

## Hand book on the program module for bachelors of the educational program "6B05107-Biology"

This guide provides information on the modules and disciplines of the study program.

<i>Module designation</i>	<i>General education module</i> <i>Discipline - <b>HISTORY OF KAZAKHSTAN</b></i>
<i>Semester(s) in which the module is taught</i>	<i>Autumn and spring semesters of the first year of studies</i>
<i>Person responsible for the module</i>	<i>Ganizhamal Kushenova</i>
<i>Language</i>	<i>Kazakh, Russian, English</i>
<i>Relation to curriculum</i>	<i>For all bachelor programs, compulsory component, general education discipline, 1-2 semester of the first year of students</i>
<i>Teaching methods</i>	<i>lecture, seminar, self-study</i>
<i>Workload (incl. contact hours, self-study hours)</i>	<i>30 hours of lectures, 15 hours of seminars, 105 hours of students' self-study including examination preparation</i>
<i>Credit points</i>	<i>5</i>
<i>Required and recommended prerequisites for joining the module</i>	<i>-</i>
<i>Module objectives/intended learning outcomes</i>	<p><i>The purpose of the course „Modern history of Kazakhstan“ is to form a system of scientific views on the history of modern Kazakhstani society in the context of the world historical process. Students know the main periods of the formation of an independent Kazakhstani statehood, phenomena and events of the historical past with the general paradigm of the world-historical development of human society through critical analysis. Students know how to use the techniques of historical description and analysis of the causes and consequences of events in the modern history of Kazakhstan, to analyze the features and significance of the modern Kazakhstani model of development, to determine the practical potential of intercultural dialogue and respect for the spiritual heritage.</i></p> <p><i>Students are able to propose possible solutions to modern problems based on an analysis of the historical past and reasoned information, to form their own civic position on the priorities of mutual understanding, tolerance and democratic values of modern society.</i></p>
<i>Content</i>	<ol style="list-style-type: none"> <li><i>1. Introduction to the course</i></li> <li><i>2. Kazakhstan on the way to independence: stages of formation of the idea of a national state</i></li> <li><i>3. Civil-political confrontation</i></li> <li><i>4. Implementation of the Soviet model of nation-building</i></li> <li><i>5. Contradictions and consequences of the Soviet reforms in Kazakhstan in the second half of the twentieth century</i></li> <li><i>6. «Perestroika» policy in Kazakhstan</i></li> <li><i>7. Formation of the state structure of the Republic of Kazakhstan.</i></li> <li><i>8. Kazakhstani model of economic development</i></li> <li><i>9. Social modernization – the basis for the well-being of society</i></li> <li><i>10. Ethno-demographic processes and strengthening of interethnic harmony</i></li> <li><i>11. Socio-political development prospects and spiritual modernization.</i></li> <li><i>12. The policy of forming a new historical consciousness and worldview of the people of the Great Steppe</i></li> <li><i>13. Kazakhstan – a state recognized by the modern world</i></li> <li><i>14. N.A. Nazarbayev – a personality in history</i></li> <li><i>15. Formation of the nation of a united future</i></li> </ol>
<i>Exams and assessment formats</i>	<i>one final oral exam (30 minutes)</i>

Study and examination requirements	Students must have a final grade of 50% or higher to pass
Reading list	<p style="text-align: center;"><b>Basic references</b></p> <ol style="list-style-type: none"> <li>1. Ayagan B.G., Abzhanov Kh.M., Seliverstov S.V., Bekenova M.S. <i>Sovremennaya istoriya Kazakhstana</i>: Almaty: Raritet, 2010. – 432 s., 16 s.</li> <li>2. Kan G.V. <i>Istoriya Kazakhstana: Uchebnoye posobiye dlya vuzov</i>. – Almaty, 2005.</li> <li>3. <i>Uly Dala tarikhy: uchebnoye posobiye</i> / Kan G.V., Tugzhanov Ye.L. – Astana: Zhasyl Orda, 2015. – 328 str.</li> <li>4. Momynova Sh.R. <i>Kazakhstan: drevneyshaya, drevnyaya i srednevekovaya istoriya. V 2 tomakh</i>. - Karaganda, 2003</li> </ol> <p style="text-align: center;"><b>Additional references</b></p> <ol style="list-style-type: none"> <li>1. Nazarbayev N.A. «7 graney Velikoy stepi». – Astana, 2018</li> <li>2. Nazarbayev N.A. «Era nezavisimosti». – Astana, 2017</li> <li>3. <i>Kazakstan tarikhy. 5 tom dyk. 1-5-tomdar</i>. – Almaty., 1996, 1997, 2000, 2010.</li> <li>4. <i>Kazakstan (Kazak Yeli) tarikhy</i>. – 4 kytaptan turatyn okulyk. <i>Tauelsiz Kazakstan: algyzharttary zhane kalyptasuy. 4 kytap</i> / T. Omarbekov, B.S. Saylan, A.Sh. Altayev zhane t.b. – Almaty, Kazak university, 2016. – 264 b.</li> <li>5. Alan Barnard <i>Antropologiya tarikhy men teoriyasy [okulyk]</i> / A. Barnard; aud. Zh. Zhumashova, 2018. – 240 b.</li> <li>6. Shvab K. <i>Tortinshi industriyalyk revolyuciya [monografiya]</i> / K. Shvab; aud.: N.B. Akysh, L.A. Bimendiyeva, K.I. Matyzhanov, 2018. – 198 b.</li> <li>7. Nazarbayev N.A. <i>Tarikh tolkynynda</i>. – Almaty: Atamura, 1999</li> <li>8. Kan G.V. <i>Istoriya Kazakhstana: Uchebnoye posobiye dlya vuzov</i>. – Almaty, 2005.</li> <li>9. <i>Uly Dala Tarikhy: uchebnoye posobiye</i> / Kan G.V., Tugzhanov Ye.L. – Astana: Zhasyl Orda, 2015. – 328 s.</li> <li>10. Ayagan B.G., Abzhanov Kh.M., Makhat D.A. <i>Kazirgi Kazakstan tarikhy</i>. – Almaty, 2010.</li> </ol>

### A Module Handbook

Module name	General education module
Module level (if available)	-
Code (if available)	EDUC 21001
Subtitle (if available)	-
Course (if available)	Foreign language
Semester	1/2 semesters
Person responsible for the module	Ustelimova N.A., Musina S.K., Burkitbayeva A.G.
Lecturer	Russian / Kazakh Ustelimova N.A., Musina S.K., Burkitbayeva A.G., Zhussupova G.M., Khamitova A.G., Kassenova A.B., Zhanayeva Zh.A., Zhandildinova A.M., Nurlybay A.M., Nurgaliyeva U.S., Zagorulya O.L., Vatutina Zh.P., Dyusengaliyeva A.A.
Language of instruction	English / French / German
Within the curriculum	General education course
Teaching type, contact hours	Practical classes – 90 hours
Hours	45 practical classes / 105 SIW (students' independent work)
ECTS number	5
Exam requirements	Oral exam
Pre-requisites	Foreign language

Module objectives / intended learning outcomes	<p><i>The learning outcomes in the course “Foreign Language”:</i></p> <ul style="list-style-type: none"> <li>- the student owns the language system at the level of common European competence and methods of its use in cultural and communicative activities;</li> <li>- in the course of a dialogue and monologue, the student knows how to hold the attention of a partner, describes situations and events with refraction through their own experience of perception;</li> <li>- in the course of written communication, the student writes short essays on topics of interest, short reports with factual information of a daily nature and an explanation of the necessary actions;</li> <li>- in the course of listening the student understands simple information messages on radio and television on topics of interest;</li> <li>- in the course of reading, the student looks through texts in order to find necessary information, establishes the logic of reasoning on the topic of the text, and understands simple texts with factual information (traditional and online).</li> </ul> <p><i>In the process of foreign language education, students develop intercultural and communicative competencies in the traditional and online formats.</i></p>
Content	<ol style="list-style-type: none"> <li>1) Social sphere of communication: Family in the modern society</li> <li>2) Socio-cultural sphere of communication: /Entertainment</li> <li>3) Socio-cultural sphere of communication / Looking after yourself</li> <li>4) Socio-cultural sphere of communication: Cultural and historical background</li> <li>5) Socio-cultural sphere of communication: Cultural and historical background</li> <li>6) Socio-cultural sphere of communication: Cultural and historical background /Personal, private life</li> <li>7) Socio-cultural sphere of communication/Culture</li> <li>8) Educational of communication sphere/The world</li> <li>9) Educational of communication sphere/Student's life</li> <li>10) Socio-cultural sphere of communication: Cultural and historical background/Education</li> <li>11) Professional sphere of communication (the title of the topic depends on the specialty)</li> <li>12) Professional sphere of communication (the title of the topic depends on the specialty)</li> <li>13)Professional sphere of communication (the title of the topic depends on the specialty)</li> <li>14) Professional sphere of communication (the title of the topic depends on the specialty)</li> <li>15) Professional sphere of communication (the title of the topic depends on the specialty)</li> </ol>
Requirements for training and exams, exam forms	<p><i>Students are required to attend practical classes in a foreign language and take an active part in completing SIW assignments, the results of which are accepted by the teacher online or in the university classroom, depending on the type and form of the assignment. Students who have missed classes, receive the “absent” mark in the electronic mark-book in the AIS “Platonus”. If the lesson is missed for a grounded reason, the student has the right to answer the missed topics to the teacher.</i></p> <p><i>The first midterm assessment: Performing test tasks on the studied material / oral statement on the covered topics, at the discretion of the teacher.</i></p> <p><i>The second midterm assessment: Fulfillment of test tasks on the studied material / oral statement on the covered topics, at the discretion of the teacher.</i></p>
Media used	<i>Edpuzzle, Kahoot, Socrative, Edmodo</i>

References	<p>1. Latham-Koenig Ch., Oxenden C. <i>English File. Pre/Inter/Upper-Intermediate Student's Book</i>. – 3d ed. – Oxford: Oxford University Press, 2014</p> <p>2. Sagimbayeva D.E., Mukhtarkhanova A.M., Tazhitova G.Z. <i>From reading to speaking</i>. – Stana, 2016.</p> <p>3. Murphy Raymond. <i>Essential Grammar in Use</i>.- 3d ed., 16th print. – Cambridge University Press, 2013. – 319 p.</p> <p>4. Nurbekova Zh.K., Zharkynbekova Sh.K., Sagimbayeva D.E., Mukhtarkhanova A.M. <i>Inostranny yazyk: angliyskiy yazyk [elektronnyy resurs]: Tsifrovyye obrazovatel'nyye resursy dlya vseh neyazykovykh spetsial'nostey 1 kursa</i>. MON RK, YENU im. L.N.Gumileva. – Astana: YENU im.L.N. Gumileva, 2015. – 1 elektronnyy disk (CD); TSOR</p> <p>5. UMKD po distsipline "Inostranny yazyk I, II» dlya obuchayushchikhsya neyazykovykh spetsial'nostey. Uroven' bazovoy standartnosti B1, V2. 2019 g.Yevraziyskiy natsional'nyy universitet im. L.N. Gumileva Rabochaya (modul'naya) uchebnaya programma (Syllabus) Izdaniye: pervoye F YENU 703-13-17 Rabochaya (modul'naya) uchebnaya programma (Syllabus). Izdaniye pervoye.</p> <p>6. Murphy, R. <i>English Grammar in Use. A reference and practice book for intermediate / upper intermediate students of English</i> / Raymond Murphy. - 4th ed.- Cambridge: Cambridge University Press, 2012.</p> <p><b>E-resources:</b>  Data bases: <a href="https://library.enu.kz/MegaPro/Web">https://library.enu.kz/MegaPro/Web</a>  <a href="https://edpuzzle.com/">https://edpuzzle.com/</a>  <a href="https://learnenglish.britishcouncil.org/skills/listening/intermediate-b1">https://learnenglish.britishcouncil.org/skills/listening/intermediate-b1</a>  <a href="https://www.britishcouncil.kz/kk">https://www.britishcouncil.kz/kk</a>  <a href="https://www.macmillanyounglearners.com/macmillanenglish/">https://www.macmillanyounglearners.com/macmillanenglish/</a>  <a href="https://learnenglish.britishcouncil.org/">https://learnenglish.britishcouncil.org/</a>  <a href="https://create.kahoot.it/auth/login">https://create.kahoot.it/auth/login</a></p>
Module designation	<p>General Education Module</p> <p>Discipline-Kazakh (Russian) language</p>
Semester(s) in which the module is taught	Autumn and spring semesters of the first year of studies
Person responsible for the module	Kulmanov K.S (Kazakh language) Zhuravleva Y.A (Russian language)
Language	Kazakh (Russian) language
Relation to curriculum	Compulsory
Teaching methods	<p>Practical classes</p> <p>Students' independent work</p>
Workload (incl. contact hours, self-study hours)	<p>Contact hours – 3 hours a week</p> <p>Practical classes – 90 contact hours (45 contact hours + 45 contact hours)</p> <p>SIW (students' independent work) – 210 (105+105)</p> <p>Number of students in a group – 12-15</p>
Credit points	5 ECTS (1-2 semesters)
Required and recommended prerequisites for joining the module	To master this course (level B2), students must have a level of proficiency and skills in the course "Kazakh / Russian language" equivalent to the level of secondary education (A1, A2, B1).

<i>Module objectives/intended learning outcomes</i>	<p><i>Purpose: To acquire students with grammar of the Kazakh/Russian languages, to teach the correct use of grammar and literacy skills; to express your own opinion freely and to write in Kazakh/Russian accurately;</i></p> <p><i>Learning outcomes:</i></p> <p><i>Learning outcome 1 – to enter into communication in oral and written forms in Kazakh, Russian and foreign languages to solve the problems of interpersonal, intercultural and professional communication;</i></p> <p><i>Learning outcome 2 – building a speech behavior program in situations of personal, social and professional communication in accordance with the norms of language, culture, the specifics of the sphere of communication, certification requirements.</i></p> <p><i>To know the rules of grammar of Kazakh/Russian languages</i></p> <p><i>To be able to use topics in speaking situations (texts, dialogues, disputes etc.)</i></p> <p><i>To have an ability to use the Kazakh/Russian languages in everyday speech correctly</i></p>
<i>Content</i>	<ul style="list-style-type: none"> <li>- <i>My life</i></li> <li>- <i>Geography</i></li> <li>- <i>Education</i></li> <li>- <i>Environment</i></li> <li>- <i>Books</i></li> <li>- <i>Traditions and holidays</i></li> <li>- <i>Professions</i></li> <li>- <i>Mass media</i></li> <li>- <i>Society</i></li> <li>- <i>Science</i></li> <li>- <i>Sport</i></li> </ul> <p><i>Leisure</i></p>
<i>Exams and assessment formats</i>	<p><i>Two oral Midterm assessments (20 minutes each) and one final oral exam (40 minutes), test</i></p> <p><i>Exam form: combined (testing in Socrativ, oral answer, written assignment)</i></p>
<i>Study and examination requirements</i>	<p><i>The combined exam consists of 25 exam cards with two questions. The first question is taking a test in the SOCRATIV program, where students solve 40 questions; the second question is an oral answer to a given topic. The list of topics for oral answers is given to students in advance for preparation. The third question is reading a text and answering questions about the text in writing.</i></p>

Reading list	<ol style="list-style-type: none"> <li>1. Kazakhskiy yazyk: Kazak tili: Kulmanov K.S., Abduova B.S., Akbuzauova B., Akhmetova K.A., Baibolat L.B. Kazak tili (Til uyrenushilerdyn B1 zhane B2 dengeylerine arналған). Oku kuraly (Yekinshi basylym), Astana, 2016.</li> <li>2. Kulmanov K.S., Abduova B.S., Akbuzauova B., Akhmetova K.A., Baibolat L.B. Kazak tili (Til uyrenushilerdyn B1 zhane B2 dengeylerine arналған). Oku kuraly (Yekinshi basylym), Astana, 2015.</li> <li>3. Alimbek G. Kazak tili B1,B2 dengeyleri boyynsha oku-adistemelik kural. – Nur-Sultan, 2021. – 194 bet.</li> <li>4. Kulmanov K.S., Adilbek A.M., Mazgumbekova A.K., Khamitova A.G. Kazak tili (A1 engeyi. Sheteldik studentterge arналған Oku kuraly– Nur-Sultan, 2021. – 176 bet.</li> <li>5. Russkiy yazyk: uchebnoye posobiye dlya studentov kazakhskikh otdeleniy universitetov (bakalavriat) / pod redaktsiyey K.K. Akhmed'yarova, SH.K. Zharkynbekovoy. – 4-ye izd. – Almaty: Evero, 2016. – 241 c.//<a href="https://scicenter.online/yazyik-russkiy-scicenter/russkiy-yazyik-uchebnoe-posobie-dlya-studentov.html">https://scicenter.online/yazyik-russkiy-scicenter/russkiy-yazyik-uchebnoe-posobie-dlya-studentov.html</a></li> <li>6. Zhuravleva Ye.A., Asmagambetova B.M., Tashimkhanova D.S., Yavorskaya E.E., Te M.V., Yeshekeneva A.K. «Professional'nyy russkiy yazyk»: uchebno-metodicheskoye posobiye / Pod obshchey redaktsiyey Ye.A. Zhuravlevoy.– Almaty: Izdatel'stvo «Evero», 2019. – 242 s.// <a href="http://library.psu.kz/fulltext/transactions/4864_juravleva_e.a.asmagambetova_b.m.tashimkhanova_d.s.yavorskaya_e.e.te_m.v.eshekeneva_a.k.professionalniy_russkiy_yazyk_e.a.juravleva_i.dr..-almati_evero.pdf">http://library.psu.kz/fulltext/transactions/4864_juravleva_e.a.asmagambetova_b.m.tashimkhanova_d.s.yavorskaya_e.e.te_m.v.eshekeneva_a.k.professionalniy_russkiy_yazyk_e.a.juravleva_i.dr..-almati_evero.pdf</a></li> </ol> <p>Electronic library systems for remote access:  <a href="https://lib.enu.kz/?q=ru/node/768">https://lib.enu.kz/?q=ru/node/768</a> - Scientific library of L.N. Gumilyov ENU  <a href="http://e.lanbook.com/">http://e.lanbook.com/</a> - “Lan” Publishing House  <a href="http://www.Znaniy.com">http://www.Znaniy.com</a> – “Knowledge” electronic library  <a href="https://biblioclub.ru">https://biblioclub.ru</a> – “University Library Online” ELS  <a href="https://www.biblioschool.ru/">https://www.biblioschool.ru/</a> – “BIBLIOSHKOLA” ELS  <a href="http://www.studentlibrary.ru/">http://www.studentlibrary.ru/</a> – “Konsul'tant studenta” ELS  <a href="http://www.iprbookshop.ru/3163.html">http://www.iprbookshop.ru/3163.html</a>. – “IPRbooks” ELS  Справочно-информационный интернет-портал - <a href="http://www.grammar.ru">www.grammar.ru</a>  Справочно-информационный интернет-портал- <a href="http://www.dic.academic.ru">www.dic.academic.ru</a>  Справочно-информационный интернет-портал - <a href="http://www.slovari.yandex.ru">www.slovari.yandex.ru</a>  Справочно-информационный портал -<a href="http://www.doc-style.ru">www.doc-style.ru</a>  <a href="http://www.ruscorpora.ru">www.ruscorpora.ru</a>  <a href="http://www.ruslit.ioso.ru">www.ruslit.ioso.ru</a> <a href="http://www.ruspismo.net">www.ruspismo.net</a>  <a href="http://www.russian-world.info/kultura-rechi">www.russian-world.info/kultura-rechi</a>  <a href="http://www.slovari.ru">www.slovari.ru</a></p>
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## A Module Handbook

