/translation from Russian into English/
MINISTRY OF EDUCATION AND SCIENCE OF THE KYRGYZ REPUBLIC
MINISTRY OF HEALTH OF THE KYRGYZ REPUBLIC
I.K. AKHUNBAEV KYRGYZ STATE MEDICAL ACADEMY

APPROVED
Rector

/signed/ I.O. Kudaibergenova

dated «19» 11, 2024

WORK PROGRAM
by discipline
Green Technologies in Medicine

Faculty	**All faculties**
Year	All courses
Semester	5
Total labor intensity	2 credit hours
Total hours	60 hours
Lectures	10
Practical classes	8
Independent work	30 hours
Types of final control	Credit

Bishkek - 2024

Work program:

compiled on the basis of	State Educational Standard of Higher Professional Education 560001 “General Medicine” approved by Order of the Ministry of Education and Science of the Kyrgyz Republic No. 1357/1 dated July 30, 2021. State Educational Standard of Higher Professional Education 560002 “Pediatrics” approved by order of the Ministry of Education and Science of the Kyrgyz Republic No. 1578/1 dated September 21, 2021. State Educational Standard of Higher Professional Education 560003 “Public Health” approved by Order of the Ministry of Education and Science of the Kyrgyz Republic No. 1578/1 dated September 21, 2021. State Educational Standard of Higher Professional Education 560004 “Dentistry” approved by order of the Ministry of Education and Science of the Kyrgyz Republic No. 1578/1 dated September 21, 2021. State Educational Standard of Higher Professional Education 560005 “Pharmacy” approved by order of the Ministry of Education and Science of the Kyrgyz Republic No. 1578/1 dated September 21, 2021. State Educational Standard of Higher Professional Education “560006” Nursing approved by order of the Ministry of Education and Science of the Kyrgyz Republic No. 1578/1 dated September 21, 2021.
developed	Head of the Department of General Hygiene, PhD, Associate Professor Dzhorbaeva A.A. Associate Professor of the Department of General Hygiene, PhD, Acting Associate Professor Sultashev A.Zh.
reviewed	External review (employer: Deputy Director of the Department of Disease Prevention and State Sanitary and Epidemiological Surveillance. Ministry of Health of the Kyrgyz Republic, Ph.D., Ch. Shamsutdin Internal review: Associate Professor of the Department of Scientific Research Management of I.K. Akhunbaev KSMA Ph.D., Kudayarova M.Zh.
discussed at the meeting:	EMC in the specialty "General Medicine" (Protocol No. 3 of November 12, 2024)
approved at the meeting:	MEMC (minutes No. 3 of November 19, 2024)

Annotation

The elective course “Green Technologies in Medicine” offered by the faculties of General Medicine, General Medicine with English language of instruction, Pediatrics, Pharmacy, Dentistry, Public Health, and Nursing at the I.K. Akhunbaev Kyrgyz State Medical Academy is a course exploring modern technological solutions aimed at reducing humanity's negative impact on the environment. Rapid technological advances and environmental changes pose new challenges that require innovative approaches, making this course especially relevant.

The course will cover a wide range of green technologies, such as alternative energy sources, energy-efficient technologies, sustainable construction, waste management, and more. Students will also explore examples of successful green technology implementation in various industries, including medicine, and their impact on the economy, society, and the environment.

Learning Objective:	This course is designed for students who want to understand the role of technology in creating a sustainable future and integrate knowledge of green technologies into their professional work. Upon completion of the course, students will have a fundamental understanding of green technologies and the ability to apply them in practical situations to address contemporary environmental challenges.
Learning Objectives:	The objectives of studying the discipline are to enable students to acquire academic competence, the basis of which is: • Introduction to the basics of green technologies. • Developing energy saving and energy efficiency skills. • Formation of knowledge about resource management. • Study of innovative environmental technologies in medicine. • Developing practical skills and fostering environmental responsibility.
The place of the discipline in the structure of the Educational Program	**Prerequisites:** To successfully complete the Green Technologies course, students must have basic knowledge and skills acquired in the following medical disciplines and topics: **1. Biology:** - Knowledge of basic biological processes and ecological systems. - Understanding the impact of human activities on the environment. **2. General Chemistry:** - Basic chemical concepts and processes. - Understanding of environmentally friendly chemical reactions and substances. **3. General hygiene:** - Basic concepts and processes in medicine. - Knowledge of the functioning of medical institutions and basic procedures. - Understanding the principles of hygiene and sanitation in medical practice. - Skills in maintaining sanitary norms and standards. **Required knowledge, skills and abilities:** **Knowledge:** - Fundamentals of green technologies and their application in medicine. - Principles of energy conservation and sustainable use of resources. - Methods of medical waste management and recycling. - Modern innovative technologies and their environmental impact. **Skills:**

