

SYLLABUS

1. General information on the course

Full course name	Hygiene and Ecology
Full official name of higher educational institution	Sumy State University
Full name of a structural unit	Medical Institute. Department of Public Health
Author(s)	Yasenok Viktoriia Oleksandrivna, Smiianov Vladyslav Anatalyovich
Cycle/higher educational level	The Second Level Of Higher Education, National Qualifications Framework Of Ukraine – The 7th Level, QF-LLL – The 7th Level, FQ-EHEA – The Second Cycle
Semester	15 weeks during the 4 th semester
Workload	The volume is 3 credits, 90 hours, of which 50 hours is contact work with the teacher (20 hours of lectures, 30 hours of practical classes)
Language(s)	English

2. Place in the study programme

Realtion to curriculum	Compulsory course available for study programme "Medicine"
Prerequisites	Medical Biology, Biochemistry, Biophysics, Physiology
Additional requirements	There are no specific requirements
Restrictions	There are no specific restrictions

3. Aims of the course

To provide training of highly qualified medical specialists capable of solving complex problems and tasks in the field of disease prevention.

4. Contents

Topic 1 The science of hygiene, its purpose, tasks, content, methods of hygienic research.

Hygiene as a science, methodology of hygiene study, methods of hygienic research. Preventive specification of Ukrainian medicine, public and personal, primary, secondary and tertiary prevention, determining priorities. The importance of hygiene knowledge for the formation of professional thinking and practical activities in doctors of different specialties. The concept of methodology as a doctrine of scientific knowledge of reality. Basics of hygiene methodology: general philosophical laws and categories, their implementation in hygiene. Theoretical basis of hygiene, its essence, the contribution of the most significant scientists-hygienists for their scientific justification, interpretation and practical use. Methods of hygienic research, their classification. Methods for studying the state of the environment. The concept of hygienic standards and principles of hygienic normalization. Sanitation as an industry of practical health care activity. Varieties of sanitation. State sanitary supervision, its essence. Basics of sanitary legislation, most important elements and importance for the implementation of preventive measures. Origin, main stages of development and current state of hygiene. Contribution of outstanding Ukrainian scientists to the development of hygienic science.

Topic 2 Hygienic value of solar radiation and components of the biosphere (atmosphere, lithosphere, hydrosphere)

Solar spectrum, solar activity, "solar wind". Interaction of solar radiation with magnetosphere and atmosphere of the Earth. Ozone layer and ozone holes. Effect of solar activity on biosphere, human body and public health. Hygienic value of infrared, ultraviolet (UV) and visible sun radiation, their effect on human body and population health. Use of UV in medicine, artificial sources of UV, determination of erythema, physiological and prophylactic dose of UV, prevention of harmful effects. Biosphere and its components. Teachings of V.I. Vernadsky on the noosphere. Weather and factors that characterize and form it. Types of atmosphere circulation: anticyclones, cyclones, atmospheric fronts. Medical classification of weather. Heliometetropic reactions in healthy and sick person and their prevention. Weather impact on air pollution. Climate: factors that form and characterize it, classifications, effects on health and performance. Prevention of the negative effects of climatic conditions on health; acclimatization and its phases. Atmospheric air: natural composition, hygienic value of its components, sources of pollution, methods of determination and hygienic normalization of exogenous substances. Microclimate of premises: basic indicators and methods of their measurement, impact on physiological functions and health, hygienic normalization. Methods of studying the complex effects of microclimate on the human body

Topic 3 Hygiene of settlements

Living conditions in settlements and human health. Features of formation of urban environment and hygienic aspects of life in modern cities. Urbanization as a social and hygienic problem. Planning and development of the territory of settlement. Principles of functional zoning of the territory of settlements, placement of residential, industrial, warehouse and recreational areas. Hygienic value of green spaces in settlements. Water as a fact of environment. Physiological and hygienic value of water. Norms of water consumption and using. Hygienic requirements for the quality of water sources of economic and drinking water supply. Classification of water improvement methods in centralized water supply system: lighting and discoloration, mitigation, disinfection, desalination, degassing, deactivation, fluoridation and defloration. Indicators of the effectiveness of water disinfection at water supply stations. Quality indicators of drinking water (its organoleptic properties, chemical composition, epidemiological and radiation safety). Water as an etiological factor in the acquisition of non-infectious hazards. Endemic fluorosis, caries; their prevention. Hygienic value of the soil. Indicators and scale of assessment of the sanitary condition of the soil. Hygienic characteristics of methods of gathering, removal and disposal of liquid and solid wastes.

