

Catalog of elective disciplines

1. Department: Department of Chemical Disciplines, Biology and Biochemistry

2. Level of preparation: bachelor's degree

3. Specialty: 6B10101 - Medicine, 6B10102 - Pediatrics, 6B10103 - Dentistry

4. Course: 1

5. Name of the elective discipline: Chemistry

6. Number of credits: 4

7. Purpose: The purpose of the discipline is to form a holistic physicochemical, natural science approach to the study of the human body and its environment in students, as well as to substantiate the chemical and physicochemical aspects of the most important biochemical processes and various types of equilibria occurring in a living organism. Formation of a student - dentist of systemic knowledge about the basic physical and chemical laws of the course of biochemical processes (normal and pathological) at the molecular and cellular levels; about the structure and mechanisms of functioning of biologically active compounds; the formation of the natural scientific thinking of specialists in the medical dental profile, as well as the competence and professionally significant personality traits.

8. Tasks

- to form an understanding of equilibria in aqueous solutions of strong and weak electrolytes;
- to teach to apply physical and chemical laws to the description of biochemical processes in the body;
- to give an understanding of the basic principles of qualitative and quantitative analysis;
- to teach the use of chemical and physicochemical methods of analysis;
- to study the most important laws of electrochemistry that allow predicting corrosion resistance and optimizing the search for new structural dental materials;
- to form the concept of the relationship between the chemical composition, structure, properties and biological activity of substances;

9. Rationale for the choice of discipline

It is well known that in modern conditions the key task of higher education is the fundamental nature of education. Chemistry is a fundamental science and a powerful tool for research and knowledge of processes in living systems. Therefore, students of medical specialties should master well the basic ideas, laws and methods of this science. The program is supposed to consider the basics of the most important topics of the course of inorganic, analytical and physical chemistry. The discipline "Chemistry" prepares a theoretical basis for the development of some sections of biochemistry, molecular biology, physiology, pharmacology, hygiene and provides a broader involvement of the scientific approach and the latest research methods, gleaned from the fundamental sciences, in the study of biomedical, clinical disciplines. The task of profiling the course is an in-depth study of such topics as the composition of bone tissue, the composition of saliva and its mineralizing function, the processes occurring in the oral cavity. The knowledge gained by students during the passage of the topics "Phase equilibria", "Corrosion of metals and alloys", "Surface phenomena. Adsorption" are the physicochemical basis for the subsequent study of orthopedic and therapeutic dentistry. An important task of optimizing higher medical education is the expansion of interdisciplinary connections and the integration of fundamental, biomedical and clinical disciplines.

10. Outcomes of learning

Knowledge (cognitive domain)	Skills and experiences (psychomotor sphere)	Personal and professional competencies (relationships)
Demonstrates knowledge and understanding: - chemical processes (main types of reactions) in the body, obeying the general laws and laws of chemistry;	- uses calculation formulas (mass fraction, molar concentration, molar concentration equivalent, molar concentration, molar fraction, titer) to determine the quantitative content of	- formulates the general theoretical foundations of chemistry for the application of the acquired knowledge, skills and abilities in their subsequent professional activities. -

- general energy and kinetic patterns of chemical processes; - the possibility of using the analysis of medicines using chemical, physico-chemical and other methods; - possible methods for preparing solutions, their quantitative characteristics; - classification, properties and application in medicine of the main classes of organic compounds.	substances in a solution, including biological fluids; - prepares the solution by the dilution method; - uses a certain set of chemical utensils, reagents, basic instruments and methods of physicochemical measurements used in medicine; - complies with the rules of labor protection and safety measures, has the skills of safe work in a chemical laboratory, knows how to provide first aid.	analyzes, systematizes information on the laws and experimental research in the field of chemistry, using computer technology and an information database of medical sources. - informs and explains the observed patterns in the field of chemistry on the issues of their application in medicine;
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11. Prerequisites: disciplines of secondary general education: chemistry, biology, physics and mathematics.

