sources of artificial lighting of premises.
24. Methods of natural lighting assessment.
25. Methods of artificial lighting assessment.

**Topic 5. Hygienic evaluation of natural and artificial lightening of living, educational, and medical premises (4 hours)**

1. Light and lighting. Hygienic importance of lighting.
2. Hygienic evaluation of insolation mode in living rooms, educational establishments and patient care institutions.

3. Hygienic evaluation of indoor natural lighting.
4. Hygienic evaluation of indoor artificial lighting.
5. Physiological methods of evaluating lighting sufficiency.

**Topic 6. Hygiene of water (4 hours)**

1. Physiological, hygienic, epidemiological significance of water.
2. Diseases associated with salinity or microelement content of water.
3. Comparative estimation of the sources of water.
4. Main sources of water pollution.
5. Measures to protect water sources from pollution.
6. Hygienic requirements and standards for drinking water quality (organoleptic and microbiological indicators, chemical composition).
7. Methods for improving water quality.
8. Water supply systems.
9. Requirements for water quality of centralized water supply.
10. Requirements for water quality of non-centralized water supply.

**Topic 7. Soil and its hygienic importance. (2 hours)**

1. Hygienic value, composition and properties of soil.
2. Natural and artificial biogeochemical provinces.
3. Epidemiological importance of soil.
4. Main sources of soil pollution.
5. Measures to protect soil from pollution.
6. Waste disposal.

**Topic 8. Examination on the theme «Public health and the environment» (2 hours)**

1. Test control.
2. Solving of Case studies.

**Topic 9. Nutrition and public health. Hygienic basis of nutrition (4 hours)**

1. The value of nutrition for health, physical development and health of the population.

2. Methods for assessing the nutrition of the population.

3. The concept of food status.

4. Methods for determining the daily energy consumption.

5. The concept and principles of nutrition.

6. Characteristics of the physiological norms of nutrition.

**Topic 10. Hygienic assessment of nutritional value (4 hours)**

1. Hygienic assessment of essential nutrients: proteins, fats, carbohydrates.

2. Water and fat soluble vitamins, their role in human life.

3. Micro and macro elements in human nutrition.

4. Physiological norms of nutrition, their characteristics.

5. Daily energy consumption, its components, methods of determination.

6. Menu-layout, basic principles and methods of compilation.

7. Essential nutritional substances.

**Topic11. Methodology for assessing the adequacy of nutrition, nutritional status (4 hours)**

1. The essence of metabolism and energy in the body.

2. Feeling of satiety, assimilation of food and factors determining them.

3. Daily energy consumption, its components, methods of determination.

4. Rational, balanced nutrition, their definition and meaning.

5. Diet, its main elements.

6. Food status, its types, value.

7. Clinical symptoms of inadequate nutrition.

8. Methods for assessing the adequacy of nutrition, nutritional status.

9. Doing practical work.

10. Protection of practical work performed.

**Topic 12. Food safety. Prevention of food poisoning (4 hours)**

1. Food safety risk factors.



2. The concept of food poisoning. Modern classification of food poisoning.
3. The duties of a physician in the investigation of food poisoning.
4. Causative agents of toxicoinfections and food products that cause them.

Prevention.

5. Botulism, preventive measures.
6. Staphylococcal intoxication, prevention.
7. Mycotoxicosis, prevention.
8. Food poisoning of non-microbial origin, their prevention.

**Topic13. Nutrition and biological value of food of animal and vegetable origin (2 hours)**

1. Food and biological value of meat and meat products.
2. Nutritional and biological value of fish and seafood.
3. Nutrition and biological value of vegetables and fruits.
4. Nutritional and biological value of milk and dairy products.
5. Nutrition and biological value of grain and flour products.
6. Nutritional and biological value of eggs.

**Topic 14. Examination on the theme “Food Hygiene” (2 hours)**

1. Test control.
2. Solving of Case studies.

**Topic 15. The final lesson. Protecting of presentations. Credit (2 hours)**

**Semester 7 (54 hours)**

**Topic 16. Introduction to occupational health. Fundamentals of the physiology of labor. The concept of the severity and intensity of the labor process (4 hours)**

1. Occupational hygiene: subject, content.
2. Basic legislation on labor protection, legal norms, labor protection of women and adolescents.

3. The concept of harmful and hazardous production factors: their classification, causes and

impact on performance and health.

4. The concept of the integrated, combined and combined action of production factors.

5. Modern principles of classification of working conditions, severity and intensity of the labor process.

6. Fundamentals of the physiology of labor. Principles of central nervous regulation of work. Dominant, dynamic production stereotype.

7. Mental and physical labor. Types of physical labor. Local, regional, global physical work.

8. Types of mental labor. Camera work. Changes in the human body in the process of work. The state of higher nervous activity in various types of labor (memory, attention, thinking, psychomotor activity, etc.); emotions, their role in the labor process.

9. Prevention of diseases associated with high levels of neuropsychic tension, intensification of production processes. Hygiene of mental labor.

10. Dynamics of performance during the working day.

11. Fatigue and its manifestations in terms of performance, condition physiological functions of the body. Overwork and overstrain. Occupational diseases as a result of overwork and overstrain. Measures to prevent overwork.

12. Hypokinesia, hypodynamia, monotony.

13. Features of working conditions in the modern period.

**Topic 17. Methods of hygienic assessment of the intensity of labor in order to prevent overwork and increase working capacity (4 hours)**

1. Types of labor, their physiological and hygienic characteristics. Physical labor, its severity and intensity. Mental labor, its tension. Features of labor operator.

2. Physiological changes in the body working in the process of physical, mental and camera work. Fatigue and overwork, explanation and scientific rationale for their development.

3. Modern principles and criteria for the hygienic assessment of labor and its classification by severity and intensity.

4. The system of preventive measures for the rational organization of the labor process. Psychophysiological professional selection, diagnosis of psychosocial fatigue.

5. Doing practical work.

6. Protection of practical work performed.

**Topic 18. Prevention of diseases associated with the effects of physical production factors (adverse microclimate, infrared radiation, electromagnetic radiation, barometric pressure, noise, vibration) (4 hours)**

1. Hygienic requirements for sanitary devices at industrial enterprises (ventilation, lighting, heating, etc.).

2. Microclimatic conditions in various industrial premises.

3. Production microclimate: concept, types. Characteristics of the main parameters (temperature, humidity, speed, air movement, infrared radiation), methods for their evaluation. Infrared radiation: its sources in production. Hygienic principles of rationing the production microclimate.

4. Features of the microclimate in different types of work in enclosed spaces and in the open air. Hot and cold shops. The influence of individual parameters of the microclimate on human heat transfer (physical and chemical thermoregulation). The biological effect of the main parameters of the microclimate on the human body and its performance.

5. The nature of the incidence of workers in the performance of work in conditions of adverse microclimate (heating, cooling).

6. Preventive measures when exposed to adverse industrial microclimate: collective and individual means of protection, work and rest, treatment and

preventive measures, contraindications to work in conditions of adverse microclimate.

7. The specific and non-specific effect of noise on the body. Disorder the function of the organ of hearing. Hygienic characteristics of impulse noise and its role in the development of sensorineural hearing loss.

8. Hygienic characteristics and rationing of vibration.

9. Local and general manifestations of vibration disease. Hygienic prevention of the adverse effects of vibration. Legislative and administrative activities. Organizational events. Technological events. Sanitary measures. Means of collective and individual protection. Therapeutic and prophylactic measures.

10. Hygienic characteristics of natural and anthropogenic infrasound, effects on the body, hygienic regulation. Prevention of the adverse effects of infrasound.

11. Biological effects of ultrasound. Effect on the body of low and high frequency ultrasound.

12. Hygienic characteristics and hygienic rationing of static electric fields, constant magnetic fields, electromagnetic radiation (fields) of industrial frequency and radio frequency range.

13. Barometric pressure as a leading production factor. Diseases caused by high and low barometric pressure. Manifestations and prevention of caisson, altitude and flight diseases.

**Topic 19. Hygienic assessment of working conditions at the workplace (4 hours)**

1. The concept of the microclimate and the factors characterizing it.

2. General methods of hygienic study of meteorological factors and indoor microclimate.

3. Systems for providing microclimate parameters for residential and industrial premises. Heating, ventilation, air conditioning.

4. Determination of the intensity and hygienic assessment of artificial lighting.

5. Doing practical work.

6. Protection of practical work performed.

**Topic 20. Basics of industrial toxicology. Principles of hygienic rationing of toxic substances in production conditions (4 hours)**

1. Industrial dust. Dust classification Aerosols of disintegration and condensation.

2. Occupational diseases caused by dust. Specific and non-specific action.

3. Pneumoconiosis, etiology, pathogenesis, clinic. Silicosis. Asbestosis and other types of silicatoses. Anthracosis: Metallioniozy.

4. Other dust diseases of the respiratory system (bronchitis, bronchial asthma, etc.). Diseases of the skin, eyes, digestive organs when exposed to dust. Dust and tuberculosis.

5. Methods and means of combating dust in a production environment. The state system of measures for the prevention of dust diseases. Principles of MPC regulation of various types of dust. Personal protective equipment. Therapeutic and prophylactic measures.

6. Classification of industrial poisons. Toxicokinetics: value, factors affecting the dynamics, metabolism, nature of the toxic action of a harmful substance. The main stages of intoxication. Acute and chronic occupational poisoning. The main causes of poisoning.

7. Features intermittent action poisons. The concept of a comprehensive, combined and combined action. Long-term effects of poisons (gonadotropic, embryotropic, etc.). Addictive to poisons. Production poisons as allergens. Nonspecific effect of production poisons. The main directions of the prevention of poisoning.

8. Toxicometry: meaning. The main parameters, methods and methods of determination. The concept of "toxicity" and "danger". Classification. The

concept of MAC, SEC, value. The concept of maximum single and medium shift concentrations. Therapeutic and preventive measures when working with poisons, the importance of early diagnosis of intoxication.

9. The most important industrial poisons and the production poisonings caused by them: metals, organometallic compounds, organic solvents, irritating gases and other main production and works related to the possibility of individual industrial poisons on the body. Prevention of intoxication.

10. Bio-objects (microorganisms - producers, etc.). Hygiene problems when using. Ways of impact on workers when they are received and applied. Hygienic control and evaluation. The nature of the effect on the body, general and occupational morbidity. Measures and means of prevention. Therapeutic and prophylactic measures. Sanitary legislation and regulations.