Topic 4 Basics of rational nutrition

Human nutritional status: the concept and methods of its definition. Indicators of protein, fat and carbohydrate adequacy of human nutritional status. Signs and indicators of providing the body with macro- and microelements and vitamins. Classification of food status. Concept, principles and conditions of rational nutrition. Physiological significance and basic functions of food. Classification of nutrients and their functions in the body (plastic, energy, catalytic, protective). Basics of building a healthy person's diet. Determination of human energy consumption (direct and indirect calorimetry, alimentary ergometry, pulsometry, calculated methods). Determination of human needs in nutrients. Features of nutrition of people of different age groups and professional groups, athletes, patients in hospitals.

Topic 5 Prevention of food poisonings

Food products and their hygienic characteristics and classification. State and hygienic standards of food products, certificates of quality in market products. Causes and signs of food spoilage (meat and meat products, milk and dairy products, grain, flour and bakery products, canned food, vegetables). Terms of food storage and terms of sale. Rules of cooking processing of food products in order to preserve their benignity, vitamins, prevent from diseases of the digestive system. Nutritional supplements, their purpose and hygienic characteristics. Food poisoning, their definition and classification. Nutritional toxicoinfections: definition, etiology, diagnosis, clinical symptoms, prevention principles. Bacterial toxicosis (botulism, staphylococcal toxicosis): etiology, diagnosis, clinical symptoms, prevention principles. Mycotoxicoses are caused by aflatoxins, ochratoxins and other mycotoxins, etiology, diagnosis, clinical symptoms, prevention principles. Food poisoning of non-infectious and unidentified nature. Investigation of food poisoning: purpose, procedure, responsible executives. Preventive measures to eliminate and prevent food poisoning.

5. Intended learning outcomes of the course

After successful study of the course student will be able to:

LO1	Ability to determine the necessary mode of diet in the course of prevention of alimentary-dependent and alimentary-based diseases.
LO2	Ability to assess the influence of environment determinants on the health of a person, family, or population.
LO3	On the basis of data on the connection the state of the environment and the health of a certain group of population to develop and carry out preventive measures for infectious and non-infectious diseases.

6. Role of the course in achievement of programme learning outcomes

Programme learning outcomes achieved by the course.

For 222 Medicine:

PO7	To determine an appropriate work and rest mode in the treatment of diseases (according to the List 2) at a healthcare institution, at patient's home and during medical evacuation (including in the field), based on the provisional clinical diagnosis and observing the relevant ethical and legal norms, by making a reasonable decision according to existing algorithms and standard procedures.
PO8	To determine an appropriate diet in the treatment of diseases (according to the List 2) at a healthcare institution, at patient's home and during medical evacuation (including in the field), based on the provisional clinical diagnosis and observing the relevant ethical and legal norms, by making a reasonable decision according to existing algorithms and standard procedures.
PO16	To plan and implement a system of sanitary and preventive measures against the occurrence and spread of diseases among the population.
PO19	To assess environmental impact on public health.
PO21	To organize an appropriate level of individual safety (own and of those cared for) in case of typical dangerous situations in the individual field of activity.

7. Teaching and learning activities

7.1 Types of training

Topic 1 The science of hygiene, its purpose, tasks, content, methods of hygienic research.

Lect.1 "Hygiene and ecology as a science. Hygienic value of solar radiation"(Full-time)

The lecture highlights the purpose, object and subject study of hygiene and ecology, the main tasks and methods, the basic laws of hygiene, principles hygienic regulation. Students assimilate the hygienic normalization of the physical factors of the biosphere.

Pr.tr.1 "Introduction to the hygiene" (Full-time)

Students get acquainted with the department, its history, directions of scientific activity, procedure for registration of protocols, educational manuals, regulations for assessing knowledge, safety during hygiene and ecology classes; master knowledge of hygiene as a scientific discipline and sanitation, their purpose, tasks, components, importance for doctors of different profiles; assimilate the classification of hygienic methods of research and its effects on the body and health. Practical work: students compare subjects and objects of study of therapeutic and preventive medicine (hygiene), their goals, tasks and methods and enter this data in the special table.

Topic 2 Hygienic value of solar radiation and components of the biosphere (atmosphere, lithosphere, hydrosphere)

Lect.1 "Hygiene and ecology as a science. Hygienic value of solar radiation"(Full-time)

The lecture highlights the interaction of sunlight with biosphere, biological action of infrared, visible and ultraviolet radiation.