<i>Module designation</i>	<i>Social and Political Knowledge Module</i>
<i>Semester(s) in which the module is taught</i>	<i>Semester 1 and semester 2 of the first year of studies</i>
<i>Person responsible for the module</i>	<i>in Kazakh – Yermagambetova K.S., Ramazanova A.Ch., Atymtayev A.S. in Russian – Sandybayeva U.M., Arystambayeva S.A. in English – Umbetova G.T., Abdibek A.</i>
<i>Language</i>	<i>Kazakh, Russian, English</i>
<i>Relation to curriculum</i>	<i>General education course</i>
<i>Teaching methods</i>	<i>lecture, seminar</i>
<i>Workload (incl. contact hours, self-study hours)</i>	<i>7 hours of lectures, 15 hours of seminars, 38 hours of SIW (students' independent work)</i>
<i>Credit points</i>	<i>2</i>
<i>Required and recommended prerequisites for joining the module</i>	<i>Not required</i>
<i>Module objectives/intended learning outcomes</i>	<p><i>The purpose of the module: formation of social and humanitarian worldview of students in the context of solving problems of modernization of public consciousness.</i></p> <p><i>mastering the conceptual apparatus of cultural studies, basic theories and approaches to the study of culture;</i></p> <p><i>development of skills for describing and analyzing topical issues in the field of culture;</i></p> <p><i>formation of critical thinking skills and the ability to apply them in practice;</i></p> <p><i>formation of skills in analyzing characteristics of cultural institutions in the context of their role in the modernization of Kazakhstani society;</i></p> <p><i>the ability to analyze situations in different spheres of communication from the standpoint of correlation with the system of values, cultural, ethical norms of the Kazakhstani society;</i></p> <p><i>knowledge of the cultural policy of the state;</i></p> <p><i>the ability to work in a team, correctly defend one's point of view, propose new solutions;</i></p> <p><i>to explain and interpret subject knowledge (concepts, ideas, theories) in all fields of science that form the academic courses of the module;</i></p> <p><i>to reasonably and a well-argues manner provide information on the various stages of development of the Kazakh society, political programs, culture, language, social and interpersonal relations;</i></p> <p><i>to carry out research project activities in various areas of communication, to generate socially valuable knowledge, present it.</i></p>
<i>Content</i>	<p><i>1. Morphology of culture. The history of the formation of the concept of culture: a variety of approaches to the definition of the essence and functions of culture. Axiological, civilizational, structuralist, anthropological, conomic interpretations of the concept of culture. Review of theoretical approaches: F. Boas, L. White, Z. Freud, K. Levi-Strauss, K. Marx, E. Tylor, O. Spengler, A. Toynbee, L. Gumilyov, P. Sorokin, S. Huntington</i></p> <p><i>2. Language and semiotics of culture. Culture as a world of signs and meanings. Information-semiotic understanding of culture. Culture as a world of artifacts. Culture as a world of meanings. Types of meanings. Culture as a world of signs. Typology of symbolic systems of culture. The main types of signs and sign systems. Natural signs. Functional signs. Iconic signs. Cultural code. Cultural code concept. The uniqueness of the cultural code of the national culture. Ethos of culture. Ethos and culture code. Types of global cultural codes: preliterate (traditional), written (book), screen, digital. Mass culture code. The code of Kazakh traditional culture. Kazakh culture code.</i></p> <p><i>3. Anatomy of culture. Three-dimensional model of culture. Cultural forms. The structure of the cultural space: paradigms,</i></p>

	<p>faces of culture, cultural scenarios. Axial cultural forms: cognitive paradigms, value paradigms, regulatory paradigms. Forms of culture: myth, art, religion, morality, philosophy, law, politics, science, technology.</p> <p>4. Culture of the nomads of Kazakhstan. Archaic culture on the territory of ancient Kazakhstan: monuments of material culture. The main achievements of material ("technological") culture. The main monuments of technical achievements of the ancient world. Nomadism as a type of culture. The concept of nomadism. Typology of nomadic culture. Classification and types of nomadism (nomad culture). The main features of the culture of the nomads of the Eurasian space. The culture of ancient tribes on the territory of Kazakhstan: customs, customs, traditions, cults, beliefs.</p> <p>5. Formation of Kazakh culture. The epic culture of Kazakhs. Myths and legends of the Kazakh people. Formation of Kazakh traditional culture. Forms of folk poetry, Musical creativity of akyns and zhyrau. Musical instruments. Agon in oral Kazakh folk art. Great Kazakh biys. Rhetors of the Kazakh steppe. Speech etiquette in the Kazakh language. Cultural values and ethics of batyrs. Development of Kazakh art: painting, sculpture, architecture, opera, ballet, music, drama of the twentieth century. Famous opera performers of the XX century. Literature of Kazakhstan of the XX century.</p> <p>6. Kazakh culture in the context of globalization. Problems of preserving cultural heritage of the Kazakh people in the context of globalization. Museums of Kazakhstan and their role in the preservation of cultural heritage. Museum of the Republic of Kazakhstan in the broadcast of the cultural heritage of the Kazakh people. The role of museums in preserving the cultural and ethnic memory of the Kazakh people. Implementation of the "Madeni Mura" program, the project of museums-reserves, cultural and natural monuments of Kazakhstan.</p> <p>National museum-reserves project: Botay, Saraishyk, Bozok, cultural object Beket-Ata, Aksu Zhabagly, Korzhalgyn as a cultural and geographical framework of national identity.</p> <p>7. Cultural policy of Kazakhstan. Basic principles of cultural reform in Kazakhstan. Socio-cultural aspects of the processes of spiritual modernization in Kazakhstan. The relationship between the models of cultural policy and the system of basic values of society. Kazakhstan model of cultural policy. National idea "Mangilik Yel". Assembly of the People of Kazakhstan and its role in the cultural creation of Kazakhstani society. Basic patterns of cultural harmony. State Program "Cultural Heritage". Dynamics of traditions and innovations, mechanisms of continuity and transmission of cultural experience. Ecology of culture: difficulties and problems. Formation and development of the ecological culture of Kazakhstanis. The role of cultural institutions, cultural organizations in the creation and development of local history work.</p>
Exams and assessment formats	<p>Attendance at classes and active participation in the educational process are mandatory. Late arrivals are not allowed. Cell phones should be turned off during classes. High-quality and timely execution of SIW tasks, participation in all types of assessment (current assessment, SIW assessment, midterm assessment, final assessment) are mandatory. For a high-quality mastering of the course, students should be guided by the fact that they independently work with texts, approximately 40-60 pages per week. Code of conduct and ethics must comply with the requirements of the university charter.</p> <p>Active work at the seminar (the ability to lead a discussion, to argue one's position with references to the studied literature, a creative approach to the selection and analysis of texts), the quality of prepared individual written assignments (glossary, etc.)</p>



	and creative work (essays) are highly appreciated. Exam requirements: to find one correct answer. The assessment criteria are outlined in the syllabus
Study and examination requirements	the final grade in the module is composed of 60% performance on exams, 10% quizzes, 10% take-home assignments, 10% in-class participation. Students must have a final grade of 60% or higher to pass
Reading list	<ol style="list-style-type: none"> <li>1. Nazarbayev N.A. «NA poroge KHKHI veka». – Astana, 2016</li> <li>2. Nazarbayev N.A. «Vzglyad v budushcheye: modernizatsiya obshchestvennogo soznaniya». – Astana, Ak Orda, 2017 / <a href="http://www.akorda.kz/ru">http://www.akorda.kz/ru</a></li> <li>3. Nazarbayev N.A. «Vzglyad v budushcheye». – Astana, 2017.</li> <li>4. Beysenova G.A. «Problemy globalizatsii i identichnosti». – A., Print, 2009.</li> <li>5. Barnard Alan. «Antropologiya tarikhy men teoriyasy»/per. na kaz.yaz. Pod rukov. Kul'sariyeva A.T., Masalimova A.R. – A., 2017.</li> <li>6. «Vseobshchaya istoriya zhivopisi». – M., EKSMO, 2010.</li> <li>7. Gabitov T.Kh. «Kazak madeniyetinin tarihy: oku kuraly». – Almaty: Kazak universiteti, 2016</li> <li>8. Gabitov T.Kh. «Kazakhi: Opyt kul'turologicheskogo analiza». – Saarbrücken: Germany Academic Publishing GmbH &amp; Co. Kg lap lambert. – Heinrich-Böcking-Str. 6-8, 66121. - KG LAP LAMBERT, GERMANIYA, 2012.</li> <li>9. Gabitov T.Kh., Abdigaliyeva G.K., Ismagambetova Z.N. «Filosofiya kul'tury»: Uchebnik dlya studentov vuzov i kolledzhey. – Almaty: Evero, 2013</li> <li>10. Gabitov T.Kh., Zatov K. «Kazak madeniyetinin rukhani kenistigi». – Almaty: Raritet, 2013.</li> <li>11. Gabitov T.Kh., Mutalipov ZH., Kulsariyeva A. «Kul'turologiya». – Almaty, Raritet, 2008.</li> <li>12. Tursun Gabitov. «Actual Problems of Kazakh Culture. Kazakh Culture Challenges». - Saarbrücken: Lambert. – Publishing, 2016.</li> <li>13. «Drevniye tsivilizatsii». – M., 2009.</li> <li>14. Zholdubayeva A.K. «Kul'turologiya: praktikum». – Almaty: Kaznu im.al'-Farabi, 2014.</li> <li>15. «Istoriya kul'turologii pod red. Ogurtsova A.P». – M., Gardariki, 2006.</li> <li>16. Kairzhanova A. Palaeoturcica. «Mir drevnikh tyurkov». – Almaty, 1999.</li> <li>17. Karabayeva A.G. «Epistemologicheskiye etyudy». – Monografiya. – A., Kazak universiteti, 2016.</li> <li>18. Kondybayev S. Vvedeniye v kazakhskuyu mifologiyu. – Almaty. 1999.</li> <li>19. Khasanov M.SH., Karakozova ZH.K. Kosmos kazakhskoy kul'tury. – Almaty: TOO «Evero», 2011. – 250 s.</li> </ol>

#### **A Module Handbook**

Module designation	Physical education/ Discipline - Physical education
Semester(s) in which the module is taught	1,2,3,4 (first two years of studies)

<i>Person responsible for the module</i>	<i>Nazarkina O. N., Solov'eva N. A., Sidorova R. V. Alikey A., Tungyshmuratova L. S., Rakhimzhanov D. A.</i>
<i>Language</i>	<i>Russian, Kazakh</i>
<i>Relation to curriculum</i>	<i>Compulsory</i>
<i>Teaching methods</i>	<i>Practice, 2h (Two practical classes per week - contact hours)</i>
<i>Workload (incl. contact hours, self-study hours)</i>	<i>1 semester Total workload: 30 hours practice, 30 hours of SIW (student's independent work) each semester 2 semester – Total workload: 30 hours practice, 30 hours of SIW (student's independent work) each semester 3 semester – Total workload: 30 hours practice, 30 hours of SIW (student's independent work) each semester 4 semester– Total workload: 30 hours practice, 30 hours of SIW (student's independent work) each semester</i>
<i>Credit points</i>	<i>8 (1 semester – 2 ECTS; 2 semester – 2 ECTS; 3 semester-2; 4 semester – 2 ECTS)</i>
<i>Required and recommended prerequisites for joining the module</i>	<i>To master the discipline of physical education, knowledge, skills and abilities acquired from the school program</i>
<i>Module designation</i>	<i>Physical education/ Discipline - Physical education</i>
<i>Semester(s) in which the module is taught</i>	<i>1,2,3,4 (first two years of studies)</i>
<i>Person responsible for the module</i>	<i>Nazarkina O. N., Solov'eva N. A., Sidorova R. V. Alikey A., Tungyshmuratova L. S., Rakhimzhanov D. A.</i>
<i>Language</i>	<i>Russian, Kazakh</i>
<i>Relation to curriculum</i>	<i>Compulsory</i>
<i>Teaching methods</i>	<i>Practice, 2h (Two practical classes per week - contact hours)</i>
<i>Workload (incl. contact hours, self-study hours)</i>	<i>1 semester Total workload: 30 hours practice, 30 hours of SIW (student's independent work) each semester 2 semester – Total workload: 30 hours practice, 30 hours of SIW (student's independent work) each semester 3 semester – Total workload: 30 hours practice, 30 hours of SIW (student's independent work) each semester 4 semester– Total workload: 30 hours practice, 30 hours of SIW (student's independent work) each semester</i>
<i>Credit points</i>	<i>8 (1 semester – 2 ECTS; 2 semester – 2 ECTS; 3 semester-2; 4 semester – 2 ECTS)</i>
<i>Required and recommended prerequisites for joining the module</i>	<i>1. To master the discipline of physical education, knowledge, skills and abilities acquired from the school program</i>
<i>Module designation</i>	<i>Physical education/ Discipline - Physical education</i>
<i>Semester(s) in which the module is taught</i>	<i>1. 1,2,3,4 (first two years of studies)</i>

**A Module** BIOL 22002 General biological disciplines module

Module designation	Introduction to Biology
Semester(s) in which the module is taught	1
Person responsible for the module	Nursafina Akmaral
Language	Kazakh, Russian
Relation to curriculum	Compulsory <i>Botany, Training-fiald practice of Botany</i>
Teaching methods	Lecture (interactive method, communicative method, llab works (works in group, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Laboratory Classes - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	School Biology Course
Module objectives/intended learning outcomes	<p>The purpose of the discipline: to form a holistic understanding of the properties of living systems, the historical development of life, the role of biota in planetary processes, modern trends, problems and prospects of biological sciences, to provide a basis for the study of professional disciplines.</p> <p>Upon completion of the study of this discipline, the student must:</p> <p><b>have an idea</b> of the classification of living organisms, their main groups (pro-and eukaryotes, viruses), about the mechanisms of implementation of genetic information in cells, to represent which organelles and compartments of the cell take part in this, to represent which areas in biology are currently the most relevant.</p> <p><b>to know</b> the course of matrix synthesis processes in the cell, the structure of the cell and the functions of its organelles, the laws of gene inheritance, the preservation of genetic homeostasis in ontogenesis, to know the main biotechnological techniques for obtaining transgenic and knockout animals, transgenic plants, etc.</p> <p><b>Be able</b> to draw diagrams of matrix synthesis processes and the main components of the cell structure, genetic laws and deviations from them, the interaction of innate and acquired immunity in the fight against foreign genetic information in the body.</p>
Content	<p>1.Classification of living organisms. Viruses-precellular life forms.</p> <p>2.Eukaryotes and prokaryotes.</p> <p>3. Structure of the eukaryotic cell. Endosymbiotic theory of the origin of eukaryotes.Structure and functions of proteins. Structure and functions of nucleic acids. Replication and repair of DNA. Broadcast.</p> <p>4. Plant life as an integral part of the Earth's biosphere.</p> <p>5. The concept of the tissues of organisms</p>
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass

Reading list	<p>1 Shildebaev, Zh. Introduction to biology: textbook / Zh. Sheldebaev, A. Ermekbayeva. - Astana: Folio, 2016. - 472 p.</p> <p>2 Bersimbay R.I. Genetics, Almaty, 2017</p> <p>3 Biology: Today and Tomorrow with Physiology, 4th ed., International ed., Brooks/Cole, Cengage Learning, 2010</p> <p>4 General biology. / Yu. O. Fedotova-St. Petersburg: ITMO University; 2017. - 63 p.</p> <ul style="list-style-type: none"> <li>• <a href="https://quizizz.com/admin/reports/6087d57dbae069001d7a206a/players">https://quizizz.com/admin/reports/6087d57dbae069001d7a206a/players</a></li> <li>• <a href="https://learningapps.org/">https://learningapps.org/</a></li> <li>• <a href="https://phet.colorado.edu/">https://phet.colorado.edu/</a></li> <li>• <a href="http://www.ksscience.co.uk/animations/anim_1.htm">http://www.ksscience.co.uk/animations/anim_1.htm</a></li> </ul>
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### **A Module Handbook**

Module designation	General education module/ Discipline- Information and Communication Technologies
Semester(s) in which the module is taught	Semester 1 of the first year of studies
Person responsible for the module	Karymsakova A.E., Abildinova G.M., Kurmanbayeva A.A.
Language	English
Relation to curriculum	ICT is Compulsory discipline. Names of other study programmes with which the module is shared: Kazakh (Russian) language, Foreign language
Teaching methods	Lecture, practice
Workload (incl. contact hours, self-study hours)	Contact hours: Lectures 30 hours, practice 15 hours, independent work of the student 105 hours
Credit points	5
Required and recommended prerequisites for joining the module	Fundamentals of Computer Science, Mathematics and Physics

Module objectives/intended learning outcomes	<p><b>Knowledge:</b></p> <ul style="list-style-type: none"> <li>– to explain the purpose, content and development trends of information and communication technologies, to justify the choice of the most appropriate technology for solving specific problems; to know the features of the use of multimedia on the Internet;</li> <li>– to explain methods of collecting, storing and processing information, ways of implementing information and communication processes; to develop multimedia content;</li> <li>– to describe the architecture of computer systems and networks, the purpose and functions of the main components;</li> <li>– to use information Internet resources, cloud and mobile services to search, store, process and disseminate information;</li> <li>– to apply software and hardware of computer systems and networks for collecting, transmitting, processing and storing data;</li> <li>– to analyze and justify the choice of methods and means of information protection;</li> <li>– using digital technologies to develop analysis and data management tools for various types of activities;</li> <li>– to carry out project activities in the specialty using modern information and communication technologies.</li> </ul> <p><b>Competencies:</b></p> <ul style="list-style-type: none"> <li>– mastering by students of the conceptual foundations of the architecture of computer systems, operating systems and networks; evaluate the effectiveness of digitalization in professional areas;</li> <li>– formation of knowledge about the concepts of developing network and web applications, information security tools;</li> </ul> <p>developing skills in the use of modern information and communication technologies in various areas of professional activity, scientific and practical work, for self-education and other purposes.</p>
Content	<p>1 The role of ICT in key sectors of the development of society. ICT standards.</p> <p>2 Introduction to computer systems. Architecture of computer systems.</p> <p>3 Software. OS.</p> <p>4 Human-computer interaction.</p> <p>5 Database systems.</p> <p>6 Data analysis. Data management.</p> <p>7 Networks and telecommunications</p> <p>8 Cybersecurity.</p> <p>9 Internet technologies.</p> <p>10 Cloud and mobile technologies.</p> <p>11 Multimedia technology.</p> <p>12 Smart technologies</p> <p>13 E-technologies. Electronic business. E-learning. Electronic government</p> <p>14 Information technology in the professional field. Industrial ICT.</p> <p>15 Prospects for the development of ICT.</p>
Exams and assessment formats	<p>Matrix testing, the number of questions per student is 40. Questions are prepared in advance and loaded into Microsoft Teams Forms. The system allows students to randomly distribute questions among students. Test questions cover all the material studied. Students are not given questions in advance, but they know the list of topics.</p>
Study and examination requirements	<p>The final grade in the module is composed of 60% performance on exams, 10% quizzes, 20% take-home assignments, 10% in-class participation, 20% oral survey for two rating. Students must have a final grade of 60% or higher to pass.</p>