**Topic 21. Hygiene of medical institutions. Features of the professional activity of doctors (4 hours.)**

1. The main tasks of hospital hygiene.

2. Hygienic requirements for the choice of territory, placement, composition and layout of rooms, lighting, ventilation, heating, interior decoration and equipment. Basic regulatory documents.

3. The system of sanitary and hygienic measures to create a protective regime and favorable conditions for patients in a hospital.

4. Microclimate, indicators of natural and artificial light exposure, types of insolation regime, sources of air pollution in hospital premises.

5. Sanitary rules for the discharge and treatment of hospital wastewater, the collection and disposal of solid waste.

6. Hygienic aspects of the prevention of nosocomial infections.

7. Planning, sanitary and disinfection measures. Sanitary-hygienic and anti-epidemic regime of the hospital.

8. Occupational health of doctors and hygienic requirements for the working conditions of medical personnel. Groups of production factors that shape the

working conditions of doctors. Etiological factors in the occurrence of occupational pathology of doctors.

**Topic 22. Examination on the theme “Occupational hygiene” (4 hours)**

1. Test control.
2. Solving of Case studies.

**Topic 23. Subject, tasks, history of the development of hygiene of children and adolescents. Comprehensive assessment of the health status of children and adolescents; criteria and health groups. The physical development of children and adolescents as an indicator of health (4 hours)**

1. The subject, goals, objectives, basic problems of hygiene of children and adolescents.
2. Environmental factors and social conditions of life that affect the processes of shaping the health of children and adolescents. School diseases, causes, prevention.
3. General patterns of growth and development of children and adolescents. Evaluation criteria and health indicators for children and adolescents.
4. Comprehensive assessment of the health status of children and adolescents.
5. Indicators of individual health, the medical classification of children's health, the health groups of children and adolescents. Technology for determining health groups. Genealogical history, compilation of a pedigree sheet, calculation of the index burden of hereditary history. Definition of children's health groups.
6. Physical development as an important criterion for assessing the state of health. The main indicators of physical development. Acceleration, deceleration.
7. The concept of biological and calendar age. Indicators of the level of biological development of children and adolescents. Modern ideas about epochal and intra-age acceleration and retardation.

8. The tasks of the doctor in organizing and conducting recreational activities in children's groups (schools, gymnasiums, lyceums, colleges, boarding schools, vocational schools, orphanages, pre-school institutions, labor camps and recreation camps). The health management system of children and adolescents.

**Topic 24. Methods for assessing the health and physical development of children and adolescents (4 hours)**

1. Methods of comprehensive assessment of the health status of children and adolescents. Features of the distribution of children and adolescents in health groups.

2. Physical development as an important criterion for assessing health status. The main indicators of physical development.

3. Rules of anthropometry. Requirements for tables of regional standards of physical development.

4. Methods for assessing the physical development of children and adolescents (the method of sigmal deviations, estimation by regression scales, complex and centered methods).

5. Methods for assessing the health and physical development of organized children's groups.

**Topic 25. Methods for studying the age-related psycho-physiological characteristics of children and adolescents. Hygienic assessment of the educational regime of children of different age groups (4 hours)**

1. Age-sex, anatomical, physiological and psycho-physiological characteristics of the body of children and adolescents.

2. Medical, physiological and psychological-pedagogical criteria for assessing the level of child development. Methods for studying the age-related psycho-physiological characteristics of the body of children and adolescents.

3. Violations of health and diseases that may be caused by the influence of adverse factors of the educational process.



4. The concept of school maturity. Hygienic bases and methods for determining the functional readiness of a child for school.

5. Hygienic requirements for the organization of educational work in general education schools.

6. The concept of the daily mode and the main regime elements. Features hygienic rationing mode daily activities of students. Hygienic principles of drawing up the regime of the day for children and teenagers.

7. Hygienic requirements for the schedule of classes at school and methods of its evaluation.

8. Hygienic requirements for the organization and methodology of the lesson. Features of teaching children six years of age.

9. Hygienic requirements for teaching aids for children of school age.

10. Features of the educational process in new prospective educational institutions (gymnasium, lyceum, college, etc.), specialized schools, children's sanatoriums and recreational facilities.

11. Hygienic requirements for the organization of extracurricular activities and free time of students.

### **Topic 26. Hygienic assessment of the nutrition of children and adolescents (4 hours)**

1. The importance of nutrition for the health and physical development of children and adolescents.

2. Natural and artificial feeding of children of the first year of life.

3. Introduction of complementary foods.

4. The concept and principles of nutrition.

5. Quantitative and qualitative nutritional value, balanced diet.

6. Diet.

7. Characteristics of the physiological norms of nutrition.

8. Proteins, fats, carbohydrates; their value, rationing and sources of nutrition.

9. Vitamins, mineral salts, trace elements; their value, rationing and sources of nutrition

10. Hygienic assessment of nutritional value. Alimentary-dependent diseases, causes, prevention.

11. Assessment of the adequacy of individual nutrition by macronutrient composition and energy.

12. Assessment of the adequacy of individual nutrition by micronutrients: vitamins, minerals and dietary fiber.

13. Medical control over the organization of food in children's educational institutions.

**Topic 27. Examination on the topic "Hygiene of children and adolescents" (4 hours)**

1. Test control.

2. Solving of Case studies.

**Topic 28. Healthy lifestyle and personal hygiene issues. Hygienic education and training (4 hours)**

1. Hygienic principles of a healthy lifestyle, importance for the preservation of health and active longevity.

2. Health criteria, classification.

3. Mode of work and rest.

4. Hypodynamia, its effects and prevention.

5. Effect of neuro-emotional factors and stress loads on health.

6. Fundamentals of mental hygiene, the value of the psychological adaptation of a person in the team, family, in different age periods.

7. The socio-hygienic value of bad habits.

8. Sanitary-educational work with the population.

9. Personal hygiene as part of public hygiene.

10. Hardening of the body. The concept, value, basic principles (gradual, systematic, comprehensive, taking into account the state of health).

## Topic 29. The final lesson. Protecting of presentations (2 hours)

### III. SCHOLASTIC-METHODICAL PROVISIONING FOR THE STUDENTS' INDIVIDUAL WORK

Scholastic-methodical provisioning for the students' individual work in the discipline Hygiene presented in Supplement 1 and includes:

- schedule for performing individual work in the discipline, including the approximate time to allocate on each task;
- description of the tasks for individual work of students and methodical recommendations for their completion;
- requirements for submission and registration of results of individual work.

### IV. CONTROL FOR ATTAINING THE COURSE GOAL

№	Controlled sections/topics of the discipline	Codes and stages of forming the competences		Means for evaluation	
				Current control	Half-way attestation
1	SECTION 1 Modern hygiene and its place in medicine	PC-1 the ability and willingness to implement a set of measures aimed at the preservation and promotion of health. It includes the formation of a healthy lifestyle, the prevention of occurrence and (or) the spread of diseases, their early diagnosis, the identification of their causes, as well as this set is aimed at elimination of harmful effects of environmental factors on human health	Knows	PT-1 Test	Offset test questions 1-5 Exam questions 1-5
			Is able to	Case study	Case study
			Possesses	EP—3 Report, presentation	Case study

2	SECTION 1 Modern hygiene and its place in medicine	PC-15 the willingness to help patients and their relatives to get basic health habits, to get abilities of self-control of basic physiological features, which contribute to the prevention of diseases and health promotion	Knows	PT-1 Test	Offset test questions 6-36 Exam questions 4-17
	SECTION 2 Public health and the environment		Is able to	Case study	Case study
	SECTION 3 Nutrition and Health		Possesses	EP—3 Report, presentation	Case study
	SECTION 4 Occupational Hygiene				
	SECTION 5 Radiation hygiene				
	SECTION 6 Hospital hygiene				
	SECTION 7 Hygiene of children and adolescents				
	SECTION 8 Hygiene of inhabited places and dwellings				
	SECTION 9 Healthy lifestyle				

The model tests, methodical materials prescribing procedures for evaluation of knowledge, skills and/or practical experience, as well as criteria and indicators necessary to assess knowledge, abilities, skills and the defined stages of forming competencies in the process of acquiring educational program, are presented in Addition 2.

## V. LIST OF EDUCATIONAL LITERATURE AND INFORMATIONAL-METHODICAL REQUIREMENTS FOR THE DISCIPLINE

### Primary

1. Air Pollution and Health Effects [Electronic resource] / Srikanth S. Nadadur, John W. Hollingsworth. Springer London. 2015  
<http://link.springer.com/openurl?genre=book&isbn=978-1-4471-6669-67-8>

2. Preventive Nutrition [Electronic resource] / Adrienne Bendich, Richard J. Deckelbaum. Springer International Publishing. 2015  
<http://link.springer.com/openurl?genre=book&isbn=978-3-319-22431-2>
3. Regulatory Toxicology [Electronic resource] / Franz-Xaver Reichl, Michael Schwenk. Springer Berlin Heidelberg. 2014  
<http://link.springer.com/openurl?genre=book&isbn=978-3-642-35374-1>
4. Schools for Health and Sustainability [Electronic resource] / Venka Simovska, Patricia Mannix McNamara. Springer Netherlands. 2015  
<http://link.springer.com/openurl?genre=book&isbn=978-94-017-9171-7>
5. Wastewater [Electronic resource] / Pay Drechsel, Manzoor Qadir, Dennis Wichelns. Springer Netherlands. 2015  
<http://link.springer.com/openurl?genre=book&isbn=978-94-017-9545-6>

### **Additional**

1. Handbook of Clinical Nutrition and Aging [Electronic resource] / Connie Watkins Bales, Julie L. Locher, Edward Saltzman. Springer New York. 2015  
<http://link.springer.com/openurl?genre=book&isbn=978-1-4939-1929-1>
2. Handbook of Epidemiology [Electronic resource] / Wolfgang Ahrens, Iris Pigeot, Springer New York, 2014  
<http://link.springer.com/openurl?genre=book&isbn=978-0-387-09834-0>
3. Hospital Infection Prevention [Electronic resource] / Chand Wattal, Nancy Khardori, Springer India, 2014  
<http://link.springer.com/openurl?genre=book&isbn=978-81-322-1608-7>
4. Nelson textbook of pediatrics vol 1 / ed. by Robert M. Kliegman, Bonita F. Stanton, Joseph W. St Geme III. [Philadelphia, Pennsylvania] : Elsevier, [2016], 1756 p.  
<http://lib.dvfu.ru:8080/lib/item?id=chamo:822087&theme=FEFU>
5. Nutrition, Exercise and Epigenetics: Ageing Interventions [Electronic resource] / Byung Pal Yu. Springer International Publishing. 2015

<http://link.springer.com/openurl?genre=book&isbn=978-3-319-14830-4>

6. Functional food and health / ed. by Takayuki Shibamoto, Kazuki Kanazawa, Fereidoon Shahidi, [etc]. Washington, DC : American Chemical Society, [2008]. 514 p.