	- Application of theoretical knowledge in practice through laboratory and practical classes. - Analysis and evaluation of the effectiveness of the implementation of green technologies in medical institutions. - Planning and implementation of environmental events and projects. - Work with regulatory documentation and standards in the field of environmental safety. **Owns:** - Critical thinking and data analysis skills. - Ability to work in an interdisciplinary team. - Efficient use of resources and process optimization. - Communication skills and presentation of environmental projects and research.
	Post details. Upon completion of the Green Technologies course, students should be prepared for further study and practical work in the following areas: **1. Management in healthcare:** - Application of sustainable development principles and green technologies in the management of medical institutions. - Skills in planning and implementing environmental initiatives in the medical field. **2. Environmental safety and health protection:** - Understanding the relationship between ecology and human health. - Ability to assess environmental risks and develop measures to minimize them. - Readiness to implement and use innovative environmental technologies in medical practice. - Participation in scientific research and development of new methods and means of treatment, taking into account environmental aspects. **4. Medical ethics and law:** - Understanding the legal and ethical aspects of using green technologies in medicine. - Skills for making informed decisions taking into account environmental and legal standards. **5. Research management:** - Ability to conduct independent research in the field of green technologies. - Skills in developing and implementing environmental projects in the medical field.

The student's competencies developed as a result of mastering the discipline:

General Medicine	PC-10, PC-11,PC-32, PC-33
Pediatrics	PC-10, PC-11
Medical and preventive care	PC-13
Dentistry	PC-8, PC-9, PC-10
Pharmacy	PC-14
Nursing	PC-13, PC-15

List of planned learning outcomes for the course “Green Technologies in Medicine” correlated with the planned learning outcomes for the educational program

The study of this academic discipline is aimed at developing the following general cultural (GC), general professional (GP) and professional (PC) competencies, instrumental competencies (IC), and social and personal competencies (SPC) in students:

The "Green Technologies in Medicine" program for medical academy students may be linked to several competencies from the listed categories. Below is a list of the relevant competencies and a rationale for their connection to the program.

General competencies:

General Scientific Competence -1: Capable and ready to analyze socially significant problems and processes, to use methods of natural sciences, mathematics and humanities in various types of professional and social activities.

Result: The Green Technologies program requires the analysis of environmental issues and their impact on health, the use of scientific methods to evaluate and implement technologies, which is consistent with this competency.

General Scientific Competence -3: Able and willing to collect, process and interpret, using modern information technologies, data necessary for forming judgments on relevant social, scientific and ethical issues.

Rationale: The course examines methods of collecting and analyzing data on the impact of green technologies, the use of information technology for monitoring and assessing the environmental situation.

General Scientific Competence -4: Able and willing to work in a team, tolerant of social, ethnic, religious and cultural differences.

Rationale: The implementation of green technologies requires working in interdisciplinary teams and taking into account various cultural and social aspects when implementing environmental projects.

Instrumental competencies:

IC-1: Capable and ready to work with computer equipment and software for system and application purposes to solve professional problems.

Rationale: Use of specialized software for modeling environmental processes, data analysis and resource management.

IC-2: Able and willing to use information, bibliographic resources and information and communication technologies, taking into account the basic requirements of information security.

Rationale: Students learn to use information resources to search for scientific literature, data on green technologies and their application in medicine.

IC-4: Able and willing to use management methods; organize the work of performers; find and make responsible management decisions in the face of varying opinions and within the limits of their professional competence.

Justification: The program includes elements of project management for the implementation of green technologies, which requires appropriate management skills.

Social, personal and general cultural competencies:

SPC-1: Able and ready to implement ethical, deontological and bioethical principles in professional activities.