Reading list	<p>1. Shynybekov D.A., Uskenbayeva R.K., Serbin V.V., Duzbayev N.T., Moldagulova A.N., Duisebekova K.S., Satybaldiyeva R.Z., Hasanova G.I., Urmashhev B.A. Information and communication technologies. Textbook: in 2 parts. Part 1, 1st ed. – Almaty: IITU, 2017. – 588 p.</p> <p>2. Urmashhev B.A. Information and communication technology: Textbook / B.A. Urmashhev. – Almaty, 2016. – 410 p.</p> <p>3. Nurpeisova T.B., Kaidash I.N. ICT, Almaty, Bastau, 2017. – 241 p.</p> <p>4. Brown G., Sargent B., and Watson D. Cambridge IGCSE ICT. – London: Hodder Education Group, 2015. – 439 p.</p> <p>5. Williams B. K. and Sawyer S. Using information technology: A practical introduction to computers &amp; communications. - New York: McGraw-Hil. – 8th ed.; 2010. – 563 p.</p> <p>6. Watson D. and Williams H. Cambridge IGCSE Computer Science: Hodder Edu.; 3 ed. 2015. –278 p.</p> <p>Electronic editions:</p> <p>1. TSOR Information and communication technology. Avtory: Aymicheva G., Baygusheva B., Karazimova K., Burambayeva N., Abil'dinova G., Yermaganbetova M., Maykibayeva M., Tolǵanbayǵly T.– Rezhim dostupa: <a href="https://moodle.enu.kz/course/view.php?id=7">https://moodle.enu.kz/course/view.php?id=7</a>;</p> <p>2. Osnovy Web-tekhnologiy [Elektronnyy resurs]: uchebnoye posobiye / P.B. Khramtsov [i dr.]. – Elektron. tekstovyye dannyye. – Moskva, Saratov: Internet-Universitet Informatsionnykh Tekhnologiy (INTUIT), Vuzovskoye obrazovaniye, 2017. – 375 c. – 978-5-4487-0068-2. – Rezhim dostupa: <a href="http://www.iprbookshop.ru/67384.html">http://www.iprbookshop.ru/67384.html</a></p> <p>3. TSOR KZ Basics of cloud technologies. Avtory: Serik M., Aymicheva G., Baygusheva K., Karazimova K., Burambayeva N., Tolǵanbayǵly T.– Rezhim dostupa: <a href="https://moodle.enu.kz/course/view.php?id=8">https://moodle.enu.kz/course/view.php?id=8</a>.</p> <p>4. Massive open online-course: Information and communication technology. Avtory: Yermaganbetova M.A., Karymsakova A.Ye.- Rezhim dostupa: <a href="https://mooc.enu.kz/course/view.php?id=391">https://mooc.enu.kz/course/view.php?id=391</a></p>
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**A Module** BIOL 22002 General biological disciplines module

Module designation	Botany
Semester(s) in which the module is taught	2
Person responsible for the module	Asya Dukenbayeva
Language	Russian, Kazakh
Relation to curriculum	Compulsory Introduction to Biology, Training-field practice of Botany
Teaching methods	Lecture (interactive method, communicative method, llab works (works in group, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Laboratory Classes - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Introduction to Biology
Module objectives/intended learning outcomes	<p>The purpose of the discipline: To give students a deep knowledge of the structure and functions of plants, reproduction and distribution methods, as well as plant systematics.</p> <p>As a result of mastering the discipline, the student should <b>be able to</b>: make a morphological description of plants according to herbariums; find and identify plants, including medicinal plants, in various phytocenoses.</p> <p>The student <b>must know</b>: morphology, anatomy of plant tissues and plant systematics; latin names of the families of the studied plants and their representatives; protection of the plant world and the basics of rational use of plants.</p> <p><b>Have skills</b>: preparation of a preparation for microscoping, performing an anatomical section of an object that is optimal for microscoping description of a biological object.</p>
Content	The importance of plants in nature and in human life. Protection of the plant world. The origin of higher plants and their anatomical and morphological differentiation in connection with life on land. A plant cell. Plant tissues. Early stages of higher plant development. Structure of the embryo, seeds and seedlings. The structure of reproductive organs and plant reproduction. Ecological groups and plant life forms. Age and seasonal changes in plants.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	<ol style="list-style-type: none"> <li>1. Mukhitdinov N. Morphology and anatomy of plants: textbook / N. Mukhitdinov, A. Begenov, S. Aidosova. - Almaty: Epigraph, 2019. - 343</li> <li>2. Torsykbaeva B. B. Educational and methodological complex on the discipline Anatomy and morphology of plants-Almaty: Almanac, 2019. – 215 p.</li> <li>3. Dukenbayeva A.D. Plant systematics / A.D. Dukenbayeva. - Almaty: Epigraph, 2019. - 193, P.</li> <li>4. Botany : S. K. Imankulova, L. B. Seilova, K. I. Shalabaev, D. M. Amanbekova, A.Sh Shokanova ; Ministry of education and science of the Republic of Kazakhstan. - Almaty: Association of higher educational institutions of Kazakhstan, 2016. - 280</li> <li>5. Karipbaeva N. S. Illustrated version of flowering plants / N. S. Karipbaeva, V. V. Polevik, B. M. Silybaeva. - Almaty: Evero, 2019. - 246</li> <li>6. Abiyev S. A. Rusty mushrooms of cereals of Kazakhstan. Almaty, 2002</li> <li>7. Ametov A. A. Botany, Almaty, 2000</li> <li>8. Ametov A. A. Myrzakulov P. M., Systematics of higher plants, Almaty, 2000</li> </ol>



**A Module** BIOL 22002 General biological disciplines module

Module designation	Training-field practice of Botany
Semester(s) in which the module is taught	2
Person responsible for the module	Nursafina Akmaral
Language	Kazakh, Russian
Relation to curriculum	Compulsory Introduction to Biology, Botany
Teaching methods	Conducting a guided tour
Workload (incl. contact hours, self-study hours)	-
Credit points	3 ECTS
Required and recommended prerequisites for joining the module	Botany
Module objectives/intended learning outcomes	<p>The purpose of field practice in botany is to consolidate and improve the theoretical knowledge gained by students during the implementation of lecture and laboratory classes on the anatomy, morphology and systematics of plants, the acquisition by future pharmacists of the skills of determining medicinal plants in nature, making observations.</p> <p>As a result of studying the discipline, the student should <b>know</b>: the natural environment, the diversity of plant species in different habitats and get acquainted with the adaptation of plants to different environmental conditions.</p> <p><b>Be able to</b>: design a herbarium and consolidate the skills of working with determinants that contribute to the protection of nature.</p> <p><b>Have skills</b>: know the food, forage, poisonous and economically harmful plants in pastures, meadows and heaths, as well as the morphological and biological characteristics of the plants and the families to which they belong.</p>
Content	Structure and composition of forest phytocenoses. Compilation of geobotanical descriptions. Herbarium collection. Definition and morphological description of plant samples. Vegetation of meadows. Types of meadows. Coastal and aquatic vegetation. Biological and anatomical and morphological features of hydrophytes and hygrophytes. Medicinal species. Preparation of geobotanical descriptions. Collecting gerbarium. Agrophytocenoses. Cultivated, weed-ruderal and roadside plants.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	<p>1 Muranets A.P., Netesova M.A. Workshop on botany. - Astana, 2006 .-- 209 p.</p> <p>2 Karipbaeva N.Sh, Polevik VA Educational workshop on botany. - Semey, 2013. - 46 p.</p> <p>3 AK Skvortsov "Herbarium" (Methodical and technical manual). - Almaty, 2002. - p. 45.</p> <p>4 Explanatory dictionary of terms of biomorphology / - Almaty: "Sozdik-Slovar", 2009. ISBN 9965-822-54-9</p> <p>5 E. Ageleuov, K. Donenbaeva and others. Botany, plant anatomy and morphology. - Almaty, 1998. -366 p.</p>



### **A Module**

Module designation	Natural Sciences
Module level, if applicable	
Code, if applicable	SCIN 22003
Subtitle, if applicable	
Courses, if applicable	Chemistry
Semester(s) in which the module is taught	2 semester
Person responsible for the module	associate professor of Kusepova L.A.
Lecturer	associate professor of Kusepova L.A.
Language	russian
Relation to curriculum	Chemistry, 6B0501-Biology, university component, 2nd semester.
Type of teaching, contact hours	5 credits (150 hours), including 3 contact credits (45 hours) – 2 - lectures, 1 - laboratory classes
Workload	Lectures – 30 hours Laboratory classes – 15 hours, SRO-105 hours.
Credit points	5 ECTS
Requirements according to the examination regulations	An oral exam in which the student must demonstrate knowledge in the field of inorganic and organic chemistry, demonstrate practical skills in setting up a chemical experiment.
Recommended prerequisites	To master this discipline, you need the knowledge, skills and abilities acquired during the study of the following subjects in high school: inorganic chemistry, organic chemistry, mathematics, physics.
Module objectives/intended learning outcomes	<p>Objective: To form the basic concepts and understand the general laws connecting the structure of inorganic and organic compounds with their reactivity and the ability to predict changes in the mechanism and conditions of the chemical reaction and the properties of the resulting substances.</p> <p>Knowledge: understanding the basic concepts of inorganic chemistry: the structure of the atom, chemical bonding, thermodynamics and kinetics of chemical reactions, solution theory and coordination theory, as well as the basics of organic chemistry: Butlerov's theory of structure, the structure and properties of each class of organic compounds.</p> <p>Skills: the ability to evaluate the advantages and disadvantages of various options for the most important methods of analysis of (non)organic compounds; to calculate the concentration of solutions, solubility products, to understand the methods of qualitative analysis, to use reference literature competently,</p> <p>Competencies: the ability to use knowledge about (non -) organic substances, the structure of matter, the nature of chemical bonds, the properties of chemical elements, simple and complex compounds and materials based on them to solve problems of professional activity</p>
Content	The program of the module includes ideas about the basic laws of the course of inorganic and organic reactions, their mechanisms: establishing the dependence of the properties of elements, simple and complex substances on the electronic structures of atoms, the types of chemical bonds in compounds, specifying the laws of changes in physical and chemical properties.
Study and examination requirements and forms of examination	<p>It requires mandatory attendance of classroom classes and SROP, active participation in the discussion of issues in the classroom, preliminary preparation for classes, the implementation of tasks for independent work of students. Participation in all types of control is required.</p> <p>An oral exam in which the student must demonstrate knowledge in the field of inorganic and organic chemistry, demonstrate practical skills in setting up a chemical experiment.</p>

Media employed	Presentation for each lesson using a computer, projector, videos and slidefilms from the Internet
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### **A Module Handbook**

Module designation	General education module
Semester(s) in which the module is taught	3
Person responsible for the module	Kazakh – Zholbarysova U.K., Kenzheyev A.A., Kemberbay R.A. Russian – Tolgambayeva D.T., Mustafina T.V., Sarkulova M.S. English – Ryskulbekova D.A., Shamakhai S.
Language	Kazakh, Russian, English
Relation to curriculum	General education course
Teaching methods	lecture, seminar etc.
Workload (incl. contact hours, self-study hours)	Lectures – 30 hours, seminars – 15 hours, SIW – 105 hours (students' independent work)
Credit points	5
Required and recommended prerequisites for joining the module	Modern History of Kazakhstan, Introduction to the Specialty
Module objectives/intended learning outcomes	<p>The purpose of the module is to form in students a holistic systemic understanding of philosophy as a special form of understanding the world, its main sections, problems and methods of studying them in the context of future professional activities.</p> <ul style="list-style-type: none"> <li>– to know the categorical apparatus of philosophy;</li> <li>– to explain the specifics of the philosophical understanding of reality;</li> <li>– to substantiate the worldview as a product of philosophical understanding and the study of the natural and social world;</li> <li>– to classify the methods of scientific and philosophical knowledge the world;</li> <li>– to interpret the content and specifics of the mythological, religious and scientific worldview;</li> <li>– to substantiate the role and significance of such key worldview concepts as values of social and personal life of a person in the modern world;</li> <li>– to analyze the philosophical aspect of media texts, social cultural and personal situations to justify and accept ethical decisions;</li> <li>– to formulate and correctly argue one's own moral position in relation to urgent problems of the modern global society;</li> <li>– to conduct research relevant to identifying philosophical content of problems in the professional field and present the results for discussion.</li> </ul>
Content	<ol style="list-style-type: none"> <li>1. The emergence of a culture of thinking.</li> <li>2. The subject and method of philosophy.</li> <li>3. Consciousness, soul and language.</li> <li>4. Being. Ontology and metaphysics.</li> <li>5. Cognition and creativity.</li> <li>6. Education, Science, Engineering and Technology.</li> <li>7. Human being.</li> <li>8. Life and death. Meaning of life.</li> <li>9. Ethics. Philosophy of values.</li> <li>10. Philosophy of Freedom.</li> <li>11. Philosophy of art.</li> <li>12. Society and culture.</li> <li>13. Philosophy of history.</li> <li>14. Philosophy of religion.</li> <li>15. "Mangilik Yel" and "Rukhani Zhagyr" – the philosophy of the new Kazakhstan</li> </ol>

Exams and assessment formats	<p>Attendance at classes and active participation in the educational process are mandatory. Late arrivals are not allowed. Cell phones should be turned off during classes. High-quality and timely execution of SIW tasks, participation in all types of assessment (current assessment, SIW assessment, midterm assessment, final assessment) are mandatory. For a high-quality mastering of the course, students should be guided by the fact that they independently work with texts, approximately 40-60 pages per week. Code of conduct and ethics must comply with the requirements of the university charter.</p> <p>Active work at the seminar (the ability to lead a discussion, to argue one's position with references to the studied literature, a creative approach to the selection and analysis of texts), the quality of prepared individual written assignments (glossary, etc.) and creative work (essays) are highly appreciated.</p> <p>Exam requirements: to find one correct answer. The assessment criteria are outlined in the syllabus</p>
Study and examination requirements	<p>Requirements for successfully passing the module e.g. the final grade in the module is composed of 60% performance on exams, 10% quizzes, 10% take-home assignments, 10% in-class participation. Students must have a final grade of 60% or higher to pass</p>
Reading list	<ol style="list-style-type: none"> <li>1. Nazarbayev N.A. Vzgl'yad v budushcheye: modernizatsiya obshchestvennogo soznaniya. <a href="http://www.akorda.kz">http://www.akorda.kz</a>.</li> <li>– Nazarbayev N.A. Маңғилік. Yel. Gody, ravnyye vekam. Epokha, ravnaya stoletiyam. – Astana: Delovoy mir Astana, 2014. – 368 c.</li> <li>2. Nurysheva G.Zh. Filosofiya. – Almaty: Inzhu-marzhan, 2013.</li> <li>3. Petrova V.F., Khasanov M.SH. Filosofiya. – Almaty: Evero, 2014.</li> <li>4. Garifolla Yesym. Falsafa tarikhy, – Almaty, 2000.</li> <li>5. Garifolla Yesym. Kazak filosofiyasynyn tarikhy, – Almaty, 2006</li> <li>6. Garifolla Yesym. Adam-zat, – Astana, 2008.</li> <li>7. Bertran R. Istoriya zapadnoy filosofii. – M.: Izdatel' Litres, 2018. – 1195 s.</li> <li>8. Johnston D. Filosofiyany kyskasha tarikhy. Sokrattan Derridaga deyin / Gylymi red. Nurysheva G.Zh. – Astana, 2018. – 216 b.</li> <li>9. Hess R. Filosofiyany tандаулы 25 kytaby. / Gylymi red. Rayev D.S. – Astana, 2018. – 360b6.</li> <li>10. Kenny E. Batys filosofiyasynyn zhana tarikhy. 1-tom: Antika filosofiyasy / Nauch. redaktor Moldabekov Zh.Zh. – Astana, 2018. – 408 b.</li> <li>11. Kenny E. Batys filosofiyasynyn zhana tarikhy. 2- tom: Orta gasyr filosofiyasy / Nauch. redaktor Ospanov S. – Astana, 2018. – 400 b.</li> <li>12. Karen Armstrong. Iudaizm, khristiandyk pen islamdagy 4000 zhyldyk yzdenys: Kudaytanu bayany/ Nauch. redaktor Kenzhetay D. - Astana, 2018. – 496 b.</li> <li>13. Johnston D. A Brief History of Philosophy: From Socrates to Derrida. –A&amp;C Black, 2006. – 211 p.</li> <li>14. Kenny A. New History of Western Philosophy. Volume 1-4. – Oxford University Press, 2006 - 2010.</li> <li>15. Humphreys P. The Oxford Handbook of Philosophy of Science. – Oxford University Press, 2016.</li> <li>16. Estlund D. The Oxford Handbook of Political Philosophy. – Oxford University Press, 2017.</li> <li>17. Cappelen H., Gendler T., Hawthorne J. The Oxford Handbook of Philosophical Methodology. – Oxford University Press, 2016.</li> <li>18. Karen Armstrong A History of God: The 4000-year quest of judaism, christianity and islam. – Gramercy Books, 2014. – 496 p.</li> <li>19. Johnsom D. Kratkaya istoriya filosofii/ per. Ye.Ye. Sukharev. - M.: Astrel', 2010. – 236 c.</li> <li>20. Khess R. 25 klyuchevykh knig po filosofii. – M.: Ural LTD, 2000. – 368 s.</li> </ol>

## **A Module Handbook**

Module designation	Natural Sciences
Module level, if applicable	Basic Discipline University Component (BD UC)
Code, if applicable	SCIN 22003
Subtitle, if applicable	
Courses, if applicable	Physics
Semester(s) in which the module is taught	3
Person responsible for the module	Aliya Mukasheva
Lecturer	Aliya Mukasheva
Language	Kazakh, Russian
Relation to curriculum	6B05107 – Biology, Bachelor's degree, Qualification level: 6 NQF, 6 EQF
Type of teaching, contact hours	45 (Lectures- 30, Practical Classes -15)
Workload	Lectures- 15, Practical Classes -30, Students Individual Work -105
Credit points	5 ECTS
Requirements according to the examination regulations	At the end of the semester, the exam is given orally. Exam tickets are used for the examination. The list of questions included in the exam tickets is known to students in advance for preparation. Retaking the exam to improve the score is not allowed. Each exam ticket contains three questions. Students are given 30 minutes to prepare for the answers to the exam questions.
Recommended prerequisites	School Physics course
Module objectives/intended learning outcomes	<p>The purpose of studying this discipline is to form the bachelor's understanding of the modern physical picture of the world and the scientific worldview, knowledge and skills of using fundamental laws, theories of classical and modern physics, as well as methods of physical research as the basis of the system of professional activity.</p> <p>To know: - general laws of physics for solving specific problems;  - formulations and proofs of the main theorems, be able to apply them when performing laboratory work; use physical devices, process, analyze and evaluate the results obtained;  be able to: - use reference and educational literature when working, find the necessary sources of information and work with them;  - understand the essence of the main methods used in physical research;  - independently study individual topics and write essays on these topics and speak on them;  have skills: - and methods of using this knowledge for theoretical and practical purposes;  - use of knowledge of physics in the study of other academic disciplines;</p>
Content	Physical fundamentals of mechanics. Kinematics. Dynamics of a material point and the translational motion of a solid body. Dynamics of the rotational motion of a rigid body. Conservation laws. Energy as a universal measure of various forms of motion and interaction. Fundamentals of thermodynamics. Reversible and irreversible thermal processes. Transfer phenomena. Real gases. Electrostatics and direct current. Direct electric current.
Study and examination requirements and forms of examination	<p>The student must complete the assigned tasks within a strictly defined time frame.</p> <p>Being late for classes is not welcome. A student who misses classes or fails to complete a task is not allowed to take the exam.</p> <p>Attendance is mandatory; absence can only be for a valid reason. All missed classes are worked out in the form of individual tasks, problem solving, preparation of presentations, etc.</p> <p>Exam form: Combined exam.</p>

<i>Media employed</i>	<i>Presentation for each lesson using a computer, projector, interactive whiteboard</i>
<i>Reading list</i>	<ol style="list-style-type: none"> <li>1. Savelyev I. V. <i>Course of general physics in 5 books.</i> - M.: Astrel: AST, 2008.</li> <li>2. Trofimova T. I. <i>Course of Physics</i> – - M.: ACADEMIA, 2008.</li> <li>3. Detlaf A. A., Yavorsky B. M. <i>Course of physics.</i> - M.: ACADEMIA, 2008</li> <li>4. Irodov I. E. <i>Problems in general physics.</i> - M.: Fizmatlit., 2009</li> <li>5. Trofimova T. I. <i>Collection of problems in the course of physics for universities.</i> - M.: Onyx 21 century, 2008</li> <li>6. Volkenshtein V. S. <i>Collection of problems on the general course of physics.</i> - St. Petersburg: Knizhny Mir, 2008.</li> <li>7. <i>Collection of tests for students of higher educational institutions in the following disciplines interim state control. National Center for State Standards of Education and Testing.</i> - Astana, 2008</li> </ol>

**A Module** BIOL 22002 General biological disciplines module

<i>Module designation</i>	<i>Invertebrate Zoology</i>
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Semester(s) in which the module is taught	3
Person responsible for the module	Daniyar Tagayev
Language	Kazakh, Russian
Relation to curriculum	Compulsory Vertebrate zoology, Training-field practice in zoology
Teaching methods	Lecture (interactive method, communicative method, llab works (works in group, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures- 15, Seminars - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	School Zoology course
Module objectives/intended learning outcomes	The purpose of studying this discipline is to form basic knowledge about the structure and diversity of representatives of various types of invertebrates, their phylogenetic relationships and systematic position. As a result of studying the discipline, the student should <b>know</b> : the features of the external and internal structure, diversity, the reasons for progress and the role of different groups of chordates. <b>Be able to</b> : apply the acquired knowledge in solving scientific and practical problems in future professional activities. <b>Possess the skills of</b> : diagnostics and classification of various groups of vertebrates, master the methods of research of animal organisms.
Content	Introduction to zoology, introduction to animal-like protists and sponges. Primordial invertebrates. Secondary-cavity invertebrates.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	1. Dzerzhynskiy F., Vasilyev B., Malakhov V. Vertebrate Zoology. Textbook. — M.: "The Academy", 2013 2. Konstantinov V.M., Naumov S.P., Shatalova S.P. Vertebrate Zoology. M.: "The Academy", 2000 3. Kardong K.V. Vertebrates. Comparative anatomy, function, evolution; 6th ed. — New York: McGraw-Hill, 2012. — 794 p.