<http://lib.dvfu.ru:8080/lib/item?id=chamo:681064&theme=FEFU>

7. Vehicular Air Pollution and Urban Sustainability [Electronic resource] / Mary J. Thornbush. Springer International Publishing. 2015

<http://link.springer.com/openurl?genre=book&isbn=978-3-319-2065>

8. Well-Being, Resilience and Quality of Life from Children's Perspectives [Electronic resource] / Silvia Exenberger, Barbara Juen. Springer Netherlands. 2014

<http://link.springer.com/openurl?genre=book&isbn=978-94-007-7519-0>

### **Legislative framework:**

1. SanRaN 2.1.4.1074-01 "Drinking water. Hygienic requirements for water quality in centralized drinking water supply systems. Quality control."

2. SanRaN 2.1.4.1175-02 "Hygienic requirements for the quality of water of decentralized water supply. Sanitary protection sources."

3. SanRaN 2.1.4.1110-02 "Zones of sanitary protection of water sources and drinking water pipelines".

4. SanRaN 2.2.4.548-96. 2.2.4. Physical factors of the production environment. Hygienic requirements for the microclimate of industrial premises. Sanitary rules and norms.

5. SanRaN 2.1.2.2645-10 "Sanitary and epidemiological requirements for living conditions in residential buildings and premises"

6. MAC of pollutants in the atmospheric air of populated areas " (ГН 2.1.6.1338-03)

7. Federal Law of January 10, 2002, No. 7-FZ (as amended on December 29, 2015) “On Environmental Protection”.

[http://www.consultant.ru/document/cons\\_doc\\_LAW\\_34823/](http://www.consultant.ru/document/cons_doc_LAW_34823/)

8. Federal Law of March 30, 1999 N 52-ФЗ “On the Sanitary and Epidemiological Welfare of the Population” (as amended on December 30, 2001, January 10, June 30, 2003, August 22, 2004, May 9, December 31, 2005, December 18, 29, 30, 2006, June 26, 2007, November 8, December 1, 2007, June 12, June 14, 23, October 27, December 22, 30, 2008 September 28, December 28, 2010) <http://files.stroyinf.ru/data1/6/6000/>

9. Norms of physiological needs for energy and nutrients for various groups of the population of the Russian Federation. Methodical recommendations MP 2.3.1.2432-08

10. SanRaN 2.4.2.2821-10 "Sanitary and epidemiological requirements for the conditions and organization of training in educational institutions"

11. SanRaN 2.4.1.3049-13 “Sanitary and epidemiological requirements for the design, maintenance and organization of the mode of operation of pre-school educational institutions”

## **The list of resources of the information-telecommunication network**

### **“Internet”**

1. Primorsky Krai of Russia:

<http://www.fegi.ru/PRIMORYE/ANIMALS/bpi.htm>

2. Scientific electronic library: <http://www.elibrary.ru>

3. Central Scientific Medical Library: <http://www.scsml.rssi.ru>

4. Medical Internet Resources: <http://www.it2med.ru/mir.html>

5. Publishing House "Medicine": <http://www.medlit.ru>

6. Scientific Electronic Library: <http://elibrary.ru/>

## LIST OF INFORMATION TECHNOLOGIES AND SOFTWARE

The location of the computer equipment on which the software is installed, the number of jobs	List of licensed software
<p>Multimedia auditorium Vladivostok Russian island, Ayaks 10, building 25.1, RM. M723 Area of 80.3 m<sup>2</sup> (Room for independent work)</p>	<p>Windows Seven enterprice SP3x64 Operating System Microsoft Office Professional Plus 2010 office suite that includes software for working with various types of documents (texts, spreadsheets, databases, etc.); 7Zip 9.20 - free file archiver with a high degree of data compression; ABBYY FineReader 11 - a program for optical character recognition; Adobe Acrobat XI Pro 11.0.00 - software package for creating and viewing electronic publications in PDF; WinDjView 2.0.2 - a program for recognizing and viewing files with the same format DJV and DjVu.</p>

In order to provide special conditions for the education of persons with disabilities all buildings are equipped with ramps, elevators, lifts, specialized places equipped with toilet rooms, information and navigation support signs

### VI. METHODOLOGICAL RECOMMENDATIONS ON THE COMPLETING THE DISCIPLINE

The main goal is the formation of students' scientific outlook, preventive thinking based on hygienic and ecological knowledge, competencies in systemic fundamental knowledge, skills and abilities in matters of hygiene and human ecology, necessary for the subsequent practical activities of the doctor.

Performing by students of extracurricular individual work in extracurricular time, both under the guidance of a teacher and without his direct participation is important in order to achieve this goal.

Students are encouraged to systematically study the teaching material using textbooks, textx and methodical writings in accordance with the study plan, and to perform all task in a timely manner, which is especially important when using grade-rating system for assessing students' knowledge.



The goal of students' individual work is to master fundamental knowledge, professional skills and experiences of their specialty, experience of creative scientific research. Individual work of students promotes the development of autonomy, responsibility and organization, creative approach to solving the problems of the educational and professional level, deepen and broaden knowledge, formation of interest to cognitive activity, mastering the techniques of learning, the development of cognitive abilities.

Individual work of students for the discipline is mandatory for each student, its volume is determined by the federal educational standard and curriculum. It is necessary at the very beginning of the course to carefully plan the time allocated for individual work with the sources and literature on the subject.

Individual work includes:

- a) reading textbooks, lectures, methodical recommendations, scientific articles
- b) reading and analyzing literature passages of journalistic nature;
- c) reading and analysis of literary passages of scientific nature;
- g) working with resources posted on the Internet.

The purpose of this types of work is to instill an interest in reading and to teach students to overcome difficulties in reading, extract the necessary information from the text to teach them to use Russian and International sources for self-education and improve their professional skills.

## **LOGISTICS DISCIPLINE**

For practical work, as well as for the organization of independent work, students have access to the following laboratory equipment and specialized classrooms that meet the current sanitary and fire regulations, as well as safety requirements during training and scientific and industrial works:

<b>Name of the equipped</b>	<b>List of main equipment</b>
-----------------------------	-------------------------------

<b>rooms and rooms for independent work</b>	
The computer class of the School of biomedical AUD. M723, 15 work placts	<p>Screen, electrically 236*147 cm to trim the screen; Projector DLP technology, 3000 ANSI LM, WXGA with 1280x800 resolution, 2000:1 Mitsubishi EW330U; Subsystem of specialized mounting equipment course-2007 Tuarex; Subsystem of videocommunity: matrix switch DVI and DXP 44 DVI Pro advertising; extension cable DVI over twisted pair DVI 201 TX/RX advertising; Subsystem of audiocommentary and sound; speaker system for ceiling si 3ct LP Extron on from; digital audio processor DMP 44 LC the Extron; the extension for the controller control IPL T CR48; wireless LAN for students is provided with a system based on 802.11 a/b/g/N 2x2 MIMO(2SS) access points.</p> <p>Monoblock HP Loope 400 all-in-one 19.5 in (1600x900), core i3-4150t, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, and a DVD+ / -RW, GigEth, Wi-Fi and BT, the USB port of roses/MSE, Win7Pro (64-bit)+Win8.1Pro(64-bit), 1-1-1 Wty</p>
Multimedia audience	<p>AIO PC HP ProOne 400 G1 AiO 19.5" Intel Core i3-4130T 4GB DDR3-1600 SODIMM (1x4GB)500GB; Screen projection Projecta Elpro Electrol, 300x173 cm; Multimedia projector, Mitsubishi FD630U, 4000 ANSI Lumen 1920 x 1080; Flush interface with automatic retracting cables TLS TAM 201 Stan; Avervision CP355AF; lavalier Microphone system UHF band Sennheiser EW 122 G3 composed of a wireless microphone and receiver; Codec of videoconferencing LifeSizeExpress 220 - Codeonly - Non-AES; Network camera Multipix MP-HD718; Two 47 " LCD panels, Full HD, LG M4716CCBA; audio commutation and sound amplification Subsystem; centralized uninterruptible power supply</p>
Reading rooms of the Scientific library of the University open access Fund (building a - 10)	<p>Monoblock HP Loope 400 All-in-One 19.5 in (1600x900), Core i3-4150T, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, DVD+/-RW,GigEth,wifi,BT,usb kbd/mse,Win7Pro (64-bit)+Win8.1Pro(64-bit),1-1-1 Wty Speed Internet access 500 Mbps. Jobs for people with disabilities equipped with displays and Braille printers.; equipped with: portable reading devices flatbed texts, scanning and reading machines videovelocitly with adjustable color spectrums; increasing electronic loops and ultrasonic marker</p>
Accreditation-simulation center of the school of Biomedicine	<p>Scales, medical, floor (1 PC.)  Dynamometer Stanovoy (1 PC.)  Hand dynamometer (1 PC .)  Scales for newborns (1 PC.)  Measuring tapes (150x13 mm)  Light meter-UV-radiometer-thermohygrometer(1 EA.)</p>

**Annex 1**



THE MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION  
Federal State autonomous education institution of higher education

**TRAINING AND METHODOLOGICAL SUPPORT**

**INDEPENDENT WORK OF TRAINEES**

in discipline Hygiene  
Educational program  
Preparation for 31.05.01. General Medicine  
**Form of training full-time**

**Vladivostok**

**2017**

**The schedule execution of independent work on discipline  
« Infectious Diseases »  
(36 hours)**

<b>№</b>	<b>Date / deadlines</b>	<b>Type of independent work</b>	<b>Estimated time to complete</b>	<b>Form of control</b>
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			rules	
<b>Semester 9</b>				
	1st-6th Week	Preparing of abstract	10 h.	EP—3 Report
	7th-16th Week	Submission of presentations on the theme of the abstract	14h.	EP—3 Report, presentation
	17th-18th Week	Preparing to offset	12 h.	PT-1 colloquium
<b>Semester 10</b>				
	1st-6th Week	Preparing of abstract	18 h.	EP—3 Report
	7th-16th Week	Submission of presentations on the theme of the abstract	18 h.	EP—3 Report, presentation
	17th-18th Week	Preparing to exam	36 h.	PT-1 colloquium

### **Guidelines for writing and design of the abstract**

Abstract - the creative activity of the student, which reproduces in its structure research activities to solve theoretical and applied problems in a particular branch of scientific knowledge. By virtue of this course work is an essential component of the educational process in higher education.