Lect.2 "Hygienic normalization in meteorology and climatology" (Full-time)

The lecture highlights the impact of meteorological and climatological factors on human health, the essence, mechanisms and stages of acclimatization, the basics of the prevention of meteoropathological conditions.

Lect.3 "Hygienic problems of urbanization" (Full-time)

Problems of pollution of atmospheric air, soil, reservoirs of settlements and noise burden in urban conditions, peculiarities of urban climate, main measures for protection of urban environment (planning, organizational, technical and sanitary-technical) are considered. Issues of living environment organization are regarded (microclimate, air quality and ventilation, illumination, noise, electromagnetic radiation, etc.)

Pr.tr.2 "Method of determining the intensity and prophylactic dose of ultraviolet radiation. Methods of using ultraviolet radiation to prevent diseases and provide air sanitation"(Full-time)

Students learn the physical and biological properties of ultraviolet radiation, master the methods of measuring its intensity; assimilate the order of ultraviolet irradiation of people for preventive purposes, the order of ultraviolet air rehabilitation and evaluation of its effectiveness. Practical work: according to the determination of erythema dose by biodesimeter, students determine the physiological and prophylactic dose of UV radiation; calculate at what distance from the irradiator a group of children should be located to obtain a preventive dose; inoculate air on petrie dishes with a special medium using the Croto apparatus; according to the results of air inoculation on petrie dishes students calculate the effectiveness of ultraviolet air sanitation.

Pr.tr.3 "Methods of hygienic evaluation of natural and artificial lighting" (Full-time)

Students learn the hygienic requirements for natural and artificial lighting of various rooms, indicators and methods for determining natural and artificial lighting, the consequences of adverse effects of insufficient and excessive lighting on people's health. Practical work: using geometric and lighting methods, students measure the parameters of natural and artificial lighting of the classroom and provide a hygienic assessment of the quality of lighting.

Pr.tr.4 "Methods of determination and hygienic evaluation of temperature and humidity conditions of premises, direction and speed of air movement and complex influence of microclimate parameters on human heat exchange"

Students define the concepts of "microclimate" and "thermal comfort" and the factors that form them, assimilate the physiological mechanisms of heat exchange and heat regulation, chemical mechanisms of heat production, physiological changes in the human body that occur when exposed to the heating and cooling microclimate. Practical work: 1) students measure room temperature, relative humidity and air speed using special devices; 2) solve situational problems for hygienic evaluation of microclimate parameters in different rooms; 3) carry out hygienic assessment of the complex impact of microclimate parameters on human heat exchange

Pr.tr.5 "Method of determination and hygienic evaluation of parameters of premises microclimate and their complex impact on human heat exchange" (Full-time)

Students acquire knowledge about the microclimate of premises, factors that form it, physiological changes in thermoregulation mechanisms and adverse effects in heating and cooling microclimate. Practical work: students measure the temperature in the classroom, as well as humidity, atmospheric pressure, air speed and give them a hygienic assessment; according to situational problems determine effectively-equivalent and resulting temperature; according to the annual repeatability of winds in the settlement build a "wind rose" and predict air pollution in the territory of the settlement.

Pr.tr.6 "Method of determination of carbon dioxide concentration and air oxidation as indicators of anthropogenic air pollution and ventilation quality of premises" (Full-time)

Students study the composition of atmospheric and exhaled air; sources, criteria, indicators of chemical pollution of air and air of residential, public, industrial premises; exposure to polluted air on human health; classification of air sampling methods for sanitary and chemical research; a fundamental scheme of the aspiration method for sampling air for chemical analysis, devices and means used; classification of ventilation systems and hygienic indices of ventilation efficiency. Practical work: 1) according to the situational problem, students calculate the volume of air required for chemical analysis and bring it to normal conditions; 2) according to situational tasks, students determine the indices of air exchange and ventilation of premises and give them a hygienic assessment.

Topic 3 Hygiene of settlements

Lect.3 "Hygienic problems of urbanization" (Full-time)

Problems of pollution of atmospheric air, soil, reservoirs of settlements and noise burden in urban conditions, peculiarities of urban climate, main measures for protection of urban environment (planning, organizational, technical and sanitary-technical) are considered. Issues of living environment organization are covered (microclimate, air quality and ventilation, illumination, noise, electromagnetic radiation, etc.)