**A Module** BIOL 22002 General biological disciplines module

Module designation	Human Anatomy
Semester(s) in which the module is taught	3
Person responsible for the module	Oralbek Ilderbayev
Language	Russian, Kazakh
Relation to curriculum	Compulsory Human Morphology
Teaching methods	Lectures, Laboratory Classes
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Seminars - 30 Students Individual Work :105
Credit points	8 ECTS
Required and recommended prerequisites for joining the module	Cytology and histology



Module objectives/intended learning outcomes	<p>The purpose of teaching human anatomy is to give knowledge about the structure of the body, about the changes that occur in the process of its development, taking into account biological patterns.</p> <p>At the end of the Normal Anatomy course, students must</p> <p><b>To know:</b> the main directions and stages of the development of anatomical science, its significance for medicine and biology, methods of anatomical research; basic patterns of development and vital activity of the human body on the basis of the structural organization of organs and systems; structure, functions, topography and development of all organs and systems of the body, taking into account age, gender and individual characteristics; possible variants of the structure, the main anomalies and malformations of organs and their systems; anatomical and topographical relationship of individual organs and parts of the human body; blood supply, lymph flow pathways, and organ innervation; anatomical terms in accordance with the International Anatomical Nomenclature.</p> <p><b>Be able to</b> (on anatomical preparations, models, images obtained by various visualization methods, in the sitter): accurately and precisely identify the parts and areas of the human body; identify the main bone formations, joint crevices, muscle contours and their projection on the surface of the body; accurately and precisely determine the location and projection of the organs on the surface of the body and in relation to the skeleton; accurately and precisely determine the location of the main blood vessels and nerves, the places of pulsation of the arteries.</p> <p><b>your own:</b> medical-anatomical conceptual apparatus and mastery of its use; ability to work with biological material and use the simplest medical tools – scalpel and tweezers; basic technologies of information transformation: independent work with educational literature on paper and electronic media, Internet resources on human anatomy.</p>
Content	Anatomy as a science. A brief outline of the development of anatomy. The skeletal system. Connecting the bones. The muscular system. The digestive system. Respiratory system. Urogenital system. Vascular system. Organs of hematopoiesis and the immune system. Central nervous system. Peripheral nervous system. Analyzers. The doctrine of internal secretions
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	<p>1 Sapin M.R. Human anatomy. In 2 vols.: textbook for students of institutions of higher pedagogical education. Vol. 2. Moscow: Akademiya, 2015. 344 p</p> <p>2 Lysov P.K. Human anatomy (with the basics of sports morphology). In 2 points : a textbook for students of higher educational institutions studying in the direction of "Physical culture and sport". Vol. 2. Moscow: Akademiya, 2015. 287 p. (in Russian).</p> <p>3 Tsekhmistrenko T.A. Human Anatomy: a textbook for students of higher education institutions. Moscow: Akademiya, 2016. 250 p.</p> <p>4 Shvyrev A. A. Human anatomy and physiology with the basics of general pathology: a textbook for students of educational institutions of secondary vocational education, studying in medical schools and colleges. Rostov-on-Don: Phoenix, 2018. 411 p.</p> <p>5 Omash, K. Anatomy: textbook / Karaganda: AKNUR, 2013. 375.</p> <p>6 Aubakirov, A.B. Human anatomy. Atlas. Volume 4. Astana: Saryarka, 2014. 399</p> <p>7 Atlas of anatomy and physiology [electronic resource] / AVT.: R. I. Yessimbekova, T. A. Izmukhambetov, S. Sh. Sakhisheva, M. K. Musazhanova; Almaty: Arys, 2007. 170.</p>

#### **A Module** BIOL 22002 General biological disciplines module

Module designation	Human morphology
Semester(s) in which the module is taught	3

Person responsible for the module	Oralbek Ilderbayev
Language	Russian, Kazakh
Relation to curriculum	Compulsory Human Anatomy
Teaching methods	Lectures- 30, Laboratory Classes
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Seminars - 30 Students Individual Work :105
Credit points	8 ECTS
Required and recommended prerequisites for joining the module	Cytology and histology
Module objectives/intended learning outcomes	The purpose of the discipline is to study the variations in the structure of the human body, its organs and parts (individual, age, gender, ethno-territorial, etc.). The student should <b>know</b> : changes in morphofunctional characteristics in the process of individual human development. <b>Must be able to</b> : study the variants of combinations of morphological, physiological and psychological parameters of organisms (constitution) found in modern humans. <b>Must have the skills</b> : to study the course of various morphological, functional and psychological changes in ontogenesis, and to take into account the biological and social factors of human development.
Content	Human morphology and its place among the biological Sciences. Periodization of human ontogenesis. The main stages of human development in the prenatal period. The main stages of human development in the postnatal period. The constitution of the human body. Physical development and acceleration of a person. Human body composition and constitution.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	1 Nikityuk B. A. Morphology of man / B. A. Nikityuk, V. P. Chytetsov. - M.: Izd-voMSU, 1990-343c. 2 Sapin M. R., Bilich G. A. Human anatomy. - M.: GABORN-MED-2001, - 463s. 3 Green N. Biology: In 3 t. / N / dGrin, I. Stadion, D. Taylor. - Per. s engl. - M.: Mir, 1990 T1. - 368s. 4 Sapin M. R. Anatomy and human physiology (with age-related features of the child's body) / M. R. Sapin, V. I. Sivoglazov. - M.: Akademiya, 2002-448s 5 Ermolenko E. K. Age morphology /E. K. Ermolenko-Rostov n / A: Fenix, 2006-464c. 6 Tegako L. Antropologiya /L. Tegako, E. Klitinsky-M.: Novoe znanie, 2004 - 400s.

**A Module** BIOL 33004 Cell Biology, General and Molecular Genetic

Module designation	Cytology and Histology
Semester(s) in which the module is taught	3
Person responsible for the module	Zhannat Bazarbayeva
Language	Russian, Kazakh
Relation to curriculum	Compulsory Cytology and Histology with the basics of Embryology
Teaching methods	Lecture (interactive method, communicative method, llab works (works in group, communicative method)



Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, laboratory classes - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Zoology Course
Module objectives/intended learning outcomes	<p>As a result of studying the discipline the student should <b>know</b>: history of Cytology and histology; light, electron microscopy, digital cytochemical, autoradiographic methods; structure and function of cells and tissues; the basic principles of the cell theory; structure and function of the cell nucleus, cell organelles as an important part of cells; mechanisms of cell division; classification of tissues; structure and function of epithelial, connective, muscle and nervous tissues;</p> <p><b>Be able to</b>: work with the main types of light microscopes; microscopy of cytological and histological preparations, cell culture; differentiation of different types of cells and tissues; find and describe the main elements of cells and tissues under a microscope; describe and analyze the structural elements of cells and tissues on microphotographs and electrograms; systematize and summarize the data obtained by statistical methods; search for scientific information in the field of cytology and histology by analyzing domestic and foreign literature.</p> <p><b>Have the skills to</b>: conduct experimental studies at the tissue, cellular and subcellular levels; apply and analyze the knowledge gained in the study of cells and tissues under normal and pathological conditions.</p>
Content	The emergence and development of cytology and histology. Cell structure. Structural and functional organization of biological membranes. The vesicular system of the cell. Mitochondria and plastids. The cytoskeleton of the cell. Ribosome structure and protein biosynthesis. The cell nucleus. Cell cycle, mitosis, meiosis. General histology.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	<ol style="list-style-type: none"> <li>1. Myrzagaliyeva, AB Cytology: textbook / A.B. Myrzagaliyeva; Ministry of Education and Science of the Republic of Kazakhstan. - Almaty: Daur, 2013. – 214</li> <li>2. Bazarbaeva Zh.M. Cytology and histology. textbook Almaty, 2011, 208.</li> <li>3. K.A. Saparov, Zh.M. Bazarbayeva, B.A. Abdullaeva. Glossary of terms cytology, histology, embryology. Almaty, 2012, 454p.</li> <li>4. Nurtazin ST General histology. textbook Almaty, 2010</li> <li>5. Chentsov Y.S Introduction to cellular biology. Textbook. Moscow, 2015, 495p.</li> <li>6. Myadelets OD Human histology, cytology and embryology. Part 1. Cytology, embryology and general histology: textbook. - Vitebsk: VSMU, 2014 - 439 p.</li> </ol>

**A Module** BIOL 33004 Cell Biology, General and Molecular Genetics

Module designation	Cytology and Histology with the basics of Embryology
Semester(s) in which the module is taught	3
Person responsible for the module	Zhannat Bazarbayeva
Language	Russian, Kazakh
Relation to curriculum	Compulsory Cytology and Histology
Teaching methods	Lecture (interactive method, communicative method, lab works (works in group, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Seminars - 30 Students Individual Work :105

Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Zoology Course
Module objectives/intended learning outcomes	<p>As a result of studying the discipline the student should <b>know</b>: history of Cytology, histology and embryology; light, electron microscopy, digital cytochemical, autoradiographic methods; structure and function of cells and tissues; the basic principles of the cell theory; the mechanisms of cell division; classification of tissues; structure and functions of epithelial, connective, muscle and nervous tissues; the main stages of embryonic development.</p> <p><b>Be able to</b> work with the main types of light microscopes; microscopy of cytological and histological and embryological preparations; find and describe the main elements of cells and tissues under a microscope; describe and analyze the structural elements of cells and tissues on microphotographs and electrograms.</p> <p><b>Possess the skills of</b>: conducting experimental studies at the tissue, cellular and subcellular levels; applying and analyzing the knowledge gained in the study of cells, tissues and embryological preparations under normal and pathological conditions.</p>
Content	The doctrine of the cell. Structure and function of the cell nucleus. Organization of the cytoplasm, biomembrane, structure of the cell wall. Chemical composition of hyaloplasm. Structure and functions of cellular organoids. Cell reproduction. Reproduction of organisms. Types of reproduction. Embryonic development or embryogenesis. Crushing. Gastrulation. Neurulation. Development of organisms. Periods of development of organisms. Experimental embryology or developmental mechanics. Predictive maps of the development of the body. General histology.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	<ol style="list-style-type: none"> <li>1. Myrzagaliyeva, AB Cytology: textbook / A.B. Myrzagaliyeva; Ministry of Education and Science of the Republic of Kazakhstan. - Almaty: Daur, 2013. – 214</li> <li>2. Bazarbaeva Zh.M. Cytology and histology. textbook Almaty, 2011, 208.</li> <li>3. K.A. Saparov, Zh.M. Bazarbayeva, B.A. Abdullaeva. Glossary of terms cytology, histology, embryology. Almaty, 2012, 454p. (in Kazakh)</li> <li>4. Nurtazin ST General histology. textbook Almaty, 2010 (in Kazakh)</li> <li>5. Chentsov Y.S. Introduction to cellular biology. Textbook. Moscow, 2015, 495p.</li> <li>6. Nurtazin S.T., Vsevolodov E.B. Biology of Individual Development: A Textbook. - Almaty: Kazakh University, 2005. -260 p.</li> <li>7. Myadelets OD Human histology, cytology and embryology. Part 1. Cytology, embryology and general histology: textbook. - Vitebsk: VSMU, 2014 - 439 p.</li> </ol>

#### **A Module Handbook**

Module designation	Natural Sciences
Module level, if applicable	Basic Discipline University Component (BD UC)
Code, if applicable	SCIN 22003
Subtitle, if applicable	-
Courses, if applicable	Mathematics
Semester(s) in which the module is taught	4
Person responsible for the module	Gulmira Kenzhebekova, Zauresh Suleimenova
Lecturer	Gulmira Kenzhebekova, Zauresh Suleimenova
Language	Kazakh, Russian

<i>Relation to curriculum</i>	6B05107 – <i>Biology, Bachelor's degree, Qualification level: 6 NQF, 6 EQF</i>
<i>Type of teaching, contact hours</i>	45 (Lectures- 15, Laboratory Classes-30)
<i>Workload</i>	Lectures- 15, Laboratory Classes-30, Students Individual Work-105
<i>Credit points</i>	5 ECTS
<i>Requirements according to the examination regulations</i>	Matrix testing
<i>Recommended prerequisites</i>	Elementary mathematics
<i>Module objectives/intended learning outcomes</i>	<p>As a result of studying the discipline, the student must know:  Bases of linear algebra elements of analytic geometry, the elements of the mathematical analysis.  How to choose the optimal numerical methods for solving mathematical and biological problems.  How to provide the processing of the results.</p> <p>As a result of studying the discipline, the student should be able to:  construct mathematical models of simple systems and processes in the natural sciences.</p> <p>As a result of studying the discipline, the student must have the skills:  applying mathematical methods for solving typical professional tasks.</p>
<i>Content</i>	The content of the discipline covers the whole range of problems linear algebra, vector algebra, analytical geometry, mathematical analysis. Systems of linear equations. Matrix method. Gauss method. Basis. Decomposition of vectors into components. The scalar product of vectors. Vector product of vectors. Mixed product of vectors. Rectangular coordinate system. Polar coordinate system. Various equations line on the plane. Limit. Continuity of function. Derivative of the function. Differential function. Function study using derivative. Indefinite integral. Definite integral. Some applications of the definite integral. Complex numbers. Functions of several variables.
<i>Study and examination requirements and forms of examination</i>	Matrix testing
<i>Media employed</i>	Presentation for each lesson using a computer, projector, interactive whiteboard
<i>Reading list</i>	<p>D.Pismenny. Abstract of lectures on higher mathematics. -M.: Airis-press, 2011.</p> <p>K.Lungu. Collection of problems in higher mathematics. 1 course. - M.: Airis-press, 2011.</p> <p>Higher mathematics for economists: Textbook for universities / Kremer, B.A. Putko, I.M. Trishin, M.N. Friedman; Ed. Prof. N.Sh. Kremer. – M.: UNITI, 2011.</p> <p>Collection of individual tasks in higher mathematics. Edited by A.P.Ryabushko Part 1-2. Minsk: Higher School. 2010.</p>

#### **A Module** BIOL 22002 General biological disciplines module

<i>Module designation</i>	Biochemistry
<i>Semester(s) in which the module is taught</i>	4
<i>Person responsible for the module</i>	Ainash Suleimenova
<i>Language</i>	Russian, Kazakh
<i>Relation to curriculum</i>	Compulsory Human and animal physiology
<i>Teaching methods</i>	Lecture (interactive method, communicative method, llab works (works in group, communicative method)
<i>Workload (incl. contact hours, self-study hours)</i>	Total workload: 150 Contact hours: Lectures - 15, laboratory classes - 30 Students Individual Work :105
<i>Credit points</i>	5 ECTS
<i>Required and recommended prerequisites for joining the module</i>	Chemistry

Module objectives/intended learning outcomes	As a result of studying the discipline, the student should <b>know</b> : about the chemical composition of living organisms; methods of isolation and study of substances in the wild; chemical properties of the structural components of biopolymers. <b>Be able to</b> : use the modern material and technical and methodological base for the biochemical characteristics of proteins and nucleic acids; use in practice modern methods of studying proteins and nucleic acids <b>Possess the following skills</b> : interpretation of the results obtained
Content	structure and properties of proteins. Classification and nomenclature of enzymes. Metabolism of breeders: dichotomous and apotomic egradation of glucose. Mechanism of glycolysis and gluconeogenesis. Biosynthesis of glycogen. Nucleic acids: DNA, RNA. Replication, repair, transcription and translation. Energy exchange. Krebs cycle chemistry. Tissue respiration. Respiratory chain. Lipid metabolism. Vitamins. Hormones.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	1. Komov, V.P. Biochemistry: a textbook for academic undergraduate studies / V.P. Komov, V.N.Shvedova; under the general editorship of V.P. Komov. 4th ed., Rev. and add. Moscow: Yurayt Publishing House, 2016. 640 p.ISBN 978-5-9916-3929-3 <a href="https://biblio-online.ru/bcode/396209">https://biblio-online.ru/bcode/396209</a> 2. Seitov, ZS Biochemistry: textbook. 4th ball. and processing. ed. - Almaty: Akbar, 2011. - 795, p. ISBN 978-601-278-298-1. <a href="https://www.twirpx.com/file/3066655/">https://www.twirpx.com/file/3066655/</a> 3. Biochemistry, Genetics & Molecular Biology.2016. 117 pages, <a href="https://www.pdfdrive.com/biochemistry-genetics-molecular-biology-e18198970.html">https://www.pdfdrive.com/biochemistry-genetics-molecular-biology-e18198970.html</a> 4. Ukbayeva TD, Suleimenova AE Classification and biochemistry of hormones Teaching aid NMS ENU Astana, ENU them. L.N. Gumilyov 2017.-90s. <a href="https://www.enu.kz/ru/nauka/sborniki-konferentsiy/">https://www.enu.kz/ru/nauka/sborniki-konferentsiy/</a> 5. Shamraev A.V. Biochemistry: textbook. OSU. 2014. P.186. <a href="https://www.twirpx.com/file/2206794/">https://www.twirpx.com/file/2206794/</a>