Rationale: Green technologies are related to bioethics and responsible use of natural resources, which is important for medical practice.

SPC-2: Capable and ready to master professional communication techniques; build interpersonal relationships, work in a group, constructively resolve conflict situations, and tolerate social, ethnic, religious, and cultural differences.

Rationale: Teamwork and interaction with various stakeholders for the successful implementation of green technologies.

SPC-3: Capable and ready for continuous professional development, self-knowledge, self-development, and self-actualization; able to manage one's time, plan and organize one's activities, and develop a strategy for personal and professional development and learning.

Rationale: Studying green technologies requires continuous knowledge updating, self-development, and career planning in the fields of ecology and medicine.

SPC-5: Capable and ready for logical and reasoned analysis, public speaking, discussion and debate, carrying out educational and upbringing activities, and cooperation.

Rationale: The program includes discussions and presentations on green technology topics, which contribute to the development of public speaking skills and reasoned analysis.

Professional competencies:

PC-10: Capable and ready to carry out preventive measures to prevent infectious, parasitic and non-infectious diseases.

Rationale: The implementation of green technologies can contribute to disease prevention by improving the environmental situation and reducing harmful impacts.

PC-11: Capable and ready to conduct public health education work to eliminate modified risk factors for disease development and provide recommendations on healthy eating.

Justification: Sanitary and educational work on the introduction of green technologies and the promotion of environmentally friendly methods of housekeeping and nutrition.

PC-32: Capable and willing to plan and conduct scientific research.

Rationale: The use of green technologies in scientific research contributes to the development of more sustainable and environmentally friendly approaches to science. These technologies minimize negative environmental impacts while simultaneously improving the quality of research by optimizing resource consumption and implementing innovative methods. Students with knowledge in this area will be able to conduct research taking into account sustainable development principles and develop new methodologies aimed at reducing carbon footprints and utilizing renewable resources.

PC-33: Capable and ready to implement new methods and techniques aimed at protecting public health.

Rationale: The implementation of "green" technologies is directly aimed at reducing the harmful impact on the environment and human health, creating the foundation for improving quality of life. New methods and techniques developed using environmentally friendly technologies contribute to the prevention of chronic and acute diseases, improve living conditions, and reduce pollution levels. This includes the introduction of energy-efficient and environmentally friendly solutions, which improve health care and reduce the risk of pollution exposure for the population.

No.	Code (leave only PC)	Content of competence	As a result of studying the academic discipline, students must:		
			Know	**Be able to**	**To own**
1.	PC-10	WITH capable and ready to carry out preventive measures to prevent infectious, parasitic and non-infectious diseases	**To know:** Information on methods of preventing diseases associated with natural, climatic and microclimatic conditions, the chemical composition of drinking water, soil, atmospheric air, indoor air and lighting, conditions of education and upbringing, everyday life, work and rest.		
			Be able to: Carry out preventive measures to prevent infectious, parasitic and non-infectious diseases, conduct sanitary and educational work on hygiene issues (environmental hygiene, occupational and rest hygiene, food hygiene, hygiene of children and adolescents, personal hygiene, military hygiene)with the population and health care personnel		
			To own: Methods of implementationsanitary and educational work on hygiene issues (environmental hygiene, occupational and rest hygiene, food hygiene, hygiene of children and adolescents, personal hygiene, military hygiene)with the population and health care personnel;		
2.	PC-11	Capable and willing to conduct public health education work to eliminate modified risk factors for disease development and provide recommendations on healthy eating	**To know:** Knowledge: Population health indicators and the factors that shape them. Diseases associated with the adverse effects of climatic and social factors. Hygienic aspects of nutrition. Principles of food safety. Fundamentals of preventive medicine, the organization of preventive measures aimed at improving public health, lifestyle characteristics and human habits, including harmful ones (smoking, physical inactivity, poor diet, alcohol abuse, etc.);		
			Be able to: Conduct activities with the population on primary and secondary prevention of the most common diseases, implement preventive measures to increase the body's resistance to adverse environmental factors using various methods of physical education and sports, hardening, and promoting a healthy lifestyle. Conduct prevention of nutrition-related diseases and principles of food safety, and provide recommendations on organizing sufficient physical activity and healthy eating.		