12. Post requisites: medical biochemistry, morphology and physiology.

13. Literature In Kazakh language:

Main:

1. Қ. Н. Дауренбеков, Қ. М. Серимбетова, А. Ш. Өмірқұлов Химия : оқу құралы / . - Шымкент : Әлем баспаханасы, 2019. - 272 бет.

2. Сейтембетов, Т. С. Химия: оқулық / Т. С. Сейтембетов. - Алматы : Эверо, 2010.

Additional:

1. Тюкавкина Н.А., Бауков Ю.И., Зурабян С.Э., қазақ тіліне аударған ж/е жауапты редакторы С.Т.Сейтембетов. Биоорганикалық химия: оқулық / – М : ГЭОТАР – Медиа, 2014. – 400 б.

2. Патсаев, Ә. Қ. Химия пәні бойынша тестілері. 1-бөлім. Бейорганикалық, физколлоидтық химия пәні бойынша тестілері. II-бөлім. Биоорганикалық химия пәні бойынша тестілер : тестілер. - Шымкент : Б. ж., 2010.

Literature In Russian language:

Main:

1. Глинка, Н. Л. Общая химия. Т.1: учеб. пособие для вузов - Алматы : Эверо, 2014

2. Глинка, Н. Л. Общая химия. т. 2 : учеб. пособие для вузов - Алматы : Эверо, 2014

3. Глинка, Н. Л. Общая химия. Т. 3. : учеб. пособие для вузов - Алматы : Эверо, 2014

4. Глинка, Н. Л. Общая химия. т. 4 : учеб. пособие для вузов. - Алматы : Эверо, 2014

5. Жолнин А. В. Общая химия: учебник / А. В. Жолнин ; под ред. В. А. Попкова.- М. : ГЭОТАР - Медиа, 2012

Additional:

1. Патсаев, А. К. Тесты по дисциплине "химия". Ч. 1. Тесты по неорганической, физколлоидной химии. Ч. 2. Тесты по биоорганической химии : тесты . - Шымкент : Б. и., 2010

2. Веренцова Л.Г., Нечепуренко Е.В. Неорганическая, физическая и коллоидная химия. – Алматы: издательство «Эверо», 2014.

Literature In English language:

1. Glinka, N. L. General chemistry. Volum 1. : manual for graduate students / N. L. Glinka, S. S. Babkina. - 27th ed. - Almaty : "Evero" , 2017. - 232 p.

2. Glinka, N. L. General chemistry. Volume 2.: manual for graduate students / N. L. Glinka, S. S. Babkina. - 27th ed. - Almaty : "Evero" , 2017. - 176 p.

3. Glinka, N. L. General chemistry. Volum 3.: manual for graduate students / N. L. Glinka, S. S. Babkina. - 27th ed. - Almaty : "Evero" , 2017. - 248 p.

4. Glinka, N. L. General chemistry. Volum 4.: manual for graduate students / N. L. Glinka, S. S. Babkina. - 27 th ed. - Almaty : "Evero" , 2017. - 176 p.

5. Nazarbekova, S. P. Chemistry: textbook / S. P. Nazarbekova, A. Tukibayeva, U. Nazarbek. - Almaty : Association of higher educational institutions of Kazakhstan, 2016. - 304 p.

6. Shokybayev, Sh. A. Teaching methods on chemistry: textbook / Sh. A. Shokybayev, Z. O. Onerbayeva, G. U. Ilyassova. - Almaty : [s. n.], 2016. - 271 p.

7. Manapov, N. T. Computer chemistry: textbook / N. T. Manapov. - Almaty : Association of higher educational institutions of Kazakhstan, 2016. - 312 p.