The abstract, being a model of scientific research, is an independent work in which a student solves a problem of a theoretical or practical nature, applying the scientific principles and methods of a given branch of scientific knowledge. The result of this scientific search can have not only subjective, but also objective scientific novelty, and therefore can be presented for discussion by the scientific community in the form of a scientific report or a message at a scientific-practical conference, as well as a scientific article.

The abstract implies the acquisition of skills for building business cooperation based on the ethical standards of scientific activity. Purposefulness, initiative, disinterested cognitive interest, responsibility for the results of their actions, conscientiousness, competence - personality traits that characterize the

subject of research activities corresponding to the ideals and norms of modern science.

The abstract is an independent educational and research activity of the student. The teacher assists in a consultative manner and assesses the process and the results of the activity. He provides an approximate topic of abstract work, specifies the problem and topic of research with the intern, helps to plan and organize research activities, assigns time and a minimum number of consultations.

The teacher accepts the text of the abstract for verification at least ten days before the defense.

Traditionally there was a certain structure of the abstract, the main elements of which in order of their location are the following:

1. Title page.
2. The task.
3. Table of Contents
4. List of symbols, symbols and terms (if necessary).
5. Introduction.
6. The main part.
7. Conclusion.
8. Bibliographic list.
9. Applications.

The title page lists: educational institution, graduating department, author, teacher, research topic, place and year of the essay.

The title of the abstract should be as short as possible and fully consistent with its content.

The table of contents (content) reflects the names of the structural parts of the abstract and the pages on which they are located. The table of contents should be placed at the beginning of work on one page.

The presence of a detailed introduction - a mandatory requirement for the abstract. Despite the small volume of this structural part, its writing causes considerable difficulties. However, it is a qualitatively executed introduction that is the key to understanding the entire work, which testifies to the professionalism of the author.

Thus, the introduction is a very crucial part of the essay. The introduction should start with a justification of the relevance of the chosen topic. As applied to the abstract, the concept of "relevance" has one feature. From how the author of the essay can choose a topic and how correctly he understands and evaluates this topic from the point of view of modernity and social significance, characterizes his scientific maturity and professional preparedness.

In addition, in the introduction it is necessary to isolate the methodological basis of the abstract, to name the authors, whose works constituted the theoretical basis of the study. A review of the literature on the topic should show the author's thorough acquaintance with special literature, his ability to systematize sources, critically examine them, highlight the essential, determine the most important in the current state of knowledge of the topic.

The introduction reflects the importance and relevance of the chosen topic, defines the object and subject, purpose and objectives, and the chronological framework of the study.

The introduction ends with a presentation of general conclusions about the scientific and practical significance of the topic, the degree of its knowledge and sources, and the hypothesis being put forward.

The main part describes the essence of the problem, reveals the topic, determines the author's position, factual material is given as an argument and for illustrations of put forward provisions. The author must demonstrate the ability to consistently present the material while analyzing it simultaneously. Preference is given to the main facts, rather than small details.

The abstract ends with the final part, which is called "conclusion". Like any conclusion, this part of the abstract serves as a conclusion, due to the logic of the study, which is a form of synthesis accumulated in the main part of scientific information. This synthesis is a consistent, coherent presentation of the results obtained and their relation to a common goal and specific tasks set and formulated in the introduction. It is here that contains the so-called "output" knowledge, which is new in relation to the original knowledge. The conclusion may include suggestions of a practical nature, thereby increasing the value of theoretical materials.

So, in the conclusion of the abstract should be: a) presents the conclusions of the study; b) theoretical and practical significance, novelty of the abstract; c) indicated the possibility of applying the results of the study.

After the conclusion it is accepted to place the bibliographic list of the used literature. This list is one of the essential parts of the abstract and reflects the independent creative work of the author of the abstract.

The list of sources used is placed at the end of the work. It is made or in alphabetical order (by the name of the author or the name of the book), or in the order in which the references appear in the text of the written work. In all cases, the full title of the work, the names of the authors or the editor of the publication are indicated, if a group of authors participated in writing the book, data on the number of volumes, the name of the city and publisher in which the work was published, year of publication, number of pages.

#### Methodical recommendations for the preparation of presentations

For the preparation of the presentation it is recommended to use: PowerPoint, MS Word, Acrobat Reader, LaTeX-bev package. The simplest program for creating presentations is Microsoft PowerPoint. To prepare a presentation, it is necessary to process the information collected while writing the essay.

The sequence of preparation of the presentation:



1. Clearly state the purpose of the presentation.
2. Determine what the presentation format will be: live presentation (then how long it will be) or e-mail (what will be the context of the presentation).
3. Select the entire content of the presentation and build a logical chain of presentation.
4. Identify key points in the content of the text and highlight them.
5. Determine the types of visualization (pictures) to display them on slides in accordance with the logic, purpose and specificity of the material.
6. Choose the design and format the slides (the number of pictures and text, their location, color and size).
7. Check the visual perception of the presentation.

The types of visualization include illustrations, images, charts, tables. The illustration is a representation of a real-life visual. The images - as opposed to illustrations - are a metaphor. Their purpose is to cause an emotion and create an attitude towards it, to influence the audience. With the help of well-designed and presented images, information can remain permanently in a person's memory. Chart - visualization of quantitative and qualitative relationships. They are used for convincing data demonstration, for spatial thinking in addition to the logical one. Table - specific, visual and accurate data display. Its main purpose is to structure information, which sometimes facilitates the perception of data by the audience.

#### Practical tips on preparing a presentation

- printed text + slides + handouts are prepared separately;
- slides - a visual presentation of information that should contain a minimum of text, a maximum of images that carry a meaning, to look visually and simply;
  - textual content of the presentation - oral speech or reading, which should include arguments, facts, evidence and emotions;
  - recommended number of slides 17-22;

– mandatory information for the presentation: the subject, surname and initials of the speaker; message plan; brief conclusions from all that has been said; list of sources used;

– handout - should provide the same depth and coverage as the live performance: people trust more what they can carry with them than disappear images, words and slides are forgotten, and handouts remain a constant tangible reminder; handouts are important to distribute at the end of the presentation; Handouts should be different from slides, should be more informative.

### **Criteria for evaluation of the abstract.**

The stated understanding of the abstract as a holistic copyright text defines the criteria for its evaluation: the novelty of the text; the validity of the choice of source; the degree of disclosure of the essence of the issue; compliance with the requirements for registration.

The novelty of the text: a) the relevance of the research topic; b) novelty and independence in the formulation of the problem, the formulation of a new aspect of the well-known problem in the establishment of new connections (interdisciplinary, intra-subject, integration); c) the ability to work with research, critical literature, systematize and structure the material; d) the appearance of the author's position, independence of assessments and judgments; d) stylistic unity of the text, the unity of genre features.

The degree of disclosure of the essence of the question: a) the plan compliance with the topic of the abstract; b) compliance with the content of the topic and plan of the abstract; c) completeness and depth of knowledge on the topic; d) the validity of the methods and methods of working with the material; e) the ability to generalize, draw conclusions, compare different points of view on one issue (problem).

The validity of the choice of sources: a) evaluation of the used literature: whether the most famous works on the topic of research are involved (including recent journal publications, recent statistics, summaries, references, etc.).

Compliance with the requirements for registration: a) how correct the references to the used literature, references are; b) assessment of literacy and presentation culture (including spelling, punctuation, stylistic culture), knowledge of terminology; c) compliance with the requirements for the volume of the abstract.

The reviewer should clearly state the remark and questions, preferably with references to the work (possible on specific pages of the work), to research and evidence that the author did not take into account.

The reviewer can also indicate: whether the student has addressed the topic earlier (essays, written works, creative works, olympiad works, etc.) and whether there are any preliminary results; how the graduate conducted the work (plan, intermediate stages, consultation, revision and processing of the written or lack of a clear plan, rejection of the recommendations of the head).

The student submits an essay for review no later than a week before the defense. The reviewer is the teacher. Experience shows that it is advisable to acquaint the student with the review a few days before the defense. Opponents are appointed by the teacher from among the students. For an oral presentation, a student needs about 10–20 minutes (approximately as long as he answers with tickets for the exam).

Grade 5 is set if all the requirements for writing and defending an essay are fulfilled: the problem is indicated and its relevance is justified, a brief analysis of different points of view on the problem under consideration is made and one's own position is logically presented, conclusions are formulated, the topic is fully disclosed, the volume is met, external requirements are met design, given the correct answers to additional questions.

Grade 4 - the basic requirements for the abstract and its protection are met, but there are shortcomings. In particular, there are inaccuracies in the presentation of the material; there is no logical sequence in the judgments; not

sustained volume of the abstract; there are omissions in the design; Additional questions for the protection given incomplete answers.

Grade 3 - there are significant deviations from the requirements for referencing. In particular: the topic is covered only partially; factual errors in the content of the abstract or when answering additional questions; during the protection there is no output.

Grade 2 - the topic of the essay is not disclosed, a significant misunderstanding of the problem is found.

Grade 1 - student's essay is not presented.

### **Approximate topics of abstracts and presentations**

1. History of the origin of hygiene, as a science.
2. Physiological reactions and pathological manifestations of acute and chronic overheating.
3. Formation of the sanitary services in India.Characteristics of Indian climate.
4. Problems of hygiene of water in India.
5. Cholera pandemics in world history.
6. Problems of waste disposal in India.
7. Technogenic (artificial) biogeochemical provinces.
8. Problems of hygiene of atmospheric air in India.
9. Effect of lead on the health of the child.
- 10.Sick building syndrome: Definition. Factors contributing to the emergence of the syndrome. Symptoms arising from workers in the "sick building". Preventive recommendations.
- 11.Color interior design, hygienic position: The concept of color and color harmony. Color, as a factor in psycho-physiological comfort. Color as a medium. Color in the production interior.