			To own: Elements of hygienic diagnostics and basic methods for assessing the effectiveness and adequacy of nutrition and components of the daily routine, organization-activities aimed at changing lifestyle Methodology for working with the system of regulatory legal acts adopted by the legislative authority of the Kyrgyz Republic regarding compliance with sanitary and epidemiological conditions for the life of citizens. Methodology for assessing working conditions of medical workers, includingjunior medical personnel of medical and preventive organizations
3.	PC-32	Capable and readyto planning and conducting scientific research;	**To know:** Key promising areas of research in hygiene
			Be able to: Plan and conduct scientific research within the framework of the student's assigned research work
			To own: Research organization skillsas part of the student's assigned research work
4.	PC-33	Capable and readyto the introduction of new methods and techniques aimed at protecting public health.	**To know:** Theoretical foundations for conducting primary, secondary and tertiary prevention at the individual, group and state levels
			Be able to: Apply knowledge of hygiene, organization of medical care and prevention in their professional and scientific activities.
			To own: Methods for assessing the impact of risk factors on health, applied at the individual, group and population levels

Scope of the discipline, types of academic work and forms of control

Faculties of General Medicine, General Medicine, Pediatrics, Pharmacy, Dentistry, MPD, and VSO

Credits	Total	Classroom hours		SRS	Forms of control
		lectures	practice		
2	60	10	20	30	credit

Thematic plans for lectures, practical classes, and independent work for students in the elective course "Green Technologies in Medicine"

Thematic plan for lectures:

No.	Lecture topic	Number of hours
1.	Introduction to green technologies and their role in medicine	2
2.	Energy-efficient and environmentally friendly solutions for healthcare facilities	2
3.	Medical waste management and disposal	2
4.	Sustainable water use and resource management in healthcare settings	2
5.	Innovation and green technologies in medical research and development	2
	Total:	10

Thematic plan for practical classes:

No.	Topic of the practical lesson	Number of hours
1.	Development and implementation of a plan to reduce the carbon footprint of a healthcare facility	2
2.	Development of a resource monitoring and management system	2
3.	Life cycle analysis of medical materials and devices	2
4.	Assessment of the potential for using alternative energy sources	2
5.	Analysis of energy consumption in a healthcare facility and energy management planning	2
6.	Analysis and optimization of water consumption	2
7.	Environmental impact assessment of medical equipment	2
8.	Use of environmentally friendly disinfectants	2
9.	Sustainability analysis of an existing medical facility	2
10.	Medical waste management	2
	Total:	20

Thematic plan for conducting the independent work study:

No.	Theme of independent work	Number of hours
1.	Development of a plan for energy-efficient modernization of a medical facility	6
2.	Using renewable energy sources to meet the energy needs of a medical facility	6
3.	Development of a project to create a "green" garden or patio on the territory of a medical facility	6
4.	Design of a green wing or facility within a medical facility	6
5.	Development of a program for the implementation of a waste management system in a medical institution	6
	Total:	30

CONTENTS OF THE WORK PROGRAM

Contents of lecture topics:

1. Introduction to green technologies and their role in medicine
Definition of green technologies: Technologies aimed at minimizing environmental impact. Role in medicine: Sustainable practices can reduce carbon footprints, lower costs, and improve patient care. Examples of green technologies: Solar energy, energy-efficient buildings, and renewable energy. Benefits for healthcare: Improved environmental conditions and a safer environment for patients and healthcare workers.

2. Energy-efficient and environmentally friendly solutions for healthcare facilities
Energy-efficient technologies: Installation of LED lighting, smart heating and air conditioning systems. Smart buildings: Use of energy management systems (BMS) to optimize resource consumption. Renewable energy sources: Solar panels, wind turbines, rainwater harvesting systems. Reducing energy consumption: Energy-saving measures such as improved insulation and the use of energy-efficient equipment.

3. Management and disposal of medical waste
Medical waste classification: Infectious, radioactive, chemical, and solid waste. Disposal methods: Autoclaving, thermal treatment, incineration, recycling, and safe burial. Environmentally friendly approaches: Waste reduction, material recycling, use of biodegradable materials. Legal regulations: National and international requirements for waste management in the medical field.