Lect.4 "Water as a health factor" (Full-time)

The lecture considers issues of hygienic, physiological, epidemiological and economic importance of water; influence of the chemical composition of natural waters on the conditions of water supply and public health; influence of contaminated water on the conditions of water use and public health, issues of hygienic regulation of drinking water quality, hygienic characteristics of water supply conditions and cleaning of settlements

Pr.tr.7 "Methods of hygienic survey of water supply sources" (Full-time)

Students get the knowledge on the hygienic importance of water; classification of water sources, conditions of water formation and their comparative characteristics; areas of sanitary protection of water supply sources; self-cleaning processes of open reservoirs and self-cleaning indicators; absorb the classification of water quality improvement methods (lighting, discoloration, coagulation, upholstery, filtration, disinfection, desalination, softening, disinfection, fluoridation, defloration, degassing, deactivation); Practical work: 1) according to situational tasks, students determine the productivity of water supply sources 2) according to laboratory study of water from the water source provide a hygienic assessment of its quality.

Pr.tr.8 "Methods of hygienic assessment of drinking water according to the data of sanitary inspection of water supply systems and the results of laboratory analysis of samples" (Full-time)

Students learn hygienic indicators and quality standards of drinking water, peculiarities of centralized and decentralized water supply systems of settlements; standards of drinking water consumption and their justification; diseases of infectious and non-infectious origin, caused by the use of poor quality water, and means of their prevention; ways to improve water quality and technical means of their implementation; the scope of measures for sanitary supervision for the operation of the main water supply facilities, as well as wells and hoods. Practical work: according to the laboratory study of water samples, students make a sanitary and hygienic conclusion.

Pr.tr.9 "Methods of hygienic assessment of soil according to the data of the sanitary survey of the land plot and the results of laboratory analysis of samples" (Full-time)

Students learn about the hygienic, endemic and epidemiological significance of the soil; basic physical properties of the soil (mechanical composition, humidity, porosity, water permeability, filtration ability, air permeability, capillarity, moisture capacity) and their hygienic value; the main abiotic components of the soil and their significance; soil biocenoses, their classification and characteristics; infectious and non-infectious diseases associated with the soil; hygienic characteristics of methods of collection, removal and disposal of solid and liquid waste; indicators of the sanitary condition of the soil; soil sampling rules for laboratory research and laboratory soil quality testing methods. Practical work: according to the situational problem and laboratory analysis of the soil, students make a reasonable conclusion about the sanitary condition of the soil and provide appropriate recommendations for the further use of the land plot.

Topic 4 Basics of rational nutrition

Lect.5 "Scientific and hygienic basics of nutrition" (Full-time)

The basic functions of food, types of biological action of food and varieties of nutrition, axioms of human biological existence and principles of rational nutrition, classification of alimentary diseases, modern theories of nutrition are considered.

Lect.6 "Nutritional Basics of Rational Nutrition" (Full-time)

The issues of scientific substantiation of energy value of nutrition and physiological and hygienic value of individual nutrients (proteins, fats, carbohydrates, vitamins, mineral elements) are considered. The problem of anti-alimentary factors of food is covered.

Lect.7 "Hygienic principles of nutrition of individual groups" (Full-time)

Issues of nutrition of children, brainworkers, employees of industrial enterprises and agriculture, athletes, pregnant and nursing women, elderly people, as well as issues of unconventional types of nutrition are considered.

Lect.8 "Basics of prevention of alimentary and alimentary-based diseases" (Full-time)

Issues of actual nutrition of the population of Ukraine and methods of determination of actual nutrition are considered; strategies and tactics to overcome nutrient deficits; therapeutic, preventive and ecologically protective nutrition as methods of disease prevention.

Pr.tr.10 "Methodology of determination and evaluation of human food status" (Full-time)

Students study the principles and conditions of healthy nutrition; methods of evaluation of actual nutrition, methods of determining the food status of a person; fundamentals of the organization of medical control over the nutrition of individuals and the organized team. Practical work: 1) according to situational problems, students identify and assess signs of inadequacy of the individual's nutrition and homogeneous by day mode and nutrition of organized teams by stomatoscopic, somatometric, physiometric, clinical and biochemical indicators; 2) students conduct functional tests for determining hypovitaminosis C (A tourniquet test (a Rumpel- Leede capillary-fragility test), Tilman`s test)

Pr.tr.11 "Methodology of calculation of human energy consumption and needs in nutrients" (Full-time)

Students master the methods of medical control over the energy consumption in various socio-professional and gender-age groups of the population and their nutrition. Practical work: 1) students conduct the timing of daily activities of an individual and a homogeneous team with a common daily routine and nutrition; 2) using instructional and additional materials, formulas and tables, students calculate individual human needs in nutrients.