12.3 Noise in the home: Sources of household noise. The effect of noise on the human body. Measures for the prevention of adverse effects of noise.

13. Milk and dairy products in everyday and medical nutrition: Nutritional and biological value of milk. Nutritional and biological value of dairy products (fermented milk products, cottage cheese, sour cream, cheese. Use of dairy products in clinical nutrition.

14. The value of fruits and vegetables in everyday and therapeutic nutrition: Nutritional and biological value of vegetables and fruits. Vegetables and fruits are sources of micronutrients. Vegetables and fruits - as a factor in reducing the risk of developing some chronic diseases.

15. Medicinal properties of honey: History of the use of honey in the diet. Nutritional and biological value of honey. Indications and contraindications to the use of honey in everyday and clinical nutrition.

16. Hypervitaminosis in humans: Causes of hypervitaminosis. Hypervitaminosis D and A. Hypervitaminosis C and B1. Prevention of hypervitaminosis.

17. Nutrition of persons of mental labor: Features of the functional state of the human body during mental labor. The need for energy, macro- and micronutrients in persons of mental labor. Nutrition of persons of mental labor.

18. Nutrition for the elderly. Features of the functional state of the human body in old and old age. The need for energy, macro - and micronutrients in the older age groups. Diet.

19. Toxicoinfections caused by salmonella. Etiology and pathogenesis of toxicoinfections. Clinical manifestations Prevention of toxicoinfections.

20. Staphylococcal intoxication, prevention. Etiology and pathogenesis of staphylococcal intoxication. Clinical manifestations. Staphylococcal intoxication prevention

21. Botulism. Etiology and pathogenesis of bacteriotoxicosis. Clinical manifestations of botulism. Preventive actions.

22.Mycotoxicosis. Etiology and pathogenesis of mycotoxicosis. Classification of mycotoxicosis. Clinical manifestations of the most common mycotoxicosis. Preventive actions.

23.Poisoning by products containing an admixture of chemicals. Chemical impurity classification. Poisoning by salts of heavy metals. Poisoning caused by pesticides. Preventive actions.

24.The influence of high and low temperatures of the production environment on the worker's body. The main types of human activity associated with exposure to high and low temperatures. Pathogenesis and clinical picture of overheating of the body working. Measures to prevent overheating of the human body in production. The clinical picture of hypothermia, preventive measures.

25.The microclimate of hot shops, its effect on the body. Measures to prevent overheating. Characteristics of microclimatic conditions in hot shops. Heat transfer between the body and the environment. The influence of the heating microclimate on the body of workers. Forms of overheating. Activities that prevent overheating of the body.

26.Vibration, its effect on the body. Vibration disease prevention. Production sources of vibration. The physical characteristic of vibration. Pathogenesis of vibration disease. Clinic of vibration disease. Prevention measures.

27.Noise as occupational hazards. Prevention of harmful effects of noise at work. Physical characteristics of noise, its frequency response. Pathogenesis of noise disease. Clinical manifestations of noise disease. Measures to prevent the harmful effects of noise.

28.Dust, as industrial hazard, prevention of dust pathology. The main branches of production where contact with dust is possible. Hygienic value of physico-chemical properties of dust. The effect of dust on the body. Measures for the prevention of occupational diseases.

29. Chemicals in industry, prevention of occupational poisoning. The concept of industrial poisons. The dependence of toxic effects on the chemical structure and physico-chemical properties. Ways of receipt and excretion of poisons from the body. The distribution and transformation of poisons in the body. The combined effect of poisons. Professional poisoning. Measures to prevent professional poisoning.

30. The reaction of the human body to work. Forms of labor. Physiological changes in the body at work. Fatigue and exhaustion. The main methods of studying the functional state of the body systems used in the physiology of labor.

## **Annex 2**



THE MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION  
Federal State autonomous education institution of higher education

**FUND ASSESSMENT TOOLS**

**TRAINING COMPLEX OF DISCIPLINE**

**Hygiene**

Educational program

Preparation for 31.05.01. General Medicine

**Form of training full-time**

**Vladivostok**

**2017**

**Passport of assessment fund**

Completed in accordance with the Regulations on the Funds of Evaluation Assets of Educational Programs of Higher Education - Bachelor's Programs, Specialties, FEFU Magistrates, approved by order of the Rector No. 12-13-850 of May 12, 2015.

<b>Competence code and formulation</b>	<b>Stages of forming the competence</b>
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<p>PC-1</p> <p>the ability and willingness to implement a set of measures aimed at the preservation and promotion of health. It includes the formation of a healthy lifestyle, the prevention of occurrence and (or) the spread of diseases, their early diagnosis, the identification of their causes, as well as this set is aimed at elimination of harmful effects of environmental factors on human health</p>	<p>Knows</p>	<p>the information sources of reference and regulatory nature, the main regulatory documents relating to the organization and control of the sanitary and hygienic state of various institutions;</p> <p>the environmental factors affecting human health and livelihoods; mechanisms of influence of various factors on the human body;</p> <p>the modern requirements for sanitary and hygienic and anti-epidemic regime of various medical institutions</p>
	<p>Is able to</p>	<p>work independently with educational, scientific, regulatory and reference books, to conduct a search, turn the information obtained into a means for solving professional problems;</p> <p>determine and evaluate the parameters of the microclimate of industrial premises of various medical institutions;</p> <p>carry out instrumental and computational definitions of the natural and artificial illumination of the premises;</p> <p>evaluate the effectiveness of natural and artificial ventilation of the premises;</p> <p>evaluate the quality of drinking water;</p> <p>calculate the number of bactericidal irradiators in disinfecting the air and surfaces of the premises;</p> <p>assess the energy and nutritional value of the daily human diet, taking into account the coefficient of physical activity</p>
	<p>Possesses</p>	<p>methods of planning and developing a scheme of biomedical experiments;</p> <p>methods of assessing the health and physical development of the population, assessing the functional state of the central nervous system and mental performance;</p> <p>methods of conducting specific preventive measures to examine the conditions of external factors and the working environment;</p> <p>methods of assessing the health and physical development of the population, assessing the functional state of the central nervous system and mental performance</p>
<p>PC-15</p> <p>the willingness to help patients and their relatives to get basic health habits, to get abilities of self-control of basic physiological features, which</p>	<p>Knows</p>	<p>the basics of a healthy lifestyle as a factor in his safe life activity;</p> <p>the occupational hazards and prevention of occupational pathology of a doctor;</p> <p>the basic hygiene measures of a health-improving nature, basic physiological indicators that contribute to the preservation and promotion of health, and the prevention of diseases</p>

contribute to the prevention of diseases and health promotion	Is able to	teach people basic hygiene measures improving character, self-control skills in vital signs, contributing to the preservation and promotion of health, prevention of diseases
	Possesses	methods of hygienic education and education of the population; skills of organizational and methodological work in the field of health planning
PC-16 the readiness for educational activities to eliminate the risk factors and promote healthy lifestyles	Knows	the risk factors and healthy lifestyle skills
	Is able to	carry out informational, educational and sanitary - educational work
	Possesses	education skills to eliminate risk factors and develop healthy lifestyle habits

### CONTROL FOR ATTAINING THE COURSE GOAL

№	Controlled sections/topics of the discipline	Codes and stages of forming the competences	Means for evaluation		
			Current control	Half-way attestation	
1	SECTION 1 Modern hygiene and its place in medicine	PC-1 the ability and willingness to implement a set of measures aimed at the preservation and promotion of health. It includes the formation of a healthy lifestyle, the prevention of occurrence and (or) the spread of diseases, their early diagnosis, the identification of their causes, as well as this set is aimed at elimination of harmful effects of environmental factors on human health	Knows	PT-1 Test	Offset test questions 1-5 Exam questions 1-5
			Is able to	Case study	Case study
			Possesses	EP—3 Report, presentation	Case study

2	SECTION 1 Modern hygiene and its place in medicine SECTION 2 Public health and the environment SECTION 3 Nutrition and Health SECTION 4 Occupational Hygiene SECTION 5 Radiation hygiene SECTION 6 Hospital hygiene SECTION 7 Hygiene of children and adolescents SECTION 8 Hygiene of inhabited places and dwellings SECTION 9 Healthy lifestyle	PC-15 the willingness to help patients and their relatives to get basic health habits, to get abilities of self-control of basic physiological features, which contribute to the prevention of diseases and health promotion	Knows	PT-1 Test	Offset test questions 6-36 Exam questions 4-17
	Is able to		Case study	Case study	
	Possesses		EP—3 Report, presentation	Case study	

### The scale of assessment the level of formation of competences

Code and the wording of competence	Stages of competence		Criteria	Indicators	Points
PC-1  the ability and willingness to implement a set of measures aimed at the preservation and promotion of health. It includes the formation of a healthy lifestyle, the	Knows	the information sources of reference and regulatory nature, the main regulatory documents relating to the organization and control of the sanitary and hygienic state of various institutions; the environmental factors affecting human health and livelihoods; mechanisms of influence of various factors on the human body; the modern requirements for sanitary and hygienic and anti-epidemic regime of various medical institutions	He knows the basic regulatory hygienic documents. Knows the effect of major environmental factors on the human body.	Knowledge of the regulatory framework	65-71
	Is able to	work independently with		Assessme	71-84

<p>prevention of occurrence and (or) the spread of diseases, their early diagnosis, the identification of their causes, as well as this set is aimed at elimination of harmful effects of environmental factors on human health</p>		<p>educational, scientific, regulatory and reference books, to conduct a search, turn the information obtained into a means for solving professional problems;  determine and evaluate the parameters of the microclimate of industrial premises of various medical institutions;  carry out instrumental and computational definitions of the natural and artificial illumination of the premises;  evaluate the effectiveness of natural and artificial ventilation of the premises;  evaluate the quality of drinking water;  calculate the number of bactericidal irradiators in disinfecting the air and surfaces of the premises;  assess the energy and nutritional value of the daily human diet, taking into account the coefficient of physical activity</p>	<p>Environmental Assessment Skills</p>	<p>nt of the effects of environmental factors on the human body.</p>	
	<p>Possesses</p>	<p>methods of planning and developing a scheme of biomedical experiments;  methods of assessing the health and physical development of the population, assessing the functional state of the central nervous system and mental performance;  methods of conducting specific preventive measures to examine the conditions of external factors and the working environment;  methods of assessing the health and physical development of the population, assessing the functional state of the central nervous system and mental performance</p>	<p>Possession of methods for teaching patients and their relatives basic hygiene measures of a health-improving nature, contributing to the preservation and promotion of health, and the prevention of diseases</p>	<p>Owens the methodology of conducting hygienic education of the population .</p>	<p>85-100</p>