4. Sustainable water use and resource management in healthcareinstitutions
Water conservation: Use of water-saving devices (faucets, toilets), water recycling systems. Wastewater treatment: Water purification technologies to prevent environmental pollution. Water quality control: Regular monitoring to ensure patient and staff safety. Resource management: Strategies for the efficient use and conservation of natural resources.

5. Innovation and green technologies in medical research and development
Green Labs: Using energy-efficient equipment and reducing the use of toxic substances. Green Chemistry: Developing drugs and medical materials with minimal environmental impact. Innovative Technologies: 3D printing, telemedicine, and the use of big data to improve healthcare efficiency. Sustainable Medical Equipment: Manufacturing and disposing of medical devices in accordance with environmental standards.

Contents of topics for practical classes:

1. Develop and implement a plan to reduce the carbon footprint of a medical institution

Assessing current CO2 emissions: Using carbon footprint calculation methods. Identifying emission sources: Analyzing energy consumption, transportation, and waste disposal. Developing a carbon footprint reduction strategy: Implementing renewable energy sources, improving energy efficiency, and reducing waste.
Implementing the plan: Creating milestones, monitoring effectiveness and adjusting actions.

2. Development of a resource monitoring and management system

Identifying key resources: Water, electricity, medical supplies. Selecting monitoring methods: Installing consumption sensors, software solutions for resource use monitoring.
Data collection analysis: Identification of peak consumption periods and inefficiencies. Management system implementation: Integration of automated solutions to optimize resource use.

3. Life cycle analysis of medical materials and products

Life Cycle Analysis Methods: Collecting data on the production, use, and disposal of materials. Environmental Risk Assessment: Identifying life cycle stages that cause the greatest environmental impacts. Recommendation Development: Optimizing the supply chain and using recyclable or biodegradable materials.
Material Comparison: Evaluation of Alternatives Based on Environmental Sustainability.

4. Assessment of the potential for using alternative energy sources

Analysis of available alternative energy sources: Solar, wind, and geothermal energy. Feasibility assessment: Economic analysis of the implementation of alternative energy sources. Implementation plan: Development of a strategy for the installation and integration of renewable energy sources into existing infrastructure. Regulatory review: Analysis of legislation and subsidies for the implementation of green technologies.

5. Analysis of energy consumption in a healthcare facility and energy management planning

Energy consumption data collection: Use of energy meters and historical data. Peak demand identification: Identify inefficient resource use. Developing an energy reduction plan: Upgrading equipment, using energy-efficient technologies. Monitoring and control: Continuously monitoring consumption and adjusting the plan.

6. Analysis and optimization of water consumption

Assessing current consumption: Collecting water use data. Identifying opportunities for reduction: Using water-saving technologies (aerators, water recirculation systems). Developing an optimization plan: Implementing measures to reduce water consumption and treat wastewater. Monitoring results: Regularly analyzing the effectiveness of water conservation measures.

7. Environmental impact assessment of medical equipment

Equipment Life Cycle Assessment: Analyzes environmental impacts from production to disposal. Selecting environmentally friendly equipment: Compares equipment based on energy consumption and recyclability. Recycling Plan: Develops a

recycling or safe disposal program. Impact Monitoring: Assesses the level of harmful emissions and energy consumption of equipment.

8. Use environmentally friendly disinfectants

Analysis of current disinfectants: Study of chemical composition and environmental impact. Selection of alternatives: Search for and testing of environmentally friendly disinfectants. Development and implementation of a replacement strategy: Training of staff and transition to new products. Efficiency and safety assessment: Analysis of the impact of new products on disinfection effectiveness and health safety.

9. Analysis of the sustainability of the existing medical institution

Building energy efficiency assessment: Building audits, use of technologies to reduce energy costs. Environmental compliance assessment: Study of international standards and their application. Modernization plan development: Implementation of energy-saving technologies and green solutions. Change monitoring: Evaluation of improvements after implementation of measures.

10. Medical waste management

Analysis of existing waste management practices: Identification of problems and opportunities for improvement. Waste classification: Determination of waste types and safe disposal methods. Implementation of recycling and disposal systems: Installation of equipment and training of waste management and disposal personnel. Monitoring of recycling volumes and quality: Continuous evaluation of the effectiveness of implemented measures.