1. Department: "Hygiene and epidemiology"

2. Level of preparation (bachelor)

3. Speciality: 6B10117- "Pediatria "

4. Course: 3

5. Name of elective discipline: "General hygiene"

6. The number of credits - 4

7. Purpose: the formation of hygienic thinking necessary for the medical worker in future professional activities.

8. Tasks:

- teach how to apply hygienic knowledge for the prevention of diseases, preservation and strengthening of health in healthy people;

- teach to apply hygienic knowledge and skills to improve hygienic literacy of the population.

9. Justification of the choice of discipline: General hygiene is one of the fundamental disciplines of basic medical education. Teaching theoretical and practical courses aimed at studying the fundamental principles of public health. The discipline reflects the patterns of influence of environmental factors on the human body and public health in order to substantiate hygienic standards, health regulations, and measures, the implementation of which will ensure the preservation and strengthening of people's health.

10. Learning outcomes (competencies):

<u>Knowledge (cognitive sphere)</u>	<u>Skills and abilities (psychomotor sphere)</u>	<u>Personal and professional competencies (relationships)</u>
• knows the hygienic value of air. Measures for the prevention of diseases associated with the impact on the human body of physical properties, natural chemical and biological composition and air pollution; • knows the role of water factor and soil in the occurrence and spread of infectious and non-infectious diseases and hygienic measures for their prevention; • knows the hygienic basics of the rational nutrition of various groups of the population, methods for assessing the nutritional value • knows the hygienic value of basic foods. Food poisoning and their prevention; • knows the hygienic characteristics of the most common harmful factors of the labor process and the working	• interprets the results of the air quality study; • assesses the role of water factor in the development of infectious and non-communicable diseases and take measures for their prevention; • assesses the organization and nutritional value; • assesses the risk of exposure to occupational hazards on the human body; • evaluates the working conditions and the sanitary condition of the work premises; • assesses the physical development of children and adolescents; • evaluates the sanitary and epidemiological regime of hospitals;	perceive new ideas; - demonstrate relevant communication skills in the field of hygienic science; - observe the principles of medical ethics when dealing with the public; - master teamwork and leadership skills.

environment in industrial plants. Preventive and health measures at work; • knows the hygienic requirements for hospitals; knows the hygienic basis for the prevention of nosocomial infections.	• implement measures to prevent nosocomial infections; • makes a menu-layouts of dishes according to diets.	
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11. Prerequisites: molecular biology and medical genetics, basic physiology.

12. Post requisites: clinical epidemiology, introduction to the clinic.

13. Literature:

1. Bolshakov, A. M. Zhalpa hygiene: - M.: GEOTAR - Media, 2014 y.

2. Hygiene: textbook / M-in education and science of the Russian Federation; by ed. P. I. Melnichenko. -: Rec. GBOU VPO "First Mosk. State Medical University. I.M. Sechenov ". - M.: GEOTAR - Media, 2014. - 656 p.

3. Tokanova, Sh. E. Zhalpy hygiene: Оқу құралы - Almaty: Evero, 2013

4. Torgautov, B.K. Zhalpy hygiene: / B.K. Torgautov, M. Sh. Seralieva. - Shymkent: "Nyrdana - LTD", 2011. - 432 page with. -

5. Torgautov, B.K. Zhalpy hygiene: / B.K. Torgautov, M. Sh. Seralieva. - Shymkent: B. Well., 2009. - 428 page. with.

1. Department of Obstetrics and Gynecology

2. Level of training – Bachelor

3. Educational program – 6B10102 «Pediatrics»

4. Course – 4

5. Name of elective discipline-Obstetrics

6. Number of credits-5, number of hours – 150.

7. Goal: Obstetrics is a fundamental branch of clinical medicine. Protection of reproductive health, management of pregnancy, childbirth and the postpartum period is the main task of this discipline. A qualitative indicator of the work of any maternity service is the reduction of maternal and perinatal morbidity and mortality. In the diagnosis and treatment of obstetric complications at the present stage, it requires the mandatory use of clinical protocols in this specialty. Competencies in this area are mandatory for a graduate of the Faculty of General Medicine, who must know the clinical and physiological characteristics of the female body in different age periods, be able to carry out not only therapeutic and diagnostic, but also preventive measures of physiological and pathological obstetrics.