Pr.tr.12 "Features of nutrition in people of different age and professional groups, athletes, pregnant and nursing, patients in hospitals" (Full-time)

Students study nutrition theory; physiological and hygienic value of food and physiological - hygienic characteristics of basic food products; principles of nutrition of people of different age groups and professional groups, athletes, pregnant and nursing, patients with different pathologies; principles of medical and preventive nutrition; basics of nutrition during environmentally unfavorable environment

Topic 5 Prevention of food poisonings

Lect.9 "Hygienic and nutritional characteristics of food products, organizational and legal bases of their expertise" (Full-time)

The lecture considers the issues of nutritional and dietary characteristics of food, quality and safety of food raw materials; organizational and legal bases of the state sanitary and epidemiological examination of food products; hygienic examination of milk, meat, fish, eggs, grain products, vegetables, fruits and berries, food fats, confectionery, beverages and taste substances. Problems of hygienic evaluation and regulation of transgenic food are covered; normalization of pesticides and fertilizer residues in food products, rationing of radioactive substances

Lect.10 "Food poisoning and their prevention" (Full-time)

The issues of the current state of the study of food poisoning and the legal basis of their investigations are considered; issues of etiology, classification, clinics, diagnosis and prevention of food poisoning (food staphylococcal intoxication, botulism, bacterial toxicoinfection, combotoxycosis, food mycotoxicosis, infections with the course of the disease inherent in food poisoning, food poisoning of non-microbial etiology) are highlighted.

Pr.tr.13 "Method of sanitary and hygienic examination of food products" (Full-time)

Students study organoleptic signs of quality and freshness of food products, principles of their hygienic normalization; indicators of completeness and signs of food spoilage; storage conditions and terms of food sales; rules of culinary treatment in order to preserve their benign quality, vitamins; indicators of quality and spoilage of milk and dairy products, cereals and bakery products, meat products and fish, eggs; indicators of quality and damage to canned goods, vegetables, fruits; food additives and their purpose; main food pollutants; food selection rules for laboratory research. Practical work: 1) using a digital milk analyzer, students study the quality indicators of milk samples and provide a hygienic assessment of the results; 2) according to situational tasks, students assess the quality of food and draw hygienic conclusions about the possibility of eating them; evaluate the consequences of the use of poor-quality products, provide preventive recommendations.

Pr.tr.14 "Method of investigation of cases of food poisoning" (Full-time)

Students study methods of diagnosis of food poisonings, their classification, main symptoms, methods of investigation of the causes of their occurrence, preventive measures to eliminate and prevent food poisoning. Practical work: according to the situational problem, students determine the type of food poisoning (preliminary diagnosis), the suspected product, anti-epidemic and preventive measures, draw up the necessary documents.

A15 "Final module test" (Full-time)

It is conducted in two stages: first, students provide answers to test tasks, after which they solve individual situational problems, according to the the topics of the module.

7.2 Learning activities

LA1	Solving the situational problems
LA2	Performance of individual practical tasks
LA3	E-learning in systems (Zoom, MIX.sumdu.edu.ua, Google Meet)
LA4	Making notes
LA5	Discussion
LA6	Preparation for lectures
LA7	Preparation for practical classes

8. Teaching methods

Course involves learning through:

TM1	Interactive lectures
TM2	Case-based learning
TM3	Think-pair-share method
TM4	Brainstorming
TM5	Case-study
TM6	Research work

The ability to conduct sanitary and hygienic and preventive measures are formed by: interactive lectures, case studies, peer assessment, brainstorming analysis of specific situations. Ability to assess the impact of the environment, socio-economic and biological determinants on the health of an individual, family, population are formed by peer assessment, brainstorming, analysis of specific situations, research work.

The ability of abstract thinking, analysis and synthesis are formed by: analysis of specific situations, brainstorming, case study, peer assessment. The ability to communicate in the state language both orally and in writing are developed through: peer assessment, analysis of specific situations. The ability to learn and master modern knowledge is formed by interactive lectures, analysis of specific situations, brainstorming, case studies. Ability to search, process and analyze information from different sources to analyze specific situations, exchange opinions, make informed decisions are developed by analysis of specific situations, brainstorming; case-method; peer assessment.