PC-15 the willingness to help patients and their relatives to get basic health habits, to get abilities of self-control of basic physiological features, which contribute to the prevention of diseases and health promotion	Knows	the basics of a healthy lifestyle as a factor in his safe life activity; the occupational hazards and prevention of occupational pathology of a doctor; the basic hygiene measures of a health-improving nature, basic physiological indicators that contribute to the preservation and promotion of health, and the prevention of diseases	Knowledge of the basics of a healthy lifestyle	Knows the main hygienic measures of health-improving nature, contributing to the preservation and strengthening of health	65-71
	Is able to	teach people basic hygiene measures improving character, self-control skills in vital signs, contributing to the preservation and promotion of health, prevention of diseases	The ability to train patients and their relatives in basic hygiene measures of a health-improving nature.	Able to conduct preventive conversation with the population	71-84
	Possesses	methods of hygienic education and education of the population; skills of organizational and methodological work in the field of health planning	Possession of methods for teaching patients and their relatives basic hygiene measures of a health-improving nature, contributing to the preservation and promotion of health, and the prevention of diseases	Owns the methodology of conducting hygienic education of the population	85-100

PC-16 the readiness for educational activities to eliminate the risk factors and promote healthy lifestyles	Knows	the risk factors and healthy lifestyle skills	Knowledge of risk factors for disease developmen t and healthy lifestyle skills	Knows the basics of health education	65-71
	Is able to	carry out informational, educational and sanitary - educational work	Ability to conduct information al, educational and sanitary - educational work	Able to conduct educationa l activities on the eliminatio n of risk factors and the formation of skills for a healthy lifestyle	71-84
	Possesses	education skills to eliminate risk factors and develop healthy lifestyle habits	Possession of educational skills in the elimination of risk factors and the formation of skills for a healthy lifestyle	He is skilled in eliminatin g risk factors and developin g healthy lifestyle skills in specific situations.	85-100

### **Evaluation tools for intermediate certification**

#### **Offset content (6 semester)**

1. Hygiene as a science. Subject, goals and objectives of hygiene.  
Communication hygiene with other sciences.
2. The main sections of hygiene. The history of hygiene.
3. Methodology of hygiene.

4. The role of hygiene measures in solving the main tasks of the economy, ecology and health: reducing morbidity, increasing life expectancy, increasing the working capacity of the population, saving labor resources, protecting the environment.

5. Environmental factors and public health. The concept of environmentally related diseases of the population.

6. Hygienic regulation of environmental factors.

7. Methods of studying the environment and its impact on public health.

8. Hygienic characteristics of the physical factors of the air environment (temperature, humidity, air mobility, power of thermal radiation fluxes), their influence on the body's heat exchange processes with the environment, on human health and efficiency.

9. The physiological importance of air for humans. The main hygienic indicators characterizing the quality of the air environment.

10. Hygienic significance of weather and climate. Acclimatization and its hygienic value.

11. Air pollution. The main sources and air pollutants.

12. Measures to combat urban air pollution.

13. Hygienic principles of rationing of atmospheric pollution.

14. Microclimate and its hygienic value. Types of microclimate and the effect of uncomfortable microclimate on heat transfer and human health.

15. Prevention of overheating in hot microclimate conditions.

16. Prevention of hypothermia and colds.

17. Preventive measures aimed at facilitating the process of acclimatization to unfavorable conditions of the North.

18. Water hygiene. The role of water in human life. Basic hygienic requirements for drinking water.

19. The role of water in the occurrence of infectious and non-communicable diseases.

20. Hygienic requirements and standards of drinking water quality (organoleptic and microbiological indicators, chemical composition).

21. Water pollution and its hygienic value. The main sources and water pollutants.

22. Methods for improving water quality - basic and special.

23. Chemical and physical methods of water disinfection, their positive and negative properties.

24. Comparative hygienic characteristics of water sources in populated areas.

25. Sanitary protection of water bodies. Basics of water legislation.

26. The composition and properties of the soil. Geochemical, toxicological, epidemiological significance of the soil.

27. The role of soil in the occurrence and spread of disease. Hygienic regulation of exogenous chemicals in the soil.

28. Features of the formation of the environment in cities. Pollution of air, water, soil. Noise as a factor in the human environment.

29. The state of public health in modern cities.

30. The value of gardening for the formation of living conditions in the city, the rate of gardening in the residential area.

31. Hygiene of residential and public buildings. The main sources of indoor air pollution.

32. The main indicators of natural illumination (light coefficient, coefficient of natural light exposure (KEO), coefficient of penetration, angle of incidence of sunlight, hole angle), their standards for premises for various purposes.

33. The concept of artificial lighting. Types of sources of artificial electric lighting (incandescent and fluorescent lamps), their advantages and disadvantages.

34. Hygienic value of ventilation. Indicators of the effectiveness of ventilation.



35. Carbon dioxide as an integral indicator of air pollution by products of human metabolism, its rationing in various premises.

36. The definition of ultraviolet radiation, its sources. Classification of ultraviolet radiation by the nature of the biological action.

37. The value of nutrition for health, physical development and health of the population.

38. Factors determining the need of the human body for nutrients and energy.

39. Characteristics of the physiological norms of nutrition.

40. Proteins of animal and vegetable origin, their sources, hygienic value.

41. Fats of plant and animal origin, their sources, role in human nutrition.

42. Simple and complex carbohydrates, their sources, hygienic value.

43. The need, physiological value, products, sources of fat and water-soluble vitamins.

44. Definition, classification, importance of mineral substances in human nutrition.

45. Nutrition: definition, basic principles. Hygienic requirements for nutritional management of the population.

46. Prevention of diseases associated with malnutrition and excess nutrition.

47. Dietary habits of children and elderly people.

48. Excess nutrition, its role in the formation of the cardiovascular and other pathologies.

49. Food poisoning and toxicoinfections. Prevention of food poisoning.

50. Features of the organization of nutrition of persons exposed to high doses of radionuclides.

### **Questions for the exam (7 semester)**

1. Hygiene - the main preventive science. The purpose, objectives, subject and object of study. The laws of hygiene. Methods of hygienic research.

2. The main sections of hygiene. The value of hygienic knowledge in the work of a medical profile doctor. The views of the founders of domestic medicine on hygiene as the most important branch of medical knowledge.

3. The definition of "health". "Individual Health" and "Public Health". Factors shaping health. Criteria, indicators and health groups.

4. Environment as a combination of natural and social factors. Hygienic problems in ecology. The basic laws of ecology.

5. Hygienic rationing as the basis for the prevention of morbidity of the population. Principles of hygienic regulation.

6. Urbanization as an actual hygienic and environmental problem. Living conditions in large cities and their impact on public health.

7. Climate and health. Classification of climates of Russia. The use of natural climatic factors for health and healing purposes.

8. Weather. Clinical types of weather. Meteotropic diseases and their prevention.

9. The biological significance of sunlight. The use of ultraviolet and infrared rays for hygienic and therapeutic purposes.

10. Atmospheric air. Specific sources of air pollution, their impact on living conditions and public health. The main directions of air protection in cities.

11. Anthropogenic and man-made air pollutants of indoor premises, their significance. The main indicators and principles of rationing indicators of air comfort in rooms of various functional purposes, hygienic requirements for its provision.

12. Hydrosphere. Sources of pollution of the hydrosphere. Diseases of the population associated with the use of poor quality water. Prevention of waterborne epidemics.

13. Diseases associated with the characteristics of the trace element and salt composition of water. Prevention.

14. Hygienic requirements for the quality of drinking water with centralized water supply. Quality indicators. Hygienic value of chemical and bacteriological indicators.

15. Methods to improve the quality of drinking water, their comparative hygienic characteristics.

16. Ecological and hygienic value of the soil. Sources of pollution and types of soil contamination. Natural and artificial biogeochemical provinces.

17. Hygienic value of soil self-cleaning. Sanitary-chemical, microbiological indicators of soil cleanliness, their role in the development of infectious, parasitic and non-infectious diseases.

18. Hygienic value and assessment of natural lighting of hospitals. Hygienic requirements for natural lighting. Principles of rationing.

19. Sanitary - hygienic regime of hospitals. Its meaning and conditions provide it.

20. Research methods and hygienic assessment of the microclimate of treatment-and-prophylactic organizations.

21. Conditions determining the optimal heating and cooling microclimate. Changes in the body in the conditions of heating and cooling microclimate. Principles of microclimate regulation.

22. Hygienic requirements for ventilation of various hospital rooms. Types of ventilation. Methods of hygienic assessment of air in health care facilities.

23. Infections associated with the provision of medical care (ISMP), the main directions of their prevention.

24. Medical - protective regime, its value as a therapeutic factor. The conditions that provide it.

25. Hygienic requirements for the layout, design and sanitary and anti-epidemic regime of surgical and obstetric-gynecological departments of LPO.

26. Changes in the chemical and microbiological composition of the hospital air environment. Indicators of air pollution, methods of determination. Principles of rationing.

27. Hygienic requirements for the layout, design and sanitary-anti-epidemic regime of therapeutic departments.

28. Hygienic requirements for the layout, design and sanitary-anti-epidemic regime of infectious departments of hospitals and tuberculosis dispensaries.

29. Hygienic requirements for artificial lighting LPO. Methods for the study of light. Hygienic characteristics of light sources, types of lamps, lighting systems. Rationing of artificial light in rooms for various purposes.

30. Features of hygienic measures and sanitary regime in hospitals of various profiles.

31. Occupational hygiene of personnel during X-ray examination. Ensuring the safety of staff and patients.

32. Occupational health of medical personnel during radiological examinations. Ensuring safe working conditions.

33. Specific features of the labor of medical doctors. Preventive and health measures for the preservation of health and health.

34. Hygienic aspects of the work shop doctor in an industrial enterprise.

35. Occupational hygiene of surgeons and anesthesiologists. Measures to improve working conditions.

36. Occupational therapists' occupational health. Measures to improve working conditions.

37. Food poisoning. Classification. The role of the medical doctor in the investigation of cases of food poisoning.

38. Food poisoning of a microbial nature. Classification, pathogens, sources, routes of entry into products, accumulation conditions. Prevention.