8. Tasks:

1. To give students up-to-date knowledge about the main manifestations of the most common obstetric conditions and gynecological pathologies;
2. Teach them to provide emergency care for the most common obstetric conditions and gynecological diseases, to make an observation plan, to provide the necessary care to the patient;
3. Teach to observe and control sanitary, hygienic, and anti-epidemic regimes in obstetric and gynecological institutions in accordance with regulatory documents;
4. Teach to train (advise) patients and family on family planning and contraception issues;
5. Teach to provide pre-medical care for emergency conditions in obstetrics and gynecology.

9. The content of the discipline: Formation of knowledge, skills and abilities in the diagnosis and management of pregnancy, childbirth and the postpartum period, primary health care and prevention of common obstetric pathology, training in the basics of practical skills of normal and pathological obstetrics and perinatology.

10. Justification: Organization of women's health protection in the Republic of Kazakhstan. Help in emergencies should be a doctor of any specialty, this is especially important in obstetrics, where

the life of the mother and fetus depends on the speed and skill of the doctor. Treatment of diseases, taking into account the obstetric and gynecological status in the presence of concomitant obstetric pathology; emergency care for pregnant women, women in labor, women in labor.

The role of the doctor in the prevention of diseases in women, the influence of the course of pregnancy and childbirth. Infection in the development of purulent-septic complications in pregnant women and postpartum women. Critical periods of pregnancy, stages of development of the embryo/fetus; changes that occur in the body of a woman during pregnancy. Complicated course of pregnancy (early toxicosis, gestosis, anemia, infection)

11. Learning outcomes (competencies)

1) Knowledge and understanding:

- demonstrates knowledge of the subject and tasks of obstetrics and gynecology;

2) Applying knowledge and understanding

- knows the methods of research and primary care in obstetrics and gynecology;
- has the skills of medical examination and prevention of pathology in obstetrics and gynecology;

3) Formation of judgments

- uses the acquired knowledge to understand the features of etiopathogenesis, clinic, complications and extragenital diseases during pregnancy;
- applies the theoretical knowledge gained in midwifery for further study at the internship level;

4) Communication skills

- demonstrates communication skills when interacting with different people in different obstetric situations;
- demonstrates professional behavior – responsibility, productivity, self-esteem, reflection;

5) Learning skills or learning abilities

- demonstrates readiness and ability to acquire new knowledge;

12. Prerequisites: Anatomy, physiology, and pathology.

13. Post-requirements: Nursing care in obstetrics and gynecology

14. Literature

basic:

1. Bodyazhina I. I. Obstetrics: textbook 1,2,3 Vol.- Evero, 2015

2. management of Obstetrics and gynecology for paramedics and obstetricians: Ed. V. N. Prilepsky, V. E. Radzinsky. Moscow, 2007. - 688 P.

3. Radzinsky V. E. Obstetrics: textbook + CD. Moscow, 2008-904 P.

4. Gynecology: textbook /L. N. Vasilevskaya [and doctor].] 6-E izd. - Rostov B/D, 2007

additional:

1. urgent assistance in obstetrics and gynecology: management / Ed. "What's The Matter?" - 2nd ed., ISPR. and the ball. Moscow: GEOTAR-media, 2011.