Content and structure of projects for organizing independent work of student (IWS)

1. Development of a plan for energy-efficient modernization of a medical facility

Structure:

1. **Introduction**
    - Assessment of the current energy efficiency of the institution.
    - Goals of energy efficient modernization.
2. **Data collection methods**
    - Energy consumption measurement (meter readings, electricity bill analysis).
    - Study of building heat losses, equipment audit.
3. **Analysis and calculation of energy-efficient solutions**
    - Using mathematical models to calculate savings.
    - Comparison of alternatives (improved insulation, intelligent control systems, energy-efficient appliances).
4. **Development of a modernization plan**
    - Equipment and materials replacement plan.

- Estimation of necessary costs and implementation timeframes.

5. **Expected results**
   - Projected energy savings.
   - Impact on an institution's carbon footprint.
6. **Conclusion**
   - Summarizing the results of scientific analysis and design solutions.

2. Using renewable energy sources to meet the energy needs of a medical institution

Structure:

1. **Introduction**
   - Review of modern renewable energy sources (solar, wind, geothermal).
   - Relevance for medical institutions.
2. **Energy needs study**
   - Analysis of daily and seasonal energy consumption in the institution.
   - Estimation of energy required for critical systems (lighting, HVAC, medical equipment).
3. **Analysis of potential energy sources**
   - Scientific research and calculation of the possibilities of installing solar panels, wind turbines, etc.
   - Evaluation of efficiency and payback.
4. **Renewable energy system project**
   - Development of a power distribution scheme.
   - Equipment installation plan.
5. **Impact assessment**
   - Forecast for reduction in energy costs and CO2 emissions.
6. **Conclusion**
   - Justification of the choice of renewable sources and calculation of expected benefits.

3. Development of a project for the creation of a "green" garden or patio on the territory of a medical institution

Structure:

1. **Introduction**
   - The importance of green spaces for healthcare facilities (ecological and therapeutic aspects).
2. **Exploring the place**
   - Assessment of available space on the territory of a medical institution.
   - Analysis of microclimate and soil conditions.
3. **Scientific justification for plant selection**
   - Studying locally resilient plants that contribute to environmental improvement.
   - Biodiversity-based zoning.
4. **Garden/patio design**
   - Sketches and layout plans.
   - Plant care plan and their integration into the healing process.

5. **Environmental and economic impact**
    - Projected improvement in air quality and microclimate.
    - Expected economic and therapeutic benefits.
6. **Conclusion**
    - Results of the project and proposals for its implementation.

4. Design of a green wing or facility on the premises of a medical facility
Structure:

1. **Introduction**
    - The concept of "green" construction in the medical field.
2. **Analysis of existing infrastructure**
    - Assessment of the current building and needs of the healthcare facility.
3. **Scientific principles of green building**
    - Energy efficient materials and systems.
    - Use of sustainable technologies and materials (environmentally friendly coatings, ventilation systems with recuperation).
4. **Design of a "green" wing/facility**
    - Creating a building model with minimal environmental impact.
    - Plans to improve water and energy consumption.
5. **Environmental Impact Assessment**
    - Comparative analysis of CO2 emissions before and after construction.
6. **Conclusion**
    - Scientific justification of the effectiveness and usefulness of the project.

5. Development of a program for the implementation of a waste management system in a medical institution
Structure:

1. **Introduction**
    - The problem of medical waste and the need to implement management systems.
2. **Analysis of current waste management systems**
    - Assessment of the volumes and types of waste generated in the institution.
3. **Methods of scientific analysis of recycling**
    - Study of methods of disposal of medical waste: thermal treatment, autoclaves, chemical neutralization.
4. **Development of a waste management system**
    - Plan for the implementation of sorting, recycling and safe disposal systems.
    - Training of personnel on the proper handling of medical waste.
5. **Assessment of environmental and economic efficiency**
    - Reducing environmental impact.
    - Reducing costs for waste disposal and recycling.
6. **Conclusion**
    - Final assessment of the system implementation and predicted results.