#### **A Module** BIOL 22002 General biological disciplines module

Module designation	Human and animal physiology
Semester(s) in which the module is taught	4
Person responsible for the module	Zhanat Mukataeva
Language	Russian, Kazakh
Relation to curriculum	Compulsory Biochemistry
Teaching methods	Lecture (interactive method, communicative method, lab works (works in group, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, laboratory classes - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Human Anatomy, Cytology and Histology

Module objectives/intended learning outcomes	<p>As a result of studying the discipline, the student must <b>know</b>: about the physiological functions of the body and the systems of their regulation, the regulatory mechanisms of ensuring the homeostasis of living systems, about the functions of the nervous, endocrine, cardiovascular, respiratory, excretory and other systems of the body.</p> <p>As a result of studying the discipline, the student should <b>be able to</b>: analyse scientific literature, carry out experiments in the framework of a laboratory workshop, evaluate the functional state of various body systems.</p> <p>As a result of studying the discipline, the student must have practical skills and basic methods of experimental physiological research.</p>
Content	Physiology of excitable tissues. Physiology of the central nervous system. Physiology of the endocrine system. The main functions of the blood and lymph. Physiology of the cardiovascular system. Physiology of the heart. Physiology of the respiratory system. Metabolism and energy. Physiology of digestion. Functions of the kidneys and additional excretory organs. Sensor system.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	<ol style="list-style-type: none"> <li>1. "Human and animal physiology": / U. K. Akhanov. Almaty: Epigraph, 2016. - 235,p.</li> <li>2. "Age-related anatomy and physiology": for students.vuzov / N. F. Lysova, R. I. Aizman. - M.: INFRA, 2016. - 352 p.( Russian)</li> <li>3. "Human and animal physiology": U. K. Akhanov.- Almaty: Epigraph,2016. - 178, p.( Russian)</li> <li>4. "Age-related human physiology". / Sarsekeeva G. Zh., - Almaty: Nur-Print, 2018 – - 148 p.( Russian)</li> <li>5. "Physiology of sensory systems": educational and methodological manual: S. V. Moryakina, V. A. Anzarov. - Grozny: 2015 – - 153 p.( Russian)</li> <li>6. "Age-related anatomy and physiology": for academic undergraduate studies. / Z. V. Lyubimova, A. A. Nikitina ; MSPU. - 2nd ed., reprint. and add. - M.: Yurayt, 2014. - 447 p.( Russian)</li> <li>7. "Anatomy and age physiology" : for bachelors / A. O. Drobinskaya; MGPPU. - M.: Yurayt, 2014. - 527 p.( Russian)</li> <li>8. "Fundamentals of sensory physiology": a textbook/ R. Schmidt. - M.: - HER Media, 2012. - 287 p.( Russian)</li> <li>9. "Research and assessment of the state of health of schoolchildren": / Mukataeva Zh.M., Dinmukhamedova A. S. – Nur - Sultan 2020. - 122 p. (in Kazakh).</li> <li>10. "Human physiology": / H. K. Satpayeva, A. A. Utepbergenov, Zh. B. Nildibayeva. - Revised and supplemented second edition. - Almaty: Evero publ., 2014. - 664 p. (in Kazakh).</li> <li>11. Human and animal physiology: / Z. A. Askarova, G. T. Sraiova, S. S. Markeeva - Almaty: Kazakh university, 2015. – 204p. (in Kazakh)</li> </ol>

#### **A Module** BIOL 22002 General biological disciplines module

Module designation	Vertebrate Zoology
Semester(s) in which the module is taught	4
Person responsible for the module	Daniyar Tagayev
Language	Kazakh, Russian
Relation to curriculum	Compulsory Invertebrate Zoology, Training-fiald practice of Zoology
Teaching methods	Lecture (interactive method, communicative method, llab works (works in group, communicative method)
Workload (incl. contact hours, self-study hours)	<p>Total workload: 150</p> <p>Contact hours: Lectures - 15, Seminars - 30</p> <p>Students Individual Work :105</p>



Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Cytology and Histology, Invertebrate Zoology
Module objectives/intended learning outcomes	<p>As a result of studying the discipline, the student must <b>know</b>: the features of the external and internal structure, the variety, the reasons for the progress and the role of various groups of chordates.</p> <p>As a result of studying the discipline, the student should <b>be able to</b>: apply the acquired knowledge in solving scientific and practical problems in the future professional activity.</p> <p>As a result of studying the discipline, the student must have <b>the skills</b>: of diagnosing and classification of different groups of vertebrates, to own methods of research of animal organisms.</p>
Content	General characteristics of the Chordate Type. Phylogeny of chordates. Fossil chordates. Vertebrates (Vertebrata). Jawless (Agnatha). Round-mouthed. Cartilaginous fish (Chondrichthyes). Bony fish (Osteichthyes). Amphibians, or Amphibians (Amphibia). Reptiles, or Reptiles (Reptilia). Birds (Aves). Mammals (Mammalia).
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	<ol style="list-style-type: none"> <li>1. Dzerzhynskiy F., Vasilyev B., Malakhov V. Vertebrate Zoology. Textbook. — M.: "The Academy", 2013 (in Russian)</li> <li>2. Konstantinov V.M., Naumov S.P., Shatalova S.P. Vertebrate Zoology. M.: "The Academy", 2000 (in Russian)</li> <li>3. Kardong K.V. Vertebrates. Comparative anatomy, function, evolution; 6th ed. — New York: McGraw-Hill, 2012. — 794 p.</li> </ol>

#### **A Module** BIOL 22002 General biological disciplines module

Module designation	Training-field practice in zoology
Semester(s) in which the module is taught	4
Person responsible for the module	Daniyar Tagayev
Language	Kazakh, Russian
Relation to curriculum	Compulsory Invertebrate Zoology, Vertebrate zoology
Type of teaching, contact hours	Conducting a guided tour
Workload (incl. contact hours, self-study hours)	-
Credit points	3 ECTS
Required and recommended prerequisites for joining the module	Invertebrate Zoology, Vertebrate zoology
Module objectives/intended learning outcomes	<p>As a result of studying the discipline, the student must <b>know</b>: - the main features of the structure and development of animals; ecology and distribution of animals; representatives of the fauna of Kazakhstan.</p> <p>As a result of studying the discipline, the student should <b>be able to</b>: to navigate in the species composition of animals in a given environmental zone; carry out environmental education and popularization of students and the population.</p> <p>As a result of studying the discipline, the student must have <b>the skills</b>: of using field and laboratory methods of zoological research and study of material on zoology and animal ecology.</p>
Content	Observe animals in their natural habitat, and evaluate all the complex relationships of animals with each other and their habitat. Guided tours with a teacher, laboratory processing of collected material, field documentation, students' own observations of animals.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass

Reading list	<p>1. Dauda T.A., Koschaev A.G. <i>Workshop on zoology</i>. – 2014 (in Russian)</p> <p>2. Yazykova I. M. <i>Workshop on Invertebrate Zoology</i>. - 2010. (in Russian)</p> <p>3. Koneva L. A., Mashinskaya N. D. <i>Workshop on the zoology of vertebrates</i>. – 2011 (in Russian)</p>
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### **A Module Handbook**

Module designation	Module of general education Discipline - Entrepreneurship and Business
Semester(s) in which the module is taught	4 semester
Person responsible for the module	Ryspekova M.O., Kozhahmetova G.A/ – Russian Karipova A.T. – Kazakh
Language	Russian, Kazakh
Relation to curriculum	elective component
Teaching methods	lessons, laboratory works, projects, seminars
Workload (incl. contact hours, self-study hours)	Contact 45 hours: lessons 30 hours, practical seminars 15 hours. Total 150 hours: lectures 30, seminars 15, students' independent work 105.
Credit points	5
Required and recommended prerequisites for joining the module	Knowledge of the economy fundamentals in the scope of secondary school program
Module objectives/intended learning outcomes	<p>“Entrepreneurship and Business” is the acquisition of the necessary skills of entrepreneurial activity, understanding the mechanism of functioning of the market structure in business.</p> <p>Knowledge: acquaintance with the theory of business and entrepreneurship, systematization of regulatory, economic, organizational and managerial knowledge on the formation, conduct of entrepreneurship and business.</p> <p>Skills: cognitive and practical skills for the development of entrepreneurial thinking for solving specific problems and business situations. Skills in the preparation, assessment and implementation of business development projects in various sectors of the economy. Skills of organization, reorganization and liquidation of entrepreneurial firms and preparation of working documentation, instruments for regulating economic relations among business entities.</p> <p>Competencies: to form students' readiness for entrepreneurial activity and for business organization. Preparation, assessment and implementation of business development projects in various sectors of the economy, collection, analysis and process the data necessary to solve the set of economic tasks in the field of organizing and developing a business. Students will be able to select and apply tools for processing economic data in the field of organization and business management in accordance with the tasks, analyze the results of calculations of economic efficiency and substantiate the conclusions.</p>
Content	<ol style="list-style-type: none"> <li>1. Introduction to the course “Entrepreneurship and Business”</li> <li>2. The essence of business and entrepreneurship. Objectives, functions and generic characteristics of the business</li> <li>3. The system of modern business: subjects of business relations, business infrastructure, governmental support</li> <li>4. Forms of entrepreneurship: small, medium and large</li> <li>5. Registration of an entrepreneurial company</li> <li>6. Organization of an entrepreneurial firm</li> <li>7. Reorganization and termination of the company</li> <li>8. Economic activity in the business system</li> <li>9. Competition in the business field</li> <li>10. Business activities and contracts of the firm</li> <li>11. Tax system in business</li> <li>12. Interests in business</li> <li>13. Entrepreneurial risks</li> <li>14. Innovative entrepreneurship</li> <li>15. Business infrastructure</li> </ol>
Exams and assessment formats	Exams and assessment formats: two oral midterm assessments (20 minutes each) and one final oral exam (40 minutes), homework assignments
Study and examination	Requirements for successfully passing the module

requirements	the final grade in the module is composed of 50% performance on exams, 20% homework assignments, 30% in-class participation. Students must have a final grade of 50% or higher to pass.
Reading list	<ol style="list-style-type: none"> <li>1. Bobrova, O. S. Organizatsiya kommercheskoy deyatelnosti : uchebnik i praktikum dlya srednego professional'nogo obrazovaniya / O. S. Bobrova, S. I. Tsybukov, I. A. Bobrov. – Moskva : Izdatel'stvo Yurayt, 2019. – 332 s.</li> <li>2. Bobrova, O. S. Osnovy biznesa : uchebnik i praktikum dlya akademicheskogo bakalavriata / O. S. Bobrova, S. I. Tsybukov, I. A. Bobrov. – Moskva : Izdatel'stvo Yurayt, 2019. – 330 s.</li> <li>3. Belyy Ye. M. Osnovy sotsial'nogo predprinimatel'stva : uchebnoye posobiye dlya vuzov / Ye. M. Belyy [i dr.] ; pod redaktsiyey Ye. M. Belogo. – Moskva : Izdatel'stvo Yurayt, 2019. – 178 s.</li> <li>4. Bobrova, O. S. Nastol'naya kniga predprinimatel'ya : prakticheskoye posobiye / O. S. Bobrova, S. I. Tsybukov, I. A. Bobrov. – Moskva : Izdatel'stvo Yurayt, 2019. – 330 s.</li> <li>5. Ekonomika malogo i srednego predprinimatel'stva. Uchebnoye posobiye. Avtory: Maydyrova A.B., Ryspekova M.O. – Astana: Yevraziyskiy natsional'nyy universitet im. L. N.Gumileva, 2019 g. – 243 s.</li> </ol> <p>Electronic editions:</p> <ol style="list-style-type: none"> <li>1. Gorfinkel' V. YA. Innovatsionnoye predprinimatel'stvo : uchebnik i praktikum dlya srednego professional'nogo obrazovaniya / V. YA. Gorfinkel' [i dr.] ; pod redaktsiyey V. YA. Gorfinkelya, T. G. Popadyuk. – Moskva : Izdatel'stvo Yurayt, 2019. – 523 s.: <a href="https://urait.ru/book/innovacionnoe-predprinimatelstvo-442427">https://urait.ru/book/innovacionnoe-predprinimatelstvo-442427</a></li> <li>2. Zaramenskikh, Ye. P. Osnovy biznes-informatiki : uchebnik i praktikum dlya bakalavriata i magistratury / Ye. P. Zaramenskikh. – Moskva : Izdatel'stvo Yurayt, 2019. – 407 s.: <a href="https://urait.ru/bcode/433677">https://urait.ru/bcode/433677</a></li> <li>3. Kuz'mina, Ye. Ye. Predprinimatel'skaya deyatelnost' : uchebnoye posobiye dlya srednego professional'nogo obrazovaniya / Ye. Ye. Kuz'mina. – 3-ye izd., pererab. i dop. – Moskva : Izdatel'stvo Yurayt, 2019. – 417 s.: <a href="https://urait.ru/book/predprinimatelskaya-deyatelnost-437823">https://urait.ru/book/predprinimatelskaya-deyatelnost-437823</a></li> <li>4. Repin, V.V. Protsessnyy podkhod k upravleniyu. Modelirovaniye biznes-protsessov / V.V. Repin. - M.: Mann, Ivanov i Ferber, 2013. - 544 c.: <a href="https://www.mann-ivanov-ferber.ru/assets/files/bookparts/the-process-approach-to-management/podhod_read.pdf">https://www.mann-ivanov-ferber.ru/assets/files/bookparts/the-process-approach-to-management/podhod_read.pdf</a></li> <li>5. Burov V. YU., – Osnovy predprinimatel'stva : Chast' III, uchebnoye posobiye : [v 3 ch. / V. YU. Burov; Zabaykal. gos. un-t. – Izd. 2-ye, dop. i pererab. – Chita, ZabGU, 2018.: <a href="http://scipro.ru/conf/%D0%91%D0%A3%D0%A0%D0%9E%D0%92.-%D0%9F%D0%9E%D0%A1%D0%9E%D0%91%D0%98%D0%95.-%D0%A7%D0%90%D0%A1%D0%A2%D0%AC-3.pdf">http://scipro.ru/conf/%D0%91%D0%A3%D0%A0%D0%9E%D0%92.-%D0%9F%D0%9E%D0%A1%D0%9E%D0%91%D0%98%D0%95.-%D0%A7%D0%90%D0%A1%D0%A2%D0%AC-3.pdf</a></li> </ol>

#### **A Module Handbook**

Module designation	General education module <b>Discipline - RUKHANY ZHANGIRU</b>
Semester(s) in which the module is taught	Autumn and spring semesters of the second year of studies
Person responsible for the module	Kairat Battalov
Language	Kazakh, Russian, English
Relation to curriculum	For all bachelor programs, elective component, general education discipline, 1-2 semester of the second year of students
Teaching methods	lecture, project, seminar etc.
Workload (incl. contact hours, self-study hours)	30 hours of lectures, 15 hours of seminars, 105 hours of students' private study including examination and project preparation
Credit points	5
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	The course covers topical issues of modernization of the modern Kazakhstani society. The course is aimed at forming an idea of modern global trends in the post-industrial development of society, a vision of one's own and world future, awareness of the development trend of the



	<p>world labor market, an idea of Kazakhstan's identity, the main directions of the development of the country's spiritual modernization. The course covers basic knowledge of leadership strategies in society. The world examples of leadership in different historical periods are considered. Students know the main trends in the development of modern society, the stages and characteristics of modern globalization, the directions of modernization of the consciousness of citizens, the foundations of leadership in society.</p> <p>Students know how to use the knowledge gained for personal development, increasing the competitiveness of themselves and Kazakhstani society</p> <p>Students are able to determine the priorities of personal and professional development, taking into account the trend of globalization, the growth of competition in the world labor markets.</p>
Content	<p>The education program is based on three conceptual foundations: cognitive – the study of the foundations of modernization of public consciousness and laws of development of modern society; patriotic – respectful attitude to history, heroic past of their people, love for the Fatherland, native land, historical personalities, involvement in national values; informational – popularization of spiritual and moral values that strengthen national identity, clarification of the tasks defined in the Program Article of the Head of State, strategic documents of the country, the President's Address to the people of Kazakhstan. The discipline consists of 3 modules:</p> <p>Module 1. Modernization in the Context of Globalization. The World of the Future.</p> <p>Module 2. Modernization of Consciousness as a Factor in the Success of a Nation.</p> <p>Module 3. Leadership in the Face of Modernization.</p> <p>The module "Modernization in the Context of Globalization. The World of the Future" covers the origins and main stages of globalization, changes in the world in the context of globalization, global trends of the present and the future, the prospects of total digital societies of the future, the prospects of Kazakhstan in the context of globalization, value benchmarks and development trends of the Kazakh society, competitiveness in the modern world, pragmatism in conditions of our time.</p> <p>The module "Modernization of Consciousness as a Factor in the Success of the Nation" the main aspects and problems of the formation of the historical consciousness and worldview of Kazakhstanis, the preservation of sacred monuments of their native land, the importance of preserving tradition for Kazakhstan, modern threats to Kazakhstani identity, the value of knowledge for the development of society, Abai and openness of consciousness, the role of humanity and tolerance in the modern world.</p> <p>The module "Leadership in the Context of Modernization" covers various models and examples of leadership in the world history, the historical significance of the Kazakh steppes in world history, features of leadership in a nomadic society, Alash leadership, N.A. Nazarbayev's initiative as the foundation of global leadership.</p>
Exams and assessment formats	one final oral exam (30 minutes)
Study and examination requirements	Students must have a final grade of 50% or higher to pass
Reading list	<p>Basic references</p> <ol style="list-style-type: none"> <li>1. Nazarbayev N.A. Vzgl'yad v budushcheye: modernizatsiya obshchestvennogo soznaniya // Kazakhstanskaya pravda, 2017. – 12 aprelya</li> <li>2. Nazarbayev N. Era nezavisimosti. – Astana, 2017. – 508 s.</li> <li>3. Obrashcheniye Prezidenta Respubliki Kazakhstan N.A.Nazarbayeva k narodu «Pyat' sotsial'nykh initsiativ Prezidenta» // <a href="http://www.akorda.kz">http://www.akorda.kz</a></li> <li>4. Yuval' Noy Kharrari. „Homo Deus: Kratkaya istoriya budushchego“. – M.: Sindbad, 2018. – 496 s.</li> <li>5. Kuttykadam S. «10 primerov sluzheniya natsii». – Almaty: INES-</li> </ol>