2. Kailyubayeva G. zh. physiology of pregnancy. Dorodovoy care : educational and methodological support / G. zh. Kailyubayeva, G. N. Baimusanova; MZ RK-2-OE izdaniye-Karaganda: AKNUR, 2019. - 132 H

1. Department of Obstetrics and Gynecology

2. Level of training-Bachelor

3. Educational program-6B10102 «Pediatrics»

4. Course – 4, number of credits-5, number of hours-150.

5. Name of elective discipline- Pediatric gynecology

Goal:

Formation of competencies for the diagnosis and management of patients with gynecological diseases, provision of primary medical care and prevention of common gynecological pathologies, training in the basics of practical skills used in gynecology. To improve the

communication skills of interpersonal communication and counseling of patients with gynecological pathology.

The content of the discipline:

Neuroendocrine regulation of the menstrual cycle. Methods of examination of a gynecological patient with an assessment of the specific functions of the female reproductive system and the functions of organs related to sexual organs in anatomical and functional relations. Functional diagnostic tests. Screening methods. Classification, clinic, modern methods of diagnosis and principles of treatment of gynecological diseases.

Tasks:

1. To give students up-to-date knowledge about the main manifestations of the most common obstetric conditions and gynecological pathologies;
2. Teach them to provide emergency care for the most common obstetric conditions and gynecological diseases, to make an observation plan, to provide the necessary care to the patient;
3. Teach to observe and control sanitary and hygienic and anti-epidemic regimes in obstetric and gynecological institutions in accordance with regulatory documents;
4. Teach to train (advise) patients and family on family planning and contraception issues;
5. Teach to provide pre-medical care for emergency conditions in obstetrics and gynecology.

Justification:

Organization of women's health protection in the Republic of Kazakhstan. Formation of competencies for the diagnosis and management of patients with gynecological diseases, provision of primary medical care and prevention of common gynecological pathologies, training in the basics of practical skills used in gynecology. To improve the communication skills of interpersonal communication and counseling of patients with gynecological pathology.

Learning outcomes (competencies)

- 1) Knowledge and understanding:
 - demonstrates knowledge of the subject and tasks of obstetrics and gynecology;
- 2) Applying knowledge and understanding
 - knows the methods of research and primary care in obstetrics and gynecology;
 - has the skills of medical examination and prevention of pathology in obstetrics and gynecology;
- 3) Formation of judgments
 - uses the acquired knowledge to understand the features of etiopathogenesis, clinic, complications and extragenital diseases during pregnancy;
 - applies the theoretical knowledge gained in midwifery for further study at the internship level;
- 4) Communication skills
 - demonstrates communication skills when interacting with different people in different obstetric situations;
 - demonstrates professional behavior – responsibility, productivity, self-esteem, reflection;
- 5) Learning skills or learning abilities
 - demonstrates readiness and ability to acquire new knowledge;

Prerequisites: Anatomy, physiology, and pathology.

Postrequirements: Nursing care in obstetrics and gynecology

Literature

basic:

1. Bodyazhina I. I. Obstetrics: textbook 1,2,3 Vol.- Evero, 2015

2. management of Obstetrics and gynecology for paramedics and obstetricians: Ed. V. N. Prilepsky, V. E. Radzinsky. Moscow, 2007. - 688 P.
 3. Radzinsky V. E. Obstetrics: textbook + CD. Moscow, 2008-904 P.
 4. Gynecology: textbook /L. N. Vasilevskaya [and doctor].] 6-E izd. - Rostov B/D, 2007
 additional:

1. urgent assistance in obstetrics and gynecology: management / Ed. "What's The Matter?" - 2nd ed., ISPR. and the ball. Moscow: GEOTAR-media, 2011.
 2. Kailyubayeva G. zh. physiology of pregnancy. Dorodovoy care : educational and methodological support / G. zh. Kailyubayeva, G. N. Baimusanova; MZ RK-2-OE izdaniye- Karaganda: AKNUR, 2019. - 132 H

1. Department: Public Health and Healthcare

2. Level of training: Bachelor's degree

3. Educational program: 6B10116 Pediatrics

4. Course: 5

5. Name of elective discipline: Digital Medicine and Artificial Intelligence

6. Number of credits: 4

7. Objective: To provide students with a systematic understanding of the principles of digital transformation in healthcare, the possibilities and limitations of applying artificial intelligence technologies in medical practice, and to develop skills in analyzing, interpreting, and using digital medical data to improve the quality of diagnosis, treatment, and management of medical processes.