9. Methods and criteria for assessment

9.1. Assessment criteria

ECTS	Definition	National scale	Rating scale
	Outstanding performance without errors	5 (Excellent)	170 < RD < 200
	Above the average standard but with minor errors	4 (Good)	140 < RD < 169
	Fair but with significant shortcomings	3 (Satisfactory)	120 < RD < 139
	Fail – some more work required before the credit can be awarded	2 (Fail)	0 < RD < 119

9.2 Formative assessment

FA1	Peer assessment
FA2	Express-testing
FA3	Guidelines form the teacher in the process of performing the practical tasks
FA4	Interviews and oral comments of the teacher
FA5	Discussion and self-correction of students` works
FA6	Solving situational tasks

9.3 Summative assessment

SA1	Current assessment of practical tasks performance
SA2	Conducting a complex final writing test

Form of assessment:

4 semester		200 scores
SA1. Current assessment of practical tasks performance		120
	Assessment of current activities and continuous assessment	120
SA2. Conducting a complex final writing test		80
	Test and situational problems (2x40)	80

Form of assessment (special cases):

4 semester		200 scores
SA1. Current assessment of practical tasks performance		120
	in the case of quarantine restrictions, classes are provided with use of a modern distance techniques - Zoom, Meet, Mix.sumdu.edu.ua	120
Conducting a complex final writing test		80
	in the case of quarantine restrictions, classes are provided with use of a modern distance techniques - Zoom, Meet, Mix.sumdu.edu.ua	80

Assessment for discipline is the sum of assessments for current educational activities and for module control. The continuous assessment represents a general assessment for auditorial work based on the result of studying all topics and is carried out on a traditional 5-point scale. The average score is calculated, which is defined as the sum of all positive scores divided by the total number of them, then converted to scores of the credit-module scale by multiplying by the empirical coefficient 24. The maximum number of scores for current educational activity is 120, the minimum – 72. The final module control is allowed for students who have attended all classes, have completed all types of work by the curriculum, and in the course of current educational activity have gained at least 72 points. In case of lack of points for current achievements, the student has the opportunity to increase his/her assessment by drawing up additional written control, which includes questions on all topics of the module. Final module control is carried out in 2 stages: 1 stage - computer testing (control of theoretical knowledge); 2 stage - solving of situational problem (control of practical skills). Computer testing is carried out using Assistant program or on the MIXLearning platform. The number of control tests is 20. According to the results a student receives a score equal to the number of correct answers. The second stage of final module control is carried out in writing. Number of questions (tasks) in the ticket - 4. Each question (task) is evaluated by a 5-point scale, then the score is converted to points of the credit-modular-rating scale as follows: "5" - 10 scores, "4" - 8 scores, "3" - 6 scores, "2" - 0 scores. Final module control is credited if the student scored at least 48 points for both stages.

10. Learning resources

10.1 Material and technical support

MTS1	Information and communication systems
MTS2	Multimedia, video and sound reproduction, projection equipment (video cameras, projectors, screens)
MTS3	Computers, computer systems and networks
MTS4	Software (support of distance learning, Internet testing, virtual laboratories, virtual patients, creation of computer graphics, modeling, etc.)
MTS5	Instruments (measuring, mobile mini-laboratories, etc.)
MTS6	Environmental objects

10.2 Information and methodical support

Essential reading	
1	Hygiene and ecology: Textbook / Edited by VG Bardova. - Vinnytsia: Nova Kniga, 2020. - 720 p.
2	Law of Ukraine "On Ensuring Sanitary and Epidemic Welfare of the Population". Fundamentals of Ukrainian legislation on health care
Supplemental reading	
3	General hygiene. Socio-hygienic monitoring: textbook. for universities / PI Melnichenko [etc.]: ed. PI Melnichenko. - M.: Practical Medicine, 2015. - 512 p.
4	Food hygiene with the basics of nutrition: Textbook; in 2 books. - Book: / Fore. prof. VI Cyprian. K.: Медицина, 2007. - 544 с.

8	Закон України «Про молоко та молочні продукти» https://zakon.rada.gov.ua/laws/show/1870-15#Text
9	Закон України «Про державну систему біобезпеки при створенні, випробуванні, транспортуванні та використанні генетично модифікованих організмів» https://www.president.gov.ua/documents/1103-v-6039
10	ЗАКОН УКРАЇНИ "Про охорону атмосферного повітря" http://search.ligazakon.ua/l_doc2.nsf/link1/ed_1995_02_28/T270700.html