	<p>TSA, 2009. 356s.</p> <ol style="list-style-type: none"> <li>6. Abay Kunanbayev. <i>Izbrannoye (seriya «Mudrost' vekov»)</i>, Moskva, 2006</li> <li>7. Memleket basshysynyn 2017 zhylgy 31 kantardagy «Kazakstannyn yshinshi zhangyruy: zhakhandyk basekege k,–kabiletilik» atty Kazakstan khalkyna Zholdauy // <a href="http://www.akorda.kz">http://www.akorda.kz</a></li> <li>8. Nazarbayev N. <i>Tarikh tolkynynda</i>. - Almaty: «Atamura», 1999</li> <li>9. «Kazakstan-2050» Strategiyasy kalyptaskan memlekettin zhana sayasi bagyty. <i>Kazakstan Respublikasynyn Prezidenti – Yelbasy N.A. Nazarbayevtyñ Kazakstan khalkyna Zholdauy</i>, Astana k., 2012 zhylgy 14 zheltoksan // <a href="http://adilet.zan.kz/kaz/docs/K1200002050">http://adilet.zan.kz/kaz/docs/K1200002050</a></li> <li>10. Ukaz Prezidenta Respubliki Kazakhstan „O perevode alfavita kazakhskogo yazyka s kirillitsy na latinskuyu grafiku“ (s izmeneniyami ot 19.02.2018 g.) Astana, Akorda, 26 oktyabrya 2017 goda No 569 (Alfavit kazakhskogo yazyka, osnovanny na latinskoy grafike, izlozhen v redaktsii Ukaza Prezidenta RK ot 19.02.18 g. No 637) // <a href="http://online.zakon.kz/Document/?doc_id=33613600">http://online.zakon.kz/Document/?doc_id=33613600</a></li> <li>11. Poslaniye Prezidenta Respubliki Kazakhstan N.Nazarbayeva narodu Kazakhstana. «Novyye vozmozhnosti razvitiya v usloviyakh chetvortoy promyshlennoy revolyutsii» 10 yanvarya 2018 g. // <i>Kazakhstanskaya pravda</i>, 2018. – 10 yanvarya</li> <li>12. Poslaniye Prezidenta Respubliki Kazakhstan N.Nazarbayeva narodu Kazakhstana. «Tret'ya modernizatsiya Kazakhstana: global'naya konkurentosposobnost'» 31 yanvarya 2017 g. // <i>Kazakhstanskaya pravda</i>, 2017. – 31 yanvarya</li> <li>13. Nazarbayev N. V potoke istorii.-Almaty: «Atamura», 1999 Strategiya Kazakhstan-2050: novyy politicheskiy kurs sostoyavshegosya gosudarstva.</li> <li>14. Kunanbayev A. <i>Shykarmalarynyk tolyk zhinagy (eki tomdyk)</i> – Almaty, 2002</li> <li>15. Schwab Klaus <i>Turtinshi industrial revolution</i>. – Almaty: Ultytk audarma byurosy, 2018. – 200 b. (9-13 bb.)</li> <li>16. Yesim G. <i>Khakim Abay</i>. – Almaty, 1994</li> <li>17. <i>Kazakhstani zalpyul'ttyk Kasietti nysandary / Sacred objects of Kazakhstan of national importance</i>. – Astana: Folio, 2017.- 496 b.</li> <li>18. <i>Kazakstannyk Kirlik Kasietti nysandary / Regional sacred objects of Kazakhstan</i>.- Astana: Folio, 2017.- 504 b.</li> <li>19. <i>Kazakstanday 100 zhana esim zhobasy / Project of 100 new faces of Kazakhstan</i> // <a href="http://100esim.el.kz/kz">http://100esim.el.kz/kz</a></li> <li>20. Zhabaikhon Abdildin, Raushan Abdildin. <i>The logic of evolutionary development</i> // <i>Kazakhstanskaya Pravda</i>. – 2017. – May 16</li> <li>21. Remy Hess <i>Philosophical tadauly 25 kitaby</i>. – Almaty: ul'ttyk audarma burosy, 2018</li> <li>22. Johnston D. <i>Philosophical qysgasha tarikhy: Socrattan Derridana deyin</i>. – Almaty: „Ul'ttyk audarma burosy“ Kokamdyk kory, 2018.- 2016 beta</li> <li>23. Alan Barnard <i>Anthropology of tarikhy men theory</i>. – Almaty: Ul'ttyk audarma burosy, 2018.</li> <li>24. Ter-minasova, S.G. <i>Til zhune medenietarly communication</i>. – Almaty; Astana, 2018</li> </ol> <p>Additional references</p> <ol style="list-style-type: none"> <li>1. Lutfur Rahman <i>Modernization Theory: A Critical Analysis</i> // <a href="http://www.academia.edu/8374391/Modernization_Theory_A_Critical_Analysis">http://www.academia.edu/8374391/Modernization_Theory_A_Critical_Analysis</a></li> <li>2. Huntington S.P. <i>The Change to Change: Modernization, Development, and Politics</i> // <i>Comparative Modernization: A Reader</i>. Ed. By C.E.Black. – N.Y., London, 1976. – P. 28;</li> <li>3. A.Y. <i>Social Change and Development: Modernization, Dependency, and World-System Theories</i>. Newbury Park, 1990. P.18-23</li> <li>4. Khantington E. <i>Politicheskiy poryadok v menyayushchemsya obshchestve</i>. – M., 2004.</li> </ol>
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	<p>5. Shtompka P. Sotsiologiya sotsial'nykh izmeneniy. – M., 1996. – S. 178</p> <p>6. Ingikhart, R. Modernizatsiya i postmodernizatsiya // Novaya postindustrial'naya volna na Zapade. Antologiya. – M., 1999. – S. 267-268.</p> <p>7. Giddens E. Posledstviya moderniti // Novaya postindustrial'naya volna na Zapade. Antologiya. – M., 1999. – S. 101-122</p> <p>8. Sydykov Ye.B. Modernizatsiya obshchestvennogo soznaniya i novyye zadachi istoricheskoy nauki // el.kz/news/ruhani-zhangyru/</p>
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#### **A Module Handbook**

Module designation	Module of economic, organizational and managerial competencies/ Discipline- Digital Technologies by Industries
Semester(s) in which the module is taught	3/4
Person responsible for the module	Russian languages Akhayeva Zh. B., Abildinova G. M. Kazakh languages - Alzhanov A. K., Shyndaliev N. T., Sadvakasova A. K.
Language	Russian, Kazakh languages
Relation to curriculum	optional components
Teaching methods	2 lectures and 1 seminar per week – contact hours
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. 30 hours of lectures, 15 hours of seminars, 105 hours self-study Internet without wires. – wireless
Credit points	5
Required and recommended prerequisites for joining the module	“Information and Communication Technologies” course
Module objectives/intended learning outcomes	<p>Knowledge:</p> <ul style="list-style-type: none"> <li>– to learn the basic concepts of digital technologies, platforms and mobile devices;</li> <li>– to know the features of the use of multimedia on the Internet;</li> <li>– to be able to effectively use digital technologies and Internet resources;</li> <li>– to develop multimedia content;</li> <li>– to use the functionality of social networks;</li> <li>– to use various means of processing and storing digital information;</li> <li>– to analyze the reliability of means and methods of security in the network;</li> </ul> <p>Competencies:</p> <ul style="list-style-type: none"> <li>– to formation of students' skills and abilities necessary for their further professional activity;</li> <li>– to evaluate the effectiveness of digitalization in professional areas.</li> <li>– to synthesize the effective use of Internet services for work and life;</li> </ul>
Content	<p>1. Introduction to the course. State program “Digital Kazakhstan”.</p> <p>2. Smart City. Basic concepts. Organization platforms and technologies. Smart Astana roadmap.</p> <p>3. Computer networks. The Internet. Internet access technologies. Internet by wire. Internet without wires. Mobile Internet. Mobile networks (3G, 4G / LTE). Cellular systems.</p> <p>4. Digital platforms for e-government services. Electronic digital signatures (EDS).</p> <p>5. “E-licensing” information system. Digital e-commerce platforms. Electronic commerce. Virtual payment facilities and systems. Internet shops. Online shopping.</p> <p>6. Information security on the Internet. Cybersecurity. Strong passwords. 2-step authentication</p> <p>7. 3D modeling and animation. 3D graphics. 3D modeling.</p> <p>8. Virtual and augmented reality VR and AR.</p> <p>9. Introduction to Java. Java programming language.</p> <p>10. Acquaintance with the Python programming language.</p> <p>11. Processing of digital information in the professional field. Organization of texts, transformation of text information. Processing of</p>

	<p>graphic images. Compression of digital information.</p> <p>12. Database. Big data and open data</p> <p>13. Statistical processing of results by means of STATISTICA software.</p> <p>14. Modern multimedia services. Social networks. Search engines. Electronic catalogs, libraries. Video conferences.</p> <p>15. Application of cloud technologies for storing digital information. General concepts of cloud technologies. Advantages and disadvantages of cloud services.</p>
Exams and assessment formats	<p>The control of the boundaries is carried out in a test form, which involves the completion of 20 test tasks. For the final control, 40 questions from the test database are submitted, the result is set as a percentage (from 0 to 100%, that is, 100% is 40 correct answers to questions).</p>
Study and examination requirements	<p>Discipline requirements: mandatory attendance of classroom classes, active participation in the discussion of issues, preliminary preparation for lectures and laboratory (practical) classes, high-quality and timely performance of self study tasks, participation in all types of control.</p> <p>For the final control, 40 questions from the test database are submitted, the result is set as a percentage (from 0 to 100%, that is, 100% is 40 correct answers to questions). The answer to each test task is given 1.5 minutes. The response time for disciplines that involve solving problems (mathematical, physical, etc.) is increased to 2 minutes. Boundary control in the form of test tasks involving the development of the course in sections from 1 to 7 weeks, as well as from 8 to 15 weeks.</p>
	<ol style="list-style-type: none"> <li>1. Serik M., Sadvakasova A.K., Senbai D. Bulttyk tehnologiyalar negizdery: oku kuraly. – Astana, 2017. – 111b.</li> <li>2. Zhumagulova S.K. Akparattyk kauipsizdik zhane akparatty korgau. – Almaty, 2017.</li> <li>3. Yermekov N.T. Akparattyk tehnologiyalar: okulyk / Nurmukhambet Turlynuly Yermekov; Kazakstan Respublikasy Bilim zhane gylym ministrlygi tehnikalyk zhane kasiptik bilim beru uyimdaryna usynady. – 2-shi bas.. – Astana: Foliant, 2011. – 206, [2] b.: sur.. – (Kasiptik bilim). – 1000 ekz. – ISBN 978-601-271-045-5</li> <li>4. Seitbekova G.O. Akparattyk tehnologiyalar: zhogary oku oryndaryna amalghan oku kuraly / G.O. Seitbekova, G.A. Tiulepberdinova. – Almaty: Evero, 2015. – 251, [1]b.: sur.. – Bibliogr.: b. 248. – ISBN 978-601-240-854-6</li> <li>5. Aljanov A.K. Multimediyne tehnologii v obrazovanii: [uchebno-metodicheskoye posobiye] / A.K. Aljanov, G.M. Abildinova. – Almaty: Evero, 2016. – 94, [1] c.: sv. il.. – Bibliogr.: s. 94. – ISBN 978-601-310-240-5</li> <li>6. Serik M., Shyndaliyev N.T., Zulpykhar Zh.E. Kompyuter arkhitekturasyny zhane zhuyine akimshiliklendiryu. –Astana, 2012.</li> </ol>
Reading list	<ol style="list-style-type: none"> <li>7. Serik M., Sadvakasova A.K., Senbai D. Bulttyk tehnologiyalar negizdery: oku kuraly. – Astana, 2017. – 111b.</li> <li>8. Zhumagulova S.K. Akparattyk kauipsizdik zhane akparatty korgau. – Almaty, 2017.</li> <li>9. Yermekov N.T. Akparattyk tehnologiyalar: okulyk / Nurmukhambet Turlynuly Yermekov; Kazakstan Respublikasy Bilim zhane gylym ministrlygi tehnikalyk zhane kasiptik bilim beru uyimdaryna usynady. – 2-shi bas.. – Astana: Foliant, 2011. – 206, [2] b.: sur.. – (Kasiptik bilim). – 1000 ekz. – ISBN 978-601-271-045-5</li> <li>10. Seitbekova G.O. Akparattyk tehnologiyalar: zhogary oku oryndaryna amalghan oku kuraly / G.O. Seitbekova, G.A. Tiulepberdinova. – Almaty: Evero, 2015. – 251, [1]b.: sur.. – Bibliogr.: b. 248. – ISBN 978-601-240-854-6</li> <li>11. Aljanov A.K. Multimediyne tehnologii v obrazovanii: [uchebno-metodicheskoye posobiye] / A.K. Aljanov, G.M. Abildinova. – Almaty: Evero, 2016. – 94, [1] c.: sv. il.. – Bibliogr.: s. 94. – ISBN 978-601-310-240-5</li> <li>12. Serik M., Shyndaliyev N.T., Zulpykhar Zh.E. Kompyuter arkhitekturasyny zhane zhuyine akimshiliklendiryu. –Astana, 2012.</li> </ol> <p>Electronic editions:</p> <ol style="list-style-type: none"> <li>1. Luchaninov D.V. Osnovy razrabotki web-saytov obrazovatel'nogo naznacheniya [Elektronnyy resurs]: uchebnoye posobiye / D.V.</li> </ol>

	<p>Luchaninov. – Elektron. tekstovyye dannyye. – Saratov: Ay Pi Er Media, 2018. – 105 c. – 978-5-4486-0174-3. – Rezhim dostupa: <a href="http://www.iprbookshop.ru/70775.html">http://www.iprbookshop.ru/70775.html</a></p> <p>2. Kurushin V.D. Graficheskiy dizayn i reklama [Elektronnyy resurs] / V.D. Kurushin. – Elektron. tekstovyye dannyye. – Saratov: Profobrazovaniye, 2017. – 271 c. – 978-5-4488-0094-8. – Rezhim dostupa: <a href="http://www.iprbookshop.ru/63814.html">http://www.iprbookshop.ru/63814.html</a></p> <p>3. Shan'gin V.F. Zashchita komp'yuternoy informatsii. Effektivnyye metody i sredstva [Elektronnyy resurs] / V.F. Shan'gin. – Elektron. tekstovyye dannyye. – Saratov: Profobrazovaniye, 2017. – 544 c. – 978-5-4488-0074-0. – Rezhim dostupa: <a href="http://www.iprbookshop.ru/63592.html">http://www.iprbookshop.ru/63592.html</a></p> <p>4. Vel'ts O.V. Informatika [Elektronnyy resurs] : laboratornyy praktikum / O.V. Vel'ts, I.P. Khvostova. – Elektron. tekstovyye dannyye. – Stavropol': Severo-Kavkazskiy federal'nyy universitet, 2017. – 197 c. – 2227-8397. – Rezhim dostupa: <a href="http://www.iprbookshop.ru/69384.html">http://www.iprbookshop.ru/69384.html</a></p> <p>5. Kovalenko YU.V. Informatsionno-poiskovyye sistemy [Elektronnyy resurs]: uchebno-metodicheskoye posobiye / YU.V. Kovalenko, T.A. Sergiyenko. – Elektron. tekstovyye dannyye. – Omsk: Omskaya yuridicheskaya akademiya, 2017. – 38 c. – 978-5-98065-148-0. – Rezhim dostupa: <a href="http://www.iprbookshop.ru/66817.html">http://www.iprbookshop.ru/66817.html</a></p> <p>6. Osnovy Web-tekhnologiy [Elektronnyy resurs]: uchebnoye posobiye / P.B. Khramtsov [i dr.]. – Elektron. tekstovyye dannyye. – Moskva, Saratov: Internet-Universitet Informatsionnykh Tekhnologiy (INTUIT), Vuzovskoye obrazovaniye, 2017. – 375 c. – 978-5-4487-0068-2. – Rezhim dostupa: <a href="http://www.iprbookshop.ru/67384.html">http://www.iprbookshop.ru/67384.html</a></p> <p>Information security on the Internet. Cybersecurity. Cyber shield of Kazakhstan. Strong passwords. Two-step authentication. CCNAv7: Bridging Netcad.com</p>
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#### A Module Handbook

Module designation	Module of general education Discipline Anti-Corruption Culture
Semester(s) in which the module is taught	3 semester
Person responsible for the module	Russian – Kapsalyamova S.S. Kazakh – Osmanova D.B.
Language	Russian, Kazakh
Relation to curriculum	elective component
Teaching methods	Verbal, visual, practical, inductive and deductive (according to the logic of presentation and perception of educational material)
Workload (incl. contact hours, self-study hours)	Contact 45 hours: lessons 30 hours, practical seminars 15 hours. Total 150 hours: lectures 30, seminars 15, students' independent work 105.
Credit points	5
Required and recommended prerequisites for joining the module	Not required
Module objectives/intended learning outcomes	<p>Key question: corruption, the essence of corruption, anti-corruption policy</p> <p>Students:</p> <ul style="list-style-type: none"> <li>- will have knowledge of the essence of corruption and the reasons for its origin;</li> <li>- will be able to analyze the measure of moral, ethical and legal responsibility for corruption offenses;</li> <li>- will have knowledge of the state's anti-corruption policy and current anti-corruption legislation;</li> <li>- will be able to implement the values of moral consciousness and follow moral norms in daily practice;</li> <li>- will be able to determine lawful action in a situation of conflict of interest.</li> </ul>

<i>Content</i>	<ol style="list-style-type: none"> <li>1. General Concept Of Corruption</li> <li>2. Legislation Of The Republic Of Kazakhstan On Combating Corruption</li> <li>3. Positive anti-corruption trends</li> <li>4. Measures To Combat Corruption</li> <li>5. Foreign experience in combating corruption</li> <li>6. The role of the family in anti-corruption education personality culture</li> <li>7. National foundations of anti-corruption culture</li> <li>8. Public control as a countermeasure Corruption</li> <li>9. Political parties and the media as tools of formation anti-corruption culture</li> <li>10. Anti-corruption education and upbringing</li> <li>11. The psychological mechanism of corrupt behavior</li> <li>12. The anti-corruption aspect of reforming the state service</li> <li>13. State planning as a countermeasure corruption</li> <li>14. Improving the process of providing public services</li> <li>15. Formation of anti-corruption awareness in business environment</li> </ol>
<i>Exams and assessment formats</i>	Computer testing; tests are developed by the lecturer in advance and are entered into the program in AIS "Platonus". Each test question has several answers, students must choose one correct answer. One minute is allotted for each question, after which the program switches to the next question. Returning to the previous question is impossible. There are 40 questions per student. The test result is known to the student immediately after its completion. A retake is permitted once upon receipt of an FX score.
<i>Study and examination requirements</i>	Requirements for successfully passing the module the final grade in the module is composed of 50% performance on exams, 20% homework assignments, 30% in-class participation. Students must have a final grade of 50% or higher to pass.