39. Food poisoning of non-microbial nature. Classification, reasons. Prevention.

40. Fats, their nutritional and biological value. Hygienic value in the diet of fats. Products - sources of fat. Physiological norms for calculating the need for individual nutrition. Assessment of adequacy.

41. Nutrition as a factor of health. Hygienic basis of nutrition.

42. Norms of physiological needs for energy and nutrients for various groups of the population of the Russian Federation. Methods for assessing the adequacy of individual nutrition.

43. Food status. Indicators of food status. Types of nutritional status. Methods for assessing nutritional status.

44. Proteins, their nutritional and biological value. Hygienic value of protein in the diet. Foods, protein sources. Physiological norms, methods for calculating the need for individual nutrition. Assessment of adequacy.

45. Carbohydrates, their nutritional and biological value. Hygienic value of carbohydrates in the diet. Products - sources of carbohydrates. Physiological norms, methods for calculating the need for individual nutrition. Assessment of adequacy.

46. Hypo - and avitaminosis. The main causes of vitamin deficiency. Measures for the prevention of hypo - and vitamin deficiencies.

47. Alimentary diseases. Their classification. Hygienic aspects of the prevention of nutritional diseases.

48. Minerals / macro - and micronutrients /, their role in human nutrition. Principles of rationing. Sources of intake. Prevention of microelementoses.

49. Excess nutrition, its role in the development of various forms of pathology.

50. Malnutrition, its role in the development of various forms of pathology.

51. Hygienic principles of therapeutic and preventive nutrition and its importance in the prevention of occupational diseases.

52. Catering in health care organizations. Medical control over the quality of nutrition in LPO.

53. Medical nutrition. Notion Principles of therapeutic nutrition.
54. The nutritional habits of certain groups of the population: the elderly, who are predominantly engaged in mental and physical labor. Orientation of rations, peculiarities of nutritional composition and requirements for products and dishes.
55. Methods for assessing the physical development of children and adolescents, their comparative hygienic characteristics.
56. The purpose of studying the physical development of children and adolescents. Factors affecting physical development. Patterns of growth and development of children and adolescents.
57. Methods of studying and studying the physical development of children and adolescents.
58. Actual problems of hygiene of children and adolescents. The health of the younger generation.
59. Industrial poisons, their classification. Research methods and hygienic evaluation.
60. General characteristics of the action of industrial poisons. Prevention of acute and chronic intoxication in the workplace.
61. Methods for assessing the functional state of the human body in the process.
62. The main directions of recreational activities in the workplace.
63. Hygienic characteristics of industrial dust. Disease etiology prevention.
64. Noise as occupational hazard. Diseases associated with industrial noise, measures for their prevention.
65. The severity and intensity of work, the definition of concepts. The classification of labor by severity and tension.
66. Production radiation, their classification and hygienic characteristics.
67. Vibration as a professional factor. Vibration disease and its prevention.
68. Industrial carcinogens, prevention of occupational cancer.

69. Comprehensive assessment of working conditions by hazard and hazard classes.

70. The concept of occupational hazards and occupational diseases. Classification of occupational diseases.

71. Cellular communications and health.

**Scoring criteria on the student competition on the subject  
«Gygiene»**

<b>Points (rating)</b>	<b>Evaluation offset/exam (standard)</b>	<b>Requirements to the formed competences</b>
86-100	<i>«credited»/ «excellent»</i>	The rating of «excellent» to the students, if it is deeply and firmly mastered the program material, comprehensively, consistently, accurately and logically sound it sets, can be closely linked theory with practice, freely to cope with questions and other types of application knowledge is not difficult to answer at modification jobs has versatile skills and techniques perform practical tasks.
76-85	<i>«credited»/ «good»</i>	The rating of «good» to the students, if he knows for sure the material correctly and essentially sets out its not allowing significant inaccuracies in answering the question correctly applies the theoretical principles in solving practical issues and challenges, has the necessary skills and techniques for their implementation.
51-75	<i>«credited»/ «satisfactory»</i>	The rating of «satisfactory» to the students, if he has knowledge of only the base material, but did not learn his parts, admits inaccuracies, insufficient correct wording violations of logical consistency in the presentation of program material, has difficulty in carrying out practical work.
Less 50	<i>«fail»/ «unsatisfactory»</i>	The rating of «unsatisfactory» to the students, who did not know a large part of the program material, allows substantial errors, uncertainly, with great difficulty performing practical work.

## Typical estimates of funds for the current certification

### Test papers

#### 1. Purest water in nature is:

- (a) River water
- (b) Rain water
- (c) Deep well
- (d) Impounding reservoirs

#### 2. All the following statements are true about break point chlorination, except:

- (a) Free chlorine is released in water after break point chlorination
- (b) Chlorine demand is the amount needed to kill bacteria, oxidize organic matter and neutralize ammonia
- (c) 1 ppm free chlorine should be present in water after break point has reached
- (d) Contact period of 1 hour is necessary

#### 3. Nitrates in excess of—may cause infantile methaemoglobinaemia:

- (a) 15 mg/l
- (b) 25 mg/l
- (c) 35 mg/l
- (d) 45 mg/l

#### 4. All the following provide evidence of faecal pollution except:

- (a) Faecal streptococci
- (b) Coliform
- (c) Cl. Tetani
- (d) Enterpathogenic virus

#### 5. Per capita allowance of water per day is recommended at:

- (a) 70-80 lit
- (b) 80-120 lit
- (c) 120-150 lit
- (d) 150-200 lit

#### 6. Recommended standard for bacterial water quality in small community supplies is:

- (a) No coliform [
- (b) No E coli in 100 ml
- (c) Coliform less than 10/100 ml
- (d) Coliform less than 1/100 ml

#### 7. Temporary hardness of water is primarily due to the presence of:

- (a) Calcium and magnesium sulphates
- (b) Calcium and magnesium chlorides
- (c) Calcium and magnesium bicarbonates



(d) Calcium and magnesium nitrates

**8. Horrock's apparatus estimates:**

(a) Free chlorine

(b) Combined chlorine

(c) (a) + (b)

(d) Chlorine demand

**9. Which one of the following methods is used for the estimation of chlorine demand of water?**

(a) Chlorometer

(b) Horrock's apparatus

(c) Berkefeld filter

(d) Double pot method

**10. Ortho-toulidine test is used to determine:**

(a) Nitrates in water

(b) Nitrites in water

(c) Free and combined chlorine in water

(d) Ammonia content in water

**11. Most desired temperature range for drinking water is:**

(a) 0-5°C

(b) 5-10°C

(c) 10-15°C

(d) 15-20°C

**12. Most undesirable metal in drinking water is:**

(a) Iron

(b) Copper

(c) Zinc

(d) Lead

**13. 'Most reliable' evidence of fecal contamination of water is provided by:**

(a) Coliform bacteria

(b) *Cl. Perfringens*

(c) *St. fecalis*

(d) *Cl. welchii*

**14. Scabies, an infection of the skin caused by *Sarcoptes scabiei*, is an example of:**

(a) Water borne disease

(b) Water washed disease

(c) Water based disease

(d) Water related disease

**15. "Safe and Wholesome water" does not include being:**

(a) Free from pathogenic agents

(b) Free from harmful chemical substances

(c) Free from colour and odour

(d) Free from chlorine

**16. A daily water supply considered adequate to meet the need for all urban domestic purposes is:**

- (a) 10 litres per capita
- (b) 20 litres per capita
- (c) 40-60 litres per capita
- (d) 150-200 litres per capita

**17. All are “Water-Washed Diseases” except:**

- (a) Scabies
- (b) Trachoma
- (c) Typhoid
- (d) Conjunctivitis

**18. All are true for Rapid Sand Filters except:**

- (a) No preliminary storage of raw water is required
- (b) Operation requires highly skilled persons
- (c) Frequent washing is not required
- (d) Can be gravity type or pressure type

**19. Disinfecting action of chlorine on water is mainly due to:**

- (a) Hydrogen chloride [
- (b) Hypochlorous acid
- (c) Hypochlorite ions
- (d) Hydrogen ions

**20. Which of the following agents have ‘residual germicidal effect’ when used for disinfection of water:**

- (a) Chlorine only
- (b) Chlorine and Ozone gas
- (c) Chlorine and UV radiation
- (d) Chlorine, Ozone gas and UV radiation

**21. Proposed guideline values for Radioactivity in Drinking water is:**

- (a) Gross a activity 0.1 Bq/L and Gross b activity 1.0 Bq/L
- (b) Gross a activity 1.0 Bq/L and Gross b activity 0.1 Bq/L
- (c) Gross a activity 1.0 Bq/L and Gross b activity 10.0 Bq/L
- (d) Gross a activity 10 Bq/L and Gross b activity 1.0 Bq/L

**22. MPN Multiple Tube Method is done to:**

- (a) Detect the presence of Coliform organisms in a sample of water
- (b) Detect the presence of Faecal streptococci in a sample of water
- (c) Detect the presence of *Cl. perfringens* in a sample of water
- (d) Do the colony count of bacteria

**23. Level of hardness in soft water is \_\_\_ mEq/liter:**

- (a) Less than 1
- (b) 1-3
- (c) 3-6
- (d) Over 6

**24. To find out the dose of bleaching powder required for disinfection of water, following is used:**

- (a) Chloroscope
- (b) Chloronome
- (c) Horrock's apparatus
- (d) Winchester Quart Bottle

**25. Indicator solution in Horrock's Apparatus contains:**

- (a) Ortho-toulidine
- (b) Starch iodide
- (c) Ortho-toulidine arsenite
- (d) Bromocresol purple

**26. The minimum recommended dose of "free" residual chlorine in water for routine chlorination (in mg/ lts) is:**

- (a) 0.5 mg/l for a contact period of 1hr
- (b) 0.5 mg/l for a contact period of 1/2 hr
- (c) 1.0 mg/l for a contact period of 1hr
- (d) 1.0 mg/l for a contact period of 1/2 hr

**27. For an adult Indian male the daily requirement of protein is expressed as:**

- (a) 0.5 g/kg body weight
- (b) 0.75 g/kg body weight
- (c) 1 gm/kg body weight
- (d) 1.50 g/kg body weight