Control questions for assessing practical classes:

1. What methods are used to calculate a healthcare facility's carbon footprint?
2. What are the most significant sources of CO2 emissions in healthcare facilities?
3. What are the key steps in developing a carbon footprint reduction plan?
4. What measures can be taken to reduce the carbon footprint (e.g. using renewable energy, improving energy efficiency)?
5. How to evaluate the effectiveness of the plan's implementation and its impact on reducing the carbon footprint?
6. What resources (water, energy, medical supplies) need to be monitored in a healthcare facility?
7. What technologies and methods can be used to monitor resource consumption?
8. How to develop a resource management system to effectively use and optimize resources?
9. What data needs to be collected to analyze resource consumption and management?
10. How can the effectiveness of a resource monitoring and management system be assessed?
11. What stages of the life cycle of medical materials and devices should be taken into account (production, use, disposal)?
12. How to identify environmental risks at each stage of the life cycle?
13. What life cycle analysis methods can be used to assess the environmental impact of medical devices?
14. How to choose the most environmentally sustainable materials and products?
15. What recommendations can be made to reduce the negative environmental impact?
16. What alternative energy sources can be considered for a healthcare facility?
17. How to evaluate the economic and environmental feasibility of using various alternative energy sources?
18. What factors need to be considered when calculating the potential of alternative energy sources?
19. How to plan for integrating alternative energy sources into existing energy infrastructure?
20. What are the potential problems and solutions that may arise when introducing alternative energy sources?
21. How to analyze current energy consumption in a healthcare facility?
22. What methods and tools can be used to analyze energy consumption?
23. How to identify the main areas and equipment consuming the most energy?
24. What strategies can be applied to manage and reduce energy consumption?
25. How to evaluate the results of implementing energy management plans?
26. What methods can be used to analyze current water consumption in a healthcare facility?

27. How to identify key areas and processes contributing to high water consumption?
28. What technologies and measures can help optimize water consumption?
29. How can water reuse and purification systems be implemented?
30. How to evaluate the effectiveness of measures to reduce water consumption?
31. What factors should be considered when assessing the environmental impact of medical equipment (production, use, disposal)?
32. How can a life cycle analysis of medical devices be conducted in terms of their environmental impact?
33. What criteria are used to select environmentally sustainable equipment?
34. How to assess the impact of medical equipment on the environment and human health?
35. What recommendations can be made to reduce the environmental impact of medical equipment?
36. What types of eco-friendly disinfectants are available for use in healthcare settings?
37. What are the advantages and disadvantages of eco-friendly disinfectants compared to traditional ones?
38. How can the effectiveness and safety of environmentally friendly disinfectants be assessed?
39. What methods and procedures should be considered when introducing new disinfectants?
40. How can the impact of using eco-friendly disinfectants on overall safety and health in a facility be measured?
41. What criteria are used to assess the sustainability of a healthcare facility (energy efficiency, ecology, resource management)?
42. How to conduct an audit of the current state of sustainability of an institution?
43. What aspects of sustainability require improvement and how can this be achieved?
44. What recommendations can be made to improve the sustainability of an existing institution?
45. How to evaluate the effectiveness of implemented measures to improve resilience?
46. How to classify medical waste and what methods of disposal exist?
47. What regulations and standards should be considered when managing medical waste?
48. How to develop an effective healthcare waste management program in a facility?
49. What modern methods of processing and disposal of medical waste can be implemented?
50. How to evaluate the effectiveness and savings of implementing a healthcare waste management program?

Bibliography:

Main:

1.Managing the green development of the national economy: Lecture notes / E.B. Dorina, T.V. Bukhovets; Project "Assistance in the transition of the Republic of Belarus to a "green" economy". - Minsk: Belsens, 2017. - 191.

Further reading:

1. Barysheva Galina Anzelmovna, Egorova Maria Sergeevna Green technologies: definition of the concept, stages of formation and role in sustainable economic development // Theory and practice of social development. 2019. No. 12 (142). URL: https://cyberleninka.ru/article/n/zelenye-tehnologii-opredelenie-ponyatiya-etapy-stanovleniya-i-rol-v-ustoychivom-razvitii-ekonomiki.
2.Green innovation in hospitals: technology and sustainability for a healthier future. URL: https://tediselmedical.com/en/green-innovation-in-hospitals-technology-and-sustainability-for-a-healthier-future/