Reading list	<ol style="list-style-type: none"> <li>1. Osnovy antikorrupsionnoy kul'tury: uchebnoye posobiye. Pod obshchey redaktsiyey d. b. n., professora B.S. Abdrasilova. – Astana: Akademiya gosudarstvennogo upravleniya pri Prezidente Respubliki Kazakhstan, 2016. – 176 s.</li> <li>2. Protivodeystviye korruptsii. Uchebnik i praktikum. Pod obshchey redaktsiyey Ye.V.Okhotskogo. – Moskva, 2016.</li> <li>3. Protivodeystviye korruptsii: konstitutsionno-pravovyye podkhody. Kollektivnaya monografiya\ otv. Avak'yan S.A – M.: Yustitsinform, 2016. – 512s.</li> <li>4. Rouz-Akkeman S. Korruptsiya i gosudasrstvo. Prichiny, sledstviya, reformy. M.: Logos, 2010.</li> </ol> <p>Additional references:</p> <ol style="list-style-type: none"> <li>1. Antikorrupsionnaya pravovaya politika: ucheb. posobiye / Ye. Alaukhanov. – Almaty: Zan adeviyeti, 2009. – 256 s.</li> <li>2. Nравstvennost' kak osnova stanovleniya novoy generatsii gosudarstvennykh sluzhashchikh. / Kabykenova B.S., Shakhanov Ye.A., Dzhusupova R.S./ 2011.</li> <li>3. Byurokratiya, korruptsiya i effektivnost' gosudarstvennogo upravleniya / V. D.Andrianov. - M.: Volters Kluver, 2009. - 248 s. - Bibliogr.: 234 s.</li> <li>4. Korruptsiya i gosudarstvo: Prichiny, sledstviya, reformy: Per. s angl. O.A.Alyakrinskogo / S. Rouz-Akkerman. – M.: Logos, 2003. - 356 s.</li> <li>5. Boleyev T.K. Psikhologicheskiye mekhanizmy korruptsionnogo povedeniya// Gosudarstvennoye upravleniye i gosudarstvennaya sluzhba. – №1. – 2015.</li> <li>6. Protivodeystviye korruptsii i uluchsheniye standartov gosudarstvennykh uslug: opyt Novoy Zelandii, Avstraliya i Malayzii. - London: DAI, 2006</li> <li>7. Vlast', korruptsiya i chestnost': Nauch. izd.: Per. s angl. / A. A. Rogou. – M.: Izd-vo RAGS, 2005. – 176 s. (Antologiya zarubezh. i otech. mysli)</li> <li>8. «Belovorotnichkovaya» prestupnost' v SSHA cherez prizmu mirovogo finansovo-ekonomicheskogo krizisa: Monogr. /O. G. Karpovich, N. A. Shulepov. – M.: YUNITI-DANA, 2014. – 207 s. - Bibliogr.: 195 s.</li> <li>9. Aktual'nyye problemy bor'by s korruptsiyey v Respublike Kazakhstan / O.A. Abdykarimov. – Astana: Akad. gos. upr. pri Prezidente RK, 2005. – 19 s.</li> <li>10. Korruptsiya kak sotsial'noye yavleniye i mery yeyo preduprezhdeniya: Ucheb. posobiye. /G. S. Maulenov. - Astana: Akad. gos. sluzhby pri Prezidente RK, 2005. - 96 s.</li> <li>11. Alekseyev S. V. Korruptsiya: sotsiologicheskii analiz / pod red. O. V. Bondarenko.– Shakhty: Izd-vo YURGUES, 2008. – 270 s.</li> <li>12. Dobren'kov V. I., Ispravnikov N. R. Korruptsiya: sovremennyye podkhody k issledovaniyu. – M., 2009. – 207 s.</li> <li>13. Bayrkenova G. O formirovani pravovoy antikorrupsionnoy kul'tury obuchayushchikhsya vysshikh uchebnykh zavedeniy. Vysshaya shkola Kazakhstana. 2015. №1. – S.85-88.</li> <li>14. Bayrkenova G. Vzaimnaya obuslovlennost' pravovoy i antikorrupsionnoy kul'tury. «Dukhovno-nravstvennoye vospitaniye molodezhi v usloviyakh globalizatsii sovremennogo obshchestva», posvyashchennaya 25-letiyu Nezavisimosti Respubliki Kazakhstan»: mat-ly mezhdunarodnoy. nauch.-prakt. konf. – Ust'-Kamenogorsk, VKGU imeni S. Amanzholova, TOO «VK PK ARGO» 2017. – S.55-59.</li> <li>15. Bayrkenova G. Antikorrupsionnoye vospitaniye molodezhi v svete gosudarstvennoy antikorrupsionnoy politiki. Sbornik materialov mezhdunarodnoy nauchno-prakticheskoy konferentsii, posvyashchennoy 25-letiyu fakul'teta ekonomiki i prava «Obshchestvo, gosudarstvo, pravo, ekonomika: problemy vzaimodeystviya v sovremennom mire». – Oskemen: S.Amandolov atyndagy SKSU baspasy, 2017. – S.3-5.</li> </ol>
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## A Module Handbook

Module designation	General education module <b>Discipline- Fundamentals of Ecology and Life Safety</b>
Semester(s) in which the module is taught	4
Person responsible for the module	Zhantokov B.Zh., Rakhisheva A.D.
Language	Kazakh, Russian, English
Relation to curriculum	General education discipline elective component, elective component
Teaching methods	<u>Lecture</u> : Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture <u>Seminar assignments (practice)</u> : Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work <u>SIW tasks</u> : Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized
Workload (incl. contact hours, self-study hours)	Lectures 30 / Seminars 15 / SIW 105 (students' independent work). Total: 150 hours.
Credit points	5
Required and recommended prerequisites for joining the module	To effectively master the content of the discipline, it is necessary to know the geography, chemistry, biology, physics, general ecology in the scope of the school curriculum
Module objectives / intended learning outcomes	<b>The goal</b> is to equip future specialists with theoretical knowledge and practical skills necessary to create safe and harmless living conditions; forecasting and making competent decisions in emergency situations to protect the population and production personnel of national economy facilities from the possible consequences of accidents, catastrophes, natural disasters and the use of modern means of destruction, as well as during the elimination of these consequences. Know-imagine the conditions of human existence in a safe environment and negative environmental factors; <b>To know</b> : to imagine the conditions of human existence in a safe environment and negative environmental factors; <b>To be able</b> : to recognize threats, their types, place, possible consequences, the amount of harm, the possibility of a threat, etc.; to apply the knowledge gained in practice and take qualified actions in the event of a danger and emergency. <b>To have skills</b> : to act in emergency situations of peace and wartime, to carry out rescue and other urgent work in the elimination of the consequences of accidents, environmental disasters, natural disasters and the use of modern means of destruction.
Content	The academic course is aimed at studying the ways of safe human interaction with the environment, global changes in the environment and strategies for the survival of mankind. Sustainable functioning of economic facilities in emergency situations, issues of prevention and elimination of the consequences of natural and man-made emergencies, as well as the use of modern means of destruction. <b>Lesson topics</b> : 1. Environmental safety is one of the main strategic components of the national security of the Republic of Kazakhstan. Classic lecture. 2. Kazakhstan as an environmental disaster zone. Classic lecture. 3. Environmental pollution as the main factor of environmental danger. Classic lecture. 4. Changes in the quality of the environment and their consequences. Classic lecture. 5. Radiation situation in the Republic of Kazakhstan and problems related to radiation. Classic lecture.



<i>Exams and assessment format</i>	<i>During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare. The exam duration is 40 minutes</i>
<i>Study and examination requirements</i>	<p><i>The exam on the subject of Fundamentals of Ecology and Life Safety is taken orally.</i></p> <p><i>Because:</i></p> <p><i>First of all, in order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication.</i></p> <p><i>Second, the third question of the exam questions of this discipline can be assessed in the form of calculations, and it can be assessed only by asking the meaning of oral formulas.</i></p> <p><i>Thirdly, I think that only the oral exam method allows you to fully assess the knowledge of students (for example, to ask additional questions).</i></p> <p><i>The minimum score for completing the course is 50 points. To successfully complete the course, the student must score above 70 points</i></p>
<i>Reading list</i>	<ol style="list-style-type: none"> <li><i>1. Khotuntsev YU.L. Ekologiya i ekologicheskaya bezopasnost'. – M.: Akademiya, 2002.</i></li> <li><i>2. Baytuganova M.O. Okhrana truda i bezopasnost' zhiznedeyatel'nosti. – Almaty: Evero, 2019.</i></li> </ol>

#### **A Module Handbook**

<i>Module name</i>	<i>General education module</i>
<i>Module level (if available)</i>	<i>GCD EC</i>
<i>Code (if available)</i>	<i>EDUC 21001</i>
<i>Subtitle (if available)</i>	<i>-</i>
<i>Course (if available)</i>	<i>Akademic rhetoric</i>
<i>Semester(s) when the module is taught</i>	<i>4</i>
<i>Person responsible for the module</i>	<i>Shakhin A.A., Tashimkhanova D.S.</i>
<i>Lecturer</i>	<i>Shakhin A.A., Tashimkhanova D.S.</i>
<i>Language of instruction</i>	<i>Kazakh / Russian</i>
<i>Within the curriculum</i>	<i>General education module, elective component</i>
<i>Teaching type, contact hours</i>	<i>2 лекции и 1 практическое в неделю – контактные часы</i>
<i>Hours</i>	<i>Lectures 30 / Seminars 15 / SIW 105 (students' independent work)</i>
<i>ECTS number</i>	<i>5</i>
<i>Exam requirements</i>	<i>The combined exam consists of 25 exam cards with two questions. The first question is taking a test in the SOCRATIV program, where students solve 40 questions; the second question is an oral answer to a given topic. The list of topics for oral answers is given to students in advance for preparation.</i>
<i>Pre-requisites</i>	<i>Russian / Kazakh</i>
<i>Module objectives / intended learning outcomes</i>	<p><i>The goal is to develop skills for effective public speaking, skills of successful communication in various situations of business communication.</i></p> <p><i>Know the main rhetorical strategies and tactics, methods of argumentation aimed at achieving a communicatively meaningful result.</i></p> <p><i>Be able to apply knowledge about the oratorio to the speech facts of business communication; to build effective business communication in accordance with students' own communicative intentions.</i></p> <p><i>Have the skills of effective interaction with participants in the business communication process in various genres of business communication.</i></p>

<p><i>Content</i></p>	<p><i>The course has a professional and practical focus. Its study presupposes mastering the technology of rhetorical activity in professionally significant situations. The objectives of the course include increasing students' speech education, acquiring knowledge about the principles of effective business communication, main factors and processes that ensure the successful impact of public speech on listeners, the forms and means of interaction between the speaker and the audience.</i></p> <p><i>The student gains knowledge of the basic rhetorical strategies and tactics aimed at achieving a communicatively meaningful result; the basics of public speaking skills; knowledge of the terminological apparatus according to the course; the ability to produce tests of an official business orientation, to be aware of one's own communicative intentions and to build effective business communication in accordance with this.</i></p>
<p><i>Requirements for training and exams, exam forms</i></p>	<p><i>The course "Business Rhetoric" is an optional discipline. The student must complete the assigned tasks in a strictly established timeframe, which applies both to classroom work and to the implementation of students' independent work.</i></p> <p><i>Being late for classes is not welcome. A student who is missing classes or does not complete the assignment is not allowed to take the exam.</i></p> <p><i>Attendance in classrooms is compulsory; absences can only be for a valid reason. All missed classes are worked out in the form of completing individual assignments, preparing presentations, etc.</i></p> <p><i>The exam form is a combined exam.</i></p>
<p><i>Media used</i></p>	<p><i>Course " Rhetoric"</i></p> <p><a href="https://www.youtube.com/playlist?list=PLo9UMekjzF143NI5PXNc4-1UrvIzCaivZ">https://www.youtube.com/playlist?list=PLo9UMekjzF143NI5PXNc4-1UrvIzCaivZ</a></p> <ol style="list-style-type: none"> <li>1. <i>Kazakhstan School of Public Speaking and Personal Growth</i> <a href="https://mediaprofi.kz/orator/">https://mediaprofi.kz/orator/</a></li> <li>2.</li> <li>3. <i>Online Rhetoric courses:</i></li> <li>4. • 1 HEDU</li> <li>5. • 2 Udemy</li> <li>6. • 3 Alexey Sobolev School of Public Speaking</li> <li>7. • 4 Skillbox</li> <li>8. • 5 Online School of Effective Communication</li> <li>9. • 6 PMClub</li> <li>10. • 7 "THE KING SPEAKS!"</li> <li>11. • 8 MBA City Academy</li> <li>12. • 9 New Business University</li> <li>13. • 10 4brain</li> <li>14. • 11 " Look. Learn"</li> <li>15. • 12 Oratoris</li> <li>16. • 13 Oratorus</li> <li>17. * 14 Moscow School of Speakers</li> <li>18. • 15 "Learning to speak publicly"</li> <li>19. • 16 Public Speaking School</li> <li>20. * 17 Online courses from Oleg Kot</li> <li>21. * 18 School of Mental Acuity</li> <li>22. • 19 Free Online Courses</li> <li>• * 20 University of Public Speaking and Rhetoric</li> </ol>

References	<ol style="list-style-type: none"> <li>1. Sternin I.A. <i>Prakticheskaya ritorika: ucheb. posobiye dlya studentov vysshikh uchebnykh zavedeniy.</i> – M.: «Akademiya», 2016. – 272 s.</li> <li>2. Shelamova G.N. <i>Etiket delovogo obshcheniya: ucheb. posobiye dlya nach. prof. obrazovaniya.</i> – M.: "Akademiya", 2015. – 192 s.</li> <li>3. Vvedenskaya L.A. <i>Delovaya ritorika: Uchebnoye posobiye dlya vuzov.</i> – Rostov n/D, 2012.</li> <li>4. Mal'khanova I.A. <i>Delovoye obshcheniye: ucheb. posobiye.</i> – M.: Akademicheskiy Proyekt, 2014. – 224 s.</li> <li>5. Anisimova T.V., Gimpel'son Ye.G. <i>Sovremennaya delovaya ritorika: ucheb .posobiye.</i> – M. : NPO «MODEK», 2017. – 432 s.</li> <li>6. Golub I.B. <i>Ritorika: ucheb. posobiye.</i> – M.: «Eksmo», 2015.– 384 s. Kuzin F.A. <i>Kul'tura delovogo obshcheniya.</i> – M., 2017.</li> </ol>
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#### **A Module** BIOL 22002 General biological disciplines module

Module designation	Microbiology
Semester(s) in which the module is taught	5
Person responsible for the module	Aigul Dinmukhamedova
Language	Russian, Kazakh
Relation to curriculum	Compulsory Virology, Biophysics, Plant physiology
Teaching methods	Lecture (interactive method, communicative method, llab works (works in group, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Seminars - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Chemistry; Cytology and Histology; Biochemistry
Module objectives/intended learning outcomes	<p>To teach students the features of prokaryotes, their physiology and biochemistry, to show the general biological and practical significance, to determine the relationship of microbiology with other disciplines, to emphasize the ideological and socio-ethical significance of discoveries in the field of microbiology.</p> <p>As a result of studying the discipline, students should <b>know</b>: about the world of microbes, their place in nature, the main properties of microorganisms and viruses, the principles of their classification, ecology, role in nature and human life.</p> <p><b>Be able to</b>: set up demonstration experiments, carry out sanitary measures, use microorganisms as objects of scientific research.</p> <p><b>Possess the skills</b> of isolation and cultivation of microorganisms, microbiological analysis of water and soil, compliance with the requirements for microorganisms.</p>
Content	History and development of microbiology. Subject and methods of microbiology. Diversity of the microbial world - the structure and function of prokaryotic and eukaryotic microorganisms. Cultivation and growth. Metabolism: energy and biosynthetic processes. Regulation of metabolism. Heredity and variability of microorganisms. The relationship of microorganisms with micro and macroorganisms. Environmental factors affecting microorganisms. Systematics of microorganisms.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass

Reading list	<p>1. Shigaeva M.Kh. General microbiology: textbook for universities / M. Kh. Shigaeva, V. L. Tsyu; Ministry of Education and Science of the Republic of Kazakhstan. Kazakh National University named after Al-Farabi. - Almaty: Kazakh un-ti, 2008. -- 320 p. (in Kazakh)</p> <p>2. Saparbekova A.A. Microbiology and virology. Almaty: Epigraph, 2016. -187p.</p> <p>3. Steinier, R. The world of microbes: in 3 volumes / R. Steinier, E. Edelberg, J. Ingram. - M.: Mir, 1979 (in Russian)</p> <p>4. Dinmukhamedova A.S. Microbiology: textbook / Ministry of Education and Science of the Republic of Kazakhstan, L.N. L.N. Gumilyov Eurasian National University. - Almaty: SSK, 2019. – 179p. . (in Kazakh)</p> <p>5. Emtsev V.T., Mishustin E.N. Microbiology: textbook. for stud. universities. - 6th ed., Rev. - M.: Bustard, 2006. -- 445 p. (in Russian)</p> <p>6. Persing, David H. Molecular Microbiology : Diagnostic Principles and Practice. Ed.: 3rd ed. Washington, DC : ASM Press. 2016</p>
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**A Module** BIOL 22002 General biological disciplines module

Module designation	Virology
Semester(s) in which the module is taught	5
Person responsible for the module	Aigul Dinmukhamedova
Language	Russian, Kazakh
Relation to curriculum	Compulsory Microbiology, Biophysics, Plant physiology
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Practical Classes - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Chemistry; Cytology and Histology; Biochemistry
Module objectives/intended learning outcomes	<p>The purpose of the discipline "Virology" is to master the theoretical foundations of virology and acquire knowledge and skills in the prevention and diagnosis of viral diseases.</p> <p>In the course of studying the discipline, students should <b>know</b>: the structure of viruses, the stages of interaction of viruses with host cells, the classification of viruses, the main types of viruses that are pathogenic to humans; epidemiological features of viral infections with various transmission mechanisms, methods of laboratory diagnostics of viral infections;</p> <p><b>be able to</b>: use methods for diagnosing viral infections, evaluate the results of virological studies, plan the course of research depending on the intended goal.</p> <p><b>the pathogen of viral infections</b>; knowledge of serological research skills in the diagnosis of viral infections, skills of working with PCR equipment to determine the RNA or DNA of viruses for their indication</p>
Content	The history of the development of virology. Morphology and structure of viruses. Interaction of viruses with the host cell. Cultivation of viruses. Taxonomy of viruses. Reproduction of viruses. Features of antiviral immunity and pathogenesis viral diseases. Prevention, principles of diagnosis and treatment of viral diseases. RNA viruses. DNA viruses.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass

Reading list	<p>1. Stamkulova A.A., Kudaibergenuly K.K., Ramazanova B.A. "General and individual virology". Educational-methodical manual. -Almaty. - 2010 - 380 p. (in Kazakh)</p> <p>2. Microbiology and virology : educational manual / I.S. Savitskaya, A.S. Kistaubayeva, L.V. Ignatova, I.V. Blavachinskaiya ; Kazakh national university after al-Farabi. - Almaty : Kazakh University, 2014. - 156</p> <p>3. Vorobiev A.A. Medical microbiology, virology and immunology - Moscow: " Medical Information Agency ", 2015. - 704 p.  <a href="https://talk.ictvonline.org/">https://talk.ictvonline.org/</a></p> <p>4. <a href="https://viralzone.expasy.org/">https://viralzone.expasy.org/</a></p> <p>5. Principles of Virology. Vol I: Molecular Biology, Vol. II: Pathogenesis and Control (S.J. Flint et al., Third Edition, ASM Press 2015).  <a href="http://www.mcb.uct.ac.za/sites/default/files/image_tool/images/261/Resources/Introduction_to_Molecular_Virology.pdf">http://www.mcb.uct.ac.za/sites/default/files/image_tool/images/261/Resources/Introduction_to_Molecular_Virology.pdf</a></p> <p>6. Acheson, N. H. Fundamentals of molecular virology, 2011, 528p.  <a href="https://doc22843263_445123269?hash=9ed5fac628577bb53f&amp;dl=50a396efb680b4a738pdf">https://doc22843263_445123269?hash=9ed5fac628577bb53f&amp;dl=50a396efb680b4a738pdf</a></p> <p>7. John B. Carter and Venetia A. Saunders. Principles and Applications  <a href="https://doc14170503_392054780?hash=dca9be10c4cf2afae6&amp;dl=8364106a224eae95pdf">https://doc14170503_392054780?hash=dca9be10c4cf2afae6&amp;dl=8364106a224eae95pdf</a></p> <p>8 Borisov, L.B. Medical microbiology, virology, immunology: a textbook for university students / 4th ed., Add. and revised - Moscow: Medical Information Agency, 2005. - 734(in Russian)</p>
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**A Module** BIOL 22002 General biological disciplines module

Module designation	Biophysics
Semester(s) in which the module is taught	5
Person responsible for the module	Bekbolat Zhetpisbayev
Language	Russian, Kazakh
Relation to curriculum	Compulsory Microbiology, Virology, Plant physiology
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Practical Classes - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Physics, chemistry, human anatomy, human physiology
Module objectives/intended learning outcomes	<p>Biophysics is necessary for the formation of scientific methodology and scientific knowledge, the theoretical foundations of clinical, laboratory and functional research methods, molecular diagnostics and the use of modern technical means in biophysical research. After studying the discipline, students should develop the following competencies:</p> <p><b>Knowledge:</b> fundamentals of bioelectrics, respiration, thermodynamics, kinetics, bioelectric potentials of photosynthesis, one of the main processes occurring in organisms that are important for the life of organisms; <b>have skills:</b> on the relationship of physical processes with each other;</p> <p><b>the ability to create:</b> the physical processes that occur in the body.</p>