8. Course content: □ Study the basic concepts, directions, and trends in the development of digital medicine and artificial intelligence technologies in healthcare.

□ Familiarize students with modern digital medical technologies, electronic healthcare systems, and medical information systems.

□ Form an understanding of the principles of artificial intelligence algorithms and their application in the diagnosis, treatment, and prognosis of diseases.

□ Develop skills in analyzing and interpreting medical data obtained from digital sources

9. Course Objectives: (30–50 words)

. To develop knowledge and skills in digital technologies in medicine and healthcare, as well as in modern software and hardware tools for processing medical information. To develop skills in using information flows in the professional activities of physicians, in telemedicine services, in artificial intelligence for diagnostics, in verifying prescriptions for medicines, and in accessing resources and medical data.

10. Reasons for choosing this discipline: The rapid development of digital technologies and artificial intelligence is leading to a significant transformation of the healthcare system. Electronic medical records, telemedicine technologies, clinical decision support systems, medical image analysis algorithms, and large medical data sets are being actively introduced into medical practice. In this regard, modern healthcare professionals need to have knowledge of the principles of digital medical systems and the possibilities of applying artificial intelligence in the diagnosis, treatment, and prevention of diseases.

11. Learning outcomes: ((4–6 learning outcomes in accordance with the Dublin Descriptors)).

LO 1. Explains the basic concepts, principles, and directions of development of digital medicine and artificial intelligence technologies, as well as their role in the modern healthcare system.

LO 2. Applies the basic principles of digital medical technologies and artificial intelligence tools in the analysis of medical information and the solution of professional tasks.

LO 3. Analyzes the possibilities, limitations, and effectiveness of using digital technologies and artificial intelligence systems in diagnosis, treatment, and medical data management, taking into account ethical and legal aspects.

RO 4. Presents and discusses information on the application of digital technologies and artificial intelligence in medicine with professional and non-professional communities, using scientific and professional terminology.

PO 5. Demonstrates readiness to independently master and use new digital technologies and artificial intelligence tools in professional activities and further training.

12. Prerequisites: Public Health and Fundamentals of Evidence-Based Medicine

13. Postrequisites: Master's Degree.

14. Literature: Main:

Daris Kesheni. Information technologies in public health: Daris Kesheni. - Shymkent: OKMA, 2023. - 14 p. Sadibekova, Zh. U. Akparattyk tehnologiya lar zhane tsifirlyk densauylyk saktau: oqy kuraly / Zh. U. Sadibekova. - 2nd ed. - Shymkent: OKMA, 2024. - 153 p.

Fundamentals of Telemedicine and Telehealth: A Guide for Physicians / Edited by A. V. Dreval, E. P. Kakorina. - Moscow: GEOTAR-Media, 2021. - 136 p.

Telemedicine technologies in the healthcare system: monograph / I. A. Samchenko [et al.]; Ministry of Health of the Republic of Kazakhstan; Educational and Methodological Association of Medical Universities of the Republic of Kazakhstan; South Kazakhstan Medical Academy. - Shymkent-Odessa: B. and I., 2008. - 366 p.

Lisitsyn, Yu. P. Public health and healthcare: textbook / Yu. P. Lisitsyn, G. E. Ulumbekova. - 3rd ed., rev. and supp. ; Ministry of Education and Science of the Russian Federation. Rec. by the First State Medical University named after I. M. Sechenov. - Moscow: GEOTAR-Media, 2015. - 544 p.

Nurpeisova T.B. Information and communication technology: Textbook / T. B. Nurpeisova, I. N. Kaidash. - [no place]: Bastau, 2017. - 480 p. Translation of title: Information and communication technologies.