**28. In 13-15 year female child, recommended daily protein intake (gm/kg/day) is:**

- (a) 0.68
- (b) 0.95
- (c) 1
- (d) 1.33

**29. Energy requirement in late pregnancy for a moderate worker is:**

- (a) 2500 cal
- (b) 1400 cal
- (c) 1000 cal
- (d) 500 cal

**30. Indian reference man:**

- (a) 55 kg
- (b) 60 kg
- (c) 65 kg
- (d) 70 kg

**31. Reference weight of Indian men and women is:**

- (a) 60 and 50 kg
- (b) 55 and 50 kg
- (c) 65 and 55 kg

(d) 45 and 50 kg

**32. Extra calories per day in lactating mothers in first six months:**

(a) 300

(b) 500

(c) 600

(d) 1000

**33. The daily extra caloric requirement in first trimester of pregnancy is:**

(a) 50

(b) 150

(c) 350

(d) 450

**34. Which of the following trace element cannot be completely supplemented by diet during pregnancy:**

(a) Fe

(b) Ca<sup>++</sup>

(c) Zn

(d) Mn

**35. Additional calories regarding for lactation:**

(a) 550

(b) 440

(c) 300

(d) 130

**36. True statement regarding RNTCP includes all except:**

(a) Sputum microscopy

(b) Exclusion of private practitioners

(c) Participation of all health workers

(d) Provide latest equipments

**37. Energy requirement of a sedentary female is:**

(a) 2200-2400 Kcal

(b) 2400-2800 Kcal

(c) >2800 Kcal

(d) <2000 Kcal

**38. Indian reference man weighs:**

(a) 60 kg

(b) 70 kg

(c) 40 kg

(d) 50 kg

**39. According to ICMR the 'Cereals and pulses' requirement for a sedentary strict vegetarian male is?**

(a) 200 and 50 grams

(b) 300 and 60 grams

(c) 460 and 40 grams

(d) 560 and 50 grams

**40. Calories required for 0-6 m infant is (Kcal/kg):**

- (a) 150
- (b) 100
- (c) 300
- (d) 400

**41. Energy requirement in early lactation is:**

- (a) 550 Kcal
- (b) 300 Kcal
- (c) 400 Kcal
- (d) 850 Kcal

**42. Pulse protein is deficient in which of the following Essential Amino Acid?**

- (a) Lysine
- (b) Methionine
- (c) Threonine
- (d) Tryptophan

**43. All are true about Net protein utilization (NPU) except:**

- (a) Defined as Nitrogen retained by Nitrogen consumed X 100
- (b) Good for estimating protein quality
- (c) Egg has the highest NPU value
- (d) 1 gram protein is equivalent to 1 gram Nitrogen

**44. What is known as “poor man’s meat”?**

- (a) Milk
- (b) Pulses
- (c) Fish
- (d) Egg

**45. Semi essential amino acids are:**

- (a) Tryptophan, Tyrosine
- (b) Leucine, Lysine
- (c) Histidine, Arginine
- (d) Phenylalanine, Valine

**46. Lysine is deficient in:**

- (a) Pulse
- (b) Wheat
- (c) Both of the above
- (d) None of the above

**47. Biological value is maximum of:**

- (a) Egg
- (b) Milk
- (c) Soyabean
- (d) Pulses

**48. Pulses are deficient in:**

- (a) Lysine and threonine

- (b) Lysine and tryptophan
- (c) *Methionine and cysteine*
- (d) Lysine and methionine

**49. Pulse proteins are poor in:**

- (a) *Methionine*
- (b) Lysine
- (c) Threonine
- (d) Alanine

**50. The protein quality indicator adopted by ICMR in recommending dietary protein requirement is:**

- (a) *Amino acid score*
- (b) Net protein utilization
- (c) Biological value
- (d) Protein efficiency ratio

**51. Among the pulses, the highest quantity of protein is present in:**

- (a) Green gram
- (b) Red gram
- (c) *Soyabean*
- (d) Black gram

**52. Which of the following has highest protein content:**

- (a) Mutton
- (b) *Soyabean*
- (c) Egg
- (d) Milk

**53. Lysine is deficient in:**

- (a) Pulse
- (b) *Wheat*
- (c) Both
- (d) None

**54. Amino acid lesser in rice is:**

- (a) *Lysine*
- (b) Methionine
- (c) Both
- (d) None

**55. Biological value is maximum of:**

- (a) *Egg*
- (b) Milk
- (c) Soyabean
- (d) Pulses

**56. Net protein utilization is highest in:**

- (a) *Egg*
- (b) Wheat

- (c) Milk
- (d) Fish

**57. The protein quality indicator adopted by ICMR in recommending dietary protein requirements is:**

- (a) Amino acid score
- (b) *Net protein utilization*
- (c) Biological value
- (d) Protein efficiency ratio

**58. Highest content of protein is found in:**

- (a) *Soya bean*
- (b) Red gram
- (c) Bengal gram
- (d) Black gram

**59. The limiting amino acid in the wheat is:**

- (a) Leucine
- (b) *Lysine*
- (c) Methionine
- (d) Tryptophan

**60. The limiting amino acids in wheat is:**

- (a) *Lysine and threonine*
- (b) Lysine and tryptophan
- (c) Lysine and Leucine
- (d) Tyrosine and tryptophan

**61. The limiting amino acid in wheat is:**

- (a) Alanine & threonine
- (b) *Lysine & threonine*
- (c) Alanine
- (d) Tyrosine & Methionine

**62. Protein content is highest in:**

- (a) Bengal gram
- (b) Lentils
- (c) Pulses
- (d) *Soyabean*

**63. Reference protein is:**

- (a) Milk
- (b) Meat
- (c) *Egg*
- (d) Pulses

**64. Maize is deficient in:**

- (a) Methionine
- (b) *Lysine*
- (c) Leucine
- (d) All

**65. Daily requirement of protein is:**

- (a) *1 g/kg body weight*
- (b) *1.2 g/kg body weight*
- (c) *0.9 g/kg body weight*
- (d) *1.5 g/kg body weight*

**66. Which method of assessment of quality of proteins gives more complete assessment of protein quality?**

- (a) *Biological value*
- (b) *Net protein utilization*
- (c) *Digestibility co-efficient*
- (d) *Amino acid score*

**67. Biological value of Rice protein is:**

- (a) *52*
- (b) *67*
- (c) *80*
- (d) *100*

**68. Reference protein is:**

- (a) *Egg*
- (b) *Milk*
- (c) *Pulses*
- (d) *Fish*

**69. Which is known as reference protein?**

- (a) *Soyabean*
- (b) *Milk*
- (c) *Orange*
- (d) *Potato*

**70. Psychrometer is used to measure:**

- (a) *Humidity*
- (b) *Air velocity*
- (c) *Room temperature*
- (d) *Radiant heat*

**71. McArdle's maximum allowable sweat rate is:**

- (a) *4 lit /4 hours*
- (b) *4 lit /1 hours*
- (c) *4.5 lit/4 hours*
- (d) *4.5 lit/8 hours*

**72. Kata thermometer measures:**

- (a) *Air temperature only*
- (b) *Air temperature and humidity*
- (c) *Air temperature, humidity and air movement*
- (d) *Air velocity only*

**73. 'Cooling Power' of air is measured by:**

- (a) *Kata thermometer*



- (b) Hygrometer
- (c) Anemometer
- (d) Sling's Psychrometer

**74. Kata thermometer measures:**

- (a) Air temperature only
- (b) Air temperature and humidity
- (c) *Air temperature humidity and air movement*
- (d) None of the above

**75. The mean radiant temperature is measured by:**

- (a) Dry bulb thermometer
- (b) Wet bulb thermometer
- (c) Six's maximum and minimum thermometer
- (d) *Globe thermometer*

**76. The instrument used for recording very low air velocities is:**

- (a) Globe thermometer
- (b) *Kata thermometer*
- (c) Anaemometer
- (d) Sling psychrometer

### **Evaluation tools for the current attestation**

**Control tests** are designed for the students studying the course "Hygiene".

The tests are necessary for the control of knowledge during the current interim attestation, and for the evaluation of knowledge and thus to get credit for course.

While working with tests the student are asked to select one answer from the three - four proposed. At the same time the tests are not identical in their complexity.

Offered tests contain several variants of correct answers. The student must select all the correct answers.

The tests are designed both for individual and collective solving them. They can be used in the process both classroom lessons and independent work. The tests, required for the control of knowledge, are chosen in the process of the intermediate certification by each teacher individually.

The results of the test tasks are evaluated by a teacher on a five-mark grading scale or system of "**credit**" - "**not credit**".

Evaluation of "**excellent**" is got by student at the correct answer to more than 90% of the proposed tests.

Evaluation of "**good**" getting - at the correct answer by more than 70% of tests.

Evaluation of "**satisfactory**" - at the correct answer to 50% of the offered tests.

### **Examples of Case studies**

1. In the area of the proposed construction of a waste incineration plant, the frequency (repeatability) of the winds was determined. The following results were obtained: N - 30%, NE - 20%, E - 5%, SE - 5%, S - 5%, SW - 15%, W - 10%, NW - 10%. You need to give the definition of the wind rose, to build a rose of winds and to indicate the prevailing wind direction in the area. Where should the company be located in relation to the residential area?

2. The Coefficient of natural lighting in the Classroom is 150 Lx, the Light factor is 1: 4. You should estimate a natural lighting.

3. In the foundry in the warm season the air temperature is 30 C, the air humidity is 20%, the air velocity is 0.1 m / s. You should to assess the microclimate in the foundry.

4. According to the study of atmospheric air in the residential zone of the city N, the average daily concentrations of substances in the air were: NO<sub>2</sub> (азота диоксид) – 0,02 mg / м<sup>3</sup>, NH<sub>3</sub> (аммиак) – 0,01 mg / м<sup>3</sup>, Hg (ртуть) – 0,00001 mg / м<sup>3</sup>, CO (углерод оксид) – 2 mg / м<sup>3</sup>, formaldehyde (формальдегид) – 0,0001 mg / м<sup>3</sup>, tetraethyl lead (тетраэтилсвинец) – 0,00001 mg / м<sup>3</sup>, dust (пыль (неорганическая, с содержанием двуокиси кремния менее 20%)) – 0,9 mg / м<sup>3</sup>. You should estimate a hygienic state of atmospheric air.