Additional:

Boleshev, M. A. Public Health and Health Care [Text]: textbook / M. A. Boleshev. - Almaty: Evero, 2015. - 244 p.

Akanov, A. Population Health and Care of the Republic of Kazakhstan [Text] = Population Health and Care of the Republic of Kazakhstan (White Paper) : monograph / A. Akanov, T. Meimanaliyev. - ; Recommended for publication by the Academic Council of the S. D. Asfendiyarov Kazakh National Medical University. - Almaty: Evero, 2014. - 80 p.

Electronic resources:

Public Health and Healthcare [Electronic resource]: textbook / Yu. P. Lisitsyn, G. E. Ulumbekova. - 3rd ed., rev. and supp. - Electronic text data (43.1 MB). - Moscow: GEOTAR-Media, 2017. - Electronic optical disc (CD-ROM). - 15523.00 Tenge.

Public Health and Healthcare [Electronic resource]: textbook / V. A. Medik, V. K. Yuryev. - Electronic text data (47.6 MB). - Moscow: GEOTAR-Media, 2013. - 608 p. electronic optical disc (CD-ROM): ill. - (Electronic textbook). - ISBN 978-5-9704-2377-6: 4800.00 Tenge.

Gusmanova L.K. / Densauylyk ty nighaytu: oqy quraly. Karagandy: Medet Group JSC, 2024. – 262 p. / <https://aknurpress.kz/reader/web/2600>

Maintaining public health. Sarsenbayeva G.Zh., 2019 <https://www.aknurpress.kz/reader/web/1362>
Zhaheeva, M.B., Bekmagambetov, O.A. Factors of innovative development in healthcare. // Nauka. , 2015. - No. 1. - P.200-202./ <https://rmebrk.kz/book/1153746>

Boleshev, Myrzatay Abildayevich. Public Health and Health Care [Text]: textbook / M. A. Boleshev. -Almaty: Evero, 2016. - 242 p. / <https://elib.kaznu.kz/book/9117>

Mukhambekov M.M. Management of Health Maintenance: Textbook / M.M. Mukhambekov - Almaty: Evero Publishing House, 2020. - 348 p. https://www.elib.kz/ru/search/read_book/626/

Boleshev, M.A. Public Health and Healthcare: A Textbook / M.A. Boleshev. - Almaty: Evero, 2020. - 244 pages. / https://www.elib.kz/ru/search/read_book/674/

Polyakov, M. V. Data Mining in Medicine : a textbook / M. V. Polyakov. — Almaty, Moscow : EDP Hub (Idipi Hub), IPR Media, 2024. // IPR SMART digital educational resource : [website]. — URL: <https://www.iprbookshop.ru/135262.html>

Kudaeva, F. Kh. Information Technologies in Professional Activity and Artificial Intelligence : textbook. — Nalchik : Kabardino-Balkarian State University named after Kh. M. Berbekov, 2023. // IPR SMART digital educational resource : [website]. — URL: <https://www.iprbookshop.ru/146732.html>

Kokorin, V. N. Digital twins of the human biosystem as a mechanism of artificial intelligence in healthcare / V. N. Kokorin. — Ulyanovsk: Ulyanovsk State Technical University, 2023. // Digital educational resource IPR SMART: [website]. — URL: <https://www.iprbookshop.ru/149310.html>

Zolkin, A. L. Implementation of the principles of organization and use of machine learning and artificial intelligence in medicine: textbook / A. L. Zolkin, V. D. Munister. — Samara: REAVIZ,

2024. — 124 p. // Digital educational resource IPR SMART: [website]. — URL: <https://www.iprbookshop.ru/153813.html>

Daniel W. Byrne. Artificial Intelligence for Improved Patient Outcomes: Principles for Moving Forward with Rigorous Science. Philadelphia: Wolters Kluwer Health. 2023 // eBook Collection EBSCO