Content	Elements of information theory.Homeostasis. Concepts of thermodynamics, its 1 law. Thermodynamics 2 the law. Stationary systems. Membrane biophysics. Functions and composition. Membrane models. Permeability of biomembranes and transport of substances. Bioelectric potentials. Methods for studying potentials. Calmness and action potentials. Nernst and Goldman equations. Hodgkin and Huxley the equation. Action potential. Photobiological processes. Laws of light absorption. Optical methods. Spectral instruments. Luminescence. Luminescent analysis. Optical radiation biological effect the effect of ultraviolet light on protein and lipids. Photocancerogenesis Lasers and their types. Application of lasers: in biology and medicine. Physical factors for a living organism influence. Ultrasound Radioactivity. Ionization the effect of Rays on the body.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	1. Antonov V. F. and Dr.: Biophysics.M. GITZ "VLADOS", 1999. 2. Remizov A. N. Medical and Biological Physics.Moscow: Drofa Publ., 2003. 3. Töleubaev Zh.S. Biophysics.Evero,2013 4. Zhatkanbayev Zh..Biological Physics.Almaty, 20118. 5. Urgaliyev zh. Sh. Sarzhanov F. medical biophysics laboratory workshop on the topic:Turkestan, 2012

#### **A Module** BIOL 22002 General biological disciplines module

Module designation	Plant physiology
Semester(s) in which the module is taught	5
Person responsible for the module	Asya Dukenbayeva
Language	Russian, Kazakh
Relation to curriculum	Compulsory Microbiology, Virology, Biophysics
Teaching methods	Lecture (interactive method, communicative method, llab works (works in group, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Seminars - 30 Students Individual Work :105
Credit points	5 ECTS
Requirements according to the examination regulations	Botany, biochemistry.
Module objectives/intended learning outcomes	The purpose of studying the <b>subject</b> : To form students' ideas about the essence of the main physiological processes in plants, their regulation and the laws of the interaction of the plant organism with the environment. Objectives of the <b>disciplines</b> : to give students knowledge about the structural features and functions of plant cells and the physiological foundations of the resistance of the whole organism to the environment.
Content	The content of the discipline covers the whole range of problems as: Plant physiology; The main structural components of a plant cell; Plant cell culture. General characteristics of the nutrient medium. Optimization of culture media; Water exchange between plant cells and plants; Respiratory plants; Mineral nutrition; Plant growth and development; Plant tolerance;
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass



Reading list	<p>1. Bozshataeva G. T. Osimdikter fiziologiyasy : oku kuraly / G. T. Bozshataeva. - Almaty : Evero, 2019. - 259, [1] b</p> <p>2. Dauylbay Amina Duysenkhanzy. Osimdikter physiologiyasy : oku kuraly / Dauylbay Amina Duysenkhanzy, Abildaeva Roza Abdrakhmanovna. - Almaty : Evero, 2016. - 64, [1] b.</p> <p>3. Atabayeva S. Zh. Osimdikter fiziologiyasy : oku kuraly / S. Zh. Atabayeva; Kazakhstan Republikasy Bilim zhane gylm ministerligi. - Almaty: Bastau, 2015. - 266, [1] b.</p> <p>4. Torsykbaeva B.B. Osimdikter anatomiyasy zhane morphologiyasy paninen oku-adistemelik keshen: B.B. Torsykbaeva; Kazakhstan Republikasy Densaulyk aktau ministerligi. - Almaty: Almanac, 2019. - 215, [1] b.</p> <p>5. Kenzheev Zh. Osimdikter fiziologiyasynyn praktikumy. Almaty, 1994.</p> <p>6. Arystanova Sh. E. Osimdik fiziologiyasy. Kokshetau, 2003.</p>
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**A Module** BIOL 33004 Cell Biology, General and Molecular Genetic

Module designation	Molecular biology
Semester(s) in which the module is taught	5
Person responsible for the module	Rakhmetkazhy Bersimbay
Language	Russian, Kazakh
Relation to curriculum	Compulsory
Teaching methods	Lecture (interactive method, communicative method, llab works (works in group, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Laboratory Classes - 30 Students Individual Work :105
BCredit points	5 ECTS
Required and recommended prerequisites for joining the module	cytology, histology, biochemistry
Module objectives/intended learning outcomes	<p>As a result of studying the discipline, the student should <b>know</b>: about the properties of macromolecules that make up living matter, molecular mechanisms of heredity and adaptation of biochemical processes in organisms to changing environmental conditions.</p> <p>The student should <b>be able to</b>: solve situational problems in biochemistry and molecular biology.</p> <p><b>Possess the following skills</b>: to use the acquired knowledge in the study of other biological disciplines, to apply it in the biochemical monitoring of the environment, to assess metabolic disorders in pathological conditions, and to apply the acquired knowledge for setting up and conducting experiments.</p>
Content	Structure and functions of DNA. The Central dogma of molecular biology and the world of RNA. DNA replication in pro-and eukaryotes. The problem of under-replication of the end sections of eukaryotic chromosomes. Transcription of pro-and eukaryotes. Regulation of transcription in pro-and eukaryotes. Eukaryotic transcription factors. RNA processing and splicing in eukaryotes. Translation of prokaryotes. Eukaryotic translation. Folding proteins. Solving problems on protein biosynthesis and genetic code. Solving problems on protein biosynthesis and genetic code. Molecular mechanisms of DNA mutagenesis and repair in prokaryotes. Molecular mechanisms of DNA mutagenesis and repair in eukaryotes. Apoptosis. Patterns of epigenetic inheritance.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass

Reading list	<p>1. Bersimbay R.I. Molecular biology: textbook / - Astana : L.N. Gumilyov , 2015. - 254 (in Kazakh and in Russian)</p> <p>2. Bazhenov I. A. Fundamentals of Molecular Biology. Theory and Practice: textbook / - Saint Petersburg; Moscow; Krasnodar: Lan, 2018. – 139 (in Russian)</p> <p>3. Genes according to Lewin /M.: Publishing house Laboratory of Knowledge. -2017. ISBN 978-5-00101-582-6 (in Russian)</p> <p>4. Lewin's GENES XI Kindle Edition. -2015.- p. 2637</p> <p>5. Kukhar E. V. Practicum on molecular biology; on the implementation of laboratory and practical work for students of biological, molecular biology / E. V. Kukhar. - 2nd Ed., reprint. - Almaty : SSK, 2019. - 117, [1] s (in Russian)</p>
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#### **A Module** BIOL 33007 Applied Biology

Module designation	Bioresources of Kazakhstan
Semester(s) in which the module is taught	5
Person responsible for the module	Abiyev Sardarbek
Language	Russian, Kazakh
Relation to curriculum	Elective discipline Basics of systematics and phylogeny, Methods of investigation of biopolymers, Hormones in phylo-and ontogenesis
Teaching methods	Lectures, Practical Classes
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Practical Classes - 30 Students Individual Work :105
BCredit points	5 ECTS
Required and recommended prerequisites for joining the module	Botany, Vertebrate zoology
Module objectives/intended learning outcomes	Provide students with in-depth knowledge about the bioresources of Kazakhstan, their current state, rational use and protection. The student should <b>know</b> : the diversity and state of the bioresources of the republic, as well as the legal basis for the protection of bioresources. <b>Must be able to</b> : effectively use bioresources. <b>Have skills</b> : use the acquired knowledge in practice.
Content	Types and characteristics of soils of the forest-steppe zone of Kazakhstan and their economic use. Types and characteristics of soils of the steppe zone of Kazakhstan and their economic use. Types and characteristics of the soils of the desert zone of Kazakhstan and their economic use. Types and characteristics of soils of high-altitude mountain belts Kazakhstan and their economic use. Arable land of Kazakhstan, directions of economic use. Chernozem soil types of the forest-steppe zone of Kazakhstan, humus content, directions of economic use. Types and characteristics of the soils of the steppe zone of Kazakhstan and the application of their economic use. Types and characteristics of the soils of the desert zone of Kazakhstan and their economic use. Types and characteristics of soils of high-altitude mountain belts Kazakhstan and their economic use. Arable land (cultivated land) Kazakhstan, directions of economic use. Wild medicinal plants of Kazakhstan, rational use and protection of their natural resources. Wild food plants of Kazakhstan, rational use and protection of their natural resources. Wild-growing tannic and spicy-aromatic plants Kazakhstan, rational use and protection of their natural resources. Cultural (agricultural) plants of Kazakhstan, the area of their cultivation, yields, gross collections. Export and import of Kazakhstan's crop products and wild-growing useful plants.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass

Reading list	<p>1. <i>Bioresources of Kazakhstan: fauna: textbook. Vol. 3: Resources of animals</i> / A. II. Berkinbay, O. K. Shabdarbayeva D. Second. Khusainov, Ma. T. Akoev; Republic of Kazakhstan. - 2nd Ed., supplement-Almaty: Nur-Print, 2015. - 130, [1] s</p> <p>2. <i>Bioresources of Kazakhstan: fauna: textbook. Vol. 2: Bird resources</i> / A. II. Berkinbay, D. C. Shabdarbayeva, G. II. Khusainov, M. T. Akoev ;. - Ed. 2-e, add. - Almaty: Nur-Print, 2015. - 279, [2], c</p> <p>3. <i>Bioresources of Kazakhstan: fauna: textbook. Vol. 1: Fish resources, amphibian resources, reptile resources</i> / A. II. Berkinbay, D. C. Shabdarbayeva, G. II. Khusainov, M. T. Akoev ;. - Ed. 2-e, add. - Almaty: Nur-Print, 2015. - 155, [1], v.</p> <p>4. <i>Kazakhstanika: encyclopedia of the Kazakhstan way. In 6 vols., vol. 2, part 2: Geography of Kazakhstan</i> / under the general editorship of D. N. Nazarbayeva. - Astana: Institute of Eurasian Integration, 2015. – 259 p</p> <p>5. <i>Alybaeva R. A. Protection of terrestrial and aquatic ecosystems: a textbook</i> / R. A. Alybaeva; Ministry of Education and Science of the Republic of Kazakhstan. - Almaty: Bastau, 2014. - 320, [1] c</p>
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**A Module** BIOL 33007 Applied Biology

Module designation	Basics of systematics and phylogeny
Semester(s) in which the module is taught	5
Person responsible for the module	Daniyar Tagayev
Language	Russian
Relation to curriculum	Elective discipline <i>Bioresources of Kazakhstan, Methods of investigation of biopolymers, Hormones in phylo-and ontogenesis</i>
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Practical Classes - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Botany, Invertebrate Zoology, Vertebrate Zoology
Module objectives/intended learning outcomes	<p>As a result of studying the discipline, the student must <b>know</b>: the past and present principles of building a system of the living world As a result of studying the discipline, the student should <b>be able to</b>: understand the basics and problems of the classification of living organisms As a result of studying the discipline, the student must have the <b>skills</b>: of using modern methods of phylogenetic analysis.</p>
Content	The content of the discipline covers a range of issues related to the theory and practice of creating a taxonomic information system, as well as the theory and practice of reconstruction and interpretation of phylogenesis.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	<p>1. Shatalkin A.I. Taxonomy. Foundations, principles and rules. Moscow: KMK Scientific Publishing Association. 2012 (in Russian)</p> <p>2. Pavlinov I.Ya., Lyubarsky G.Yu. Biological taxonomy: the evolution of ideas. 2012 (in Russian)</p> <p>3. V.V. Lukashov Molecular evolution and phylogenetic analysis. Tutorial. - M: BINOM, 2009. -- 256 p. (in Russian)</p> <p>4. Wiley E. O., Lieberman B. S. Phylogenetics: theory and practice of phylogenetic systematics. – John Wiley &amp; Sons, 2011.</p> <p>5. Wägele J. W. Foundations of Phylogenetic systematics. – Munich: Pfeil, 2005.</p>

**A Module** BIOL 33004 Cell Biology, General and Molecular Genetic

Module designation	Methods of investigation of biopolymers
Semester(s) in which the module is taught	5
Person responsible for the module	Ainash Suleimenova
Language	Russian, Kazakh
Relation to curriculum	Elective discipline
Teaching methods	Lecture (interactive method, communicative method, llab works (works in group, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Seminars - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Molecular biology, biochemistry
Module objectives/intended learning outcomes	As a result of studying the discipline, the student must <b>know</b> : physicochemical principles underlying the methods and devices used in molecular biology, and on this basis - understanding the possibilities and limitations of these methods and devices. As a result of studying the discipline, the student should <b>be able to</b> : use independently plan complex experiments for the analysis of biopolymers that are part of complex biological objects. As a result of studying the discipline, the student must have <b>the skills</b> : interpretation of the received results
Content	1. The main types of biopolymers. Their physical and chemical properties 2. Methods for the detection of biopolymers. The use of radioisotopes for the detection of biopolymers 3. Absorption of light by a substance (spectrophotometry). 4. Electrophoresis. Principles of the method Electrophoresis buffers. 5. Electrophoresis in gels. Nucleic acid electrophoresis 6. Protein electrophoresis Special variants of electrophoresis. Elution of biopolymers from gel 7. Centrifugation. Principles of the method. General arrangement of the centrifuge. 8 Variants of the practical use of sedimentation. 9. Chromat 14. Mass spectrometry as a method for the analysis of biopolymer molecules. 10. Quantitative aspects of PCR "Semi-quantitative" PCR (detection on the non-exponential part of the product accumulation curve). Real-Time PCR (detection on the exponential portion of the product accumulation curve). 11. Digital PCR in isolated macroscopic volumes 12. Method of molecular colonies - PCR in Digital PCR gel in inverted water-oil emulsion using the example of BioRad QX100. 13. Mass Parallel Sequencing Systems (MPSS). Methods of clonal amplification and determination of nuclei used in MPSS. amplification sequences. Principles of the method. Classification and examples of chromatographic methods. Column, paper chromatography 14. Gel filtration. Ion exchange chromatography.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass



Reading list	<p>1. Proskurina Irina Konstantinovna. <i>Biochemistry: a textbook for university students</i>, . - 2nd ed., Erased. - Moscow: Academy, 2014. - 333, <a href="https://search.rsl.ru/ru/record/01005501123">https://search.rsl.ru/ru/record/01005501123</a></p> <p>2. Seitov, ZS <i>Biochemistry: textbook</i>. /.- 4th ball. and processing. ed.- Almaty: Akbar, 2011.- 795, [1] p. ISBN 978-601-278-298-1. <a href="https://www.twirpx.com/file/3066655/">https://www.twirpx.com/file/3066655/</a></p> <p>3. <i>Principles and Methods of Biochemistry and Molecular Biology</i>, Aitken, E.; Beidone, A.R.; Fiff, J.; Wilson, K., 2012. <a href="https://rucont.ru/efd/443513">https://rucont.ru/efd/443513</a></p> <p>4. <i>Molecular biology</i>, Konichev, Alexander Sergeevich; Sevastyanova, Galina Andreevna, 2015. <a href="https://rucont.ru/efd/443513">https://rucont.ru/efd/443513</a></p>
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#### **A Module** BIOL 22002 General biological disciplines module

Module designation	<i>Hormones in phylo-and ontogenesis</i>
Semester(s) in which the module is taught	5
Person responsible for the module	Tamara Ukbaeva
Language	Russian, Kazakh
Relation to curriculum	Elective discipline
Teaching methods	Lecture (interactive method, communicative method, llab works (works in group, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures - 15, Seminars - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Molecular biology, human physiology, evolutionary theory
Module objectives/intended learning outcomes	<p>The main goal of the discipline is to acquire students ' knowledge about the molecular mechanisms of signal transduction of hormones, neurotransmitters and tissue factors, the emergence and formation of these mechanisms during evolution, as well as their significance in the individual development of the body.</p> <p>As a result of mastering the discipline, the student <b>must</b>:</p> <p>Have an idea of the formation of signal transduction mechanisms in phylogeny and their significance for the individual development of the organism. Know the basics of molecular physiology of signaling molecules and their receptors; molecular-genetic and evolutionary-ontogenetic organization of the humoral regulatory system. Be able to apply information about the molecular-genetic and evolutionary-ontogenetic organization of the humoral signal system to analyze the regulatory effects of hormones, neurotransmitters and tissue factors.</p>
Content	<p>The significance of signal transduction systems for living organisms. Bacterial signal transduction systems. Increasing the role of signal transduction genes in the course of evolution. Increasing the role of signal transduction genes in the course of evolution. The main types of signal molecule receptors. G - protein coupled receptors (GPCRs). The main types of signal molecule receptors. Receptors with enzymatic activity. Ligand -Gated Ion Channels (LGICs). The main types of signal molecule receptors. Ligand-activated transcription factors (nuclear receptors-NR). Regularities of the evolution of the endocrine system. Formation of the endocrine glands. Formation of multilevel neuroendocrine systems. Continuation of the evolution of endocrine regulation in modern organisms. A new primate hormone. Signaling molecules, their effects, and receptors in ontogenesis. functions of humoral factors in vertebrate ontogenesis. Signaling molecules, their effects, and receptors in ontogenesis. Morphogenetic, programming the subsequent properties and functions of the adult body, the effect of hormones in early ontogenesis. Critical periods of development.</p>
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)

Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	<p>1. Dygalo N. N. Receptors of hormones, neurotransmitters and tissue factors. Textbook for the course "Hormones in phylogeny and ontogenesis", NSU Publishing House.- Novosibirsk. – 2009 118 c.</p> <p>2. Dygalo N. N. Receptors of hormones, neurotransmitters and tissue factors. Textbook for the course "Hormones in phylogeny and ontogenesis", NSU Publishing House.- Novosibirsk. - 2001 36 c.</p> <p>3. Dygalo N. N. Subtypes of receptors, their specific functions and Significance for the clinic (using the example of alpha2-adrenergic receptors). Textbook for the course "Hormones in phylogeny and ontogenesis", 2003  <a href="http://www.bionet.nsc.ru/HormEvDev/posobie1.html">http://www.bionet.nsc.ru/HormEvDev/posobie1.html</a></p> <p>4. Dygalo N. N. Genetic and hormonal regulation of male phenotype ontogenesis and mechanisms of formation of sexual orientation disorders. Textbook for the course "Hormones in phylogeny and ontogenesis", 2003  <a href="http://www.bionet.nsc.ru/HormEvDev/posobie2.html">http://www.bionet.nsc.ru/HormEvDev/posobie2.html</a></p> <p>5. Dygalo N. N. Acquisition of hormonal functions by steroids in evolution and their effects in early ontogenesis. Advances in Modern Biology, 1993, vol. 113, issue 2, pp. 162-175.</p>

**A Module Bioinformatics and mathematical data processing in biology**

Module designation	Biometrics
Semester(s) in which the module is taught	6
Person responsible for the module	Nurmukhambetova Gaziza
Language	Russian, Kazakh
Relation to curriculum	Profile / University
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures- 15, Seminars - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Mathematics, Genetics
Module objectives/intended learning outcomes	<p>Know:</p> <p>Numerical characteristics, descriptions of a set of empirical data; distribution laws, variance and regression analysis, the criterion for the reliability of estimates;</p> <p>be able to:</p> <ul style="list-style-type: none"> <li>- determine by biometric method the average values of the studied trait;</li> </ul> <p>acquire practical skills:</p> <ul style="list-style-type: none"> <li>- determination of the most important biometric indicators;</li> <li>- positional and mathematical presentation of the results of biometric studies;</li> <li>- the use of biometric methods in the processing of their scientific research.</li> </ul>
Content	The content of the discipline covers the entire range of issues, related to the classification, processing and analysis of experimental data in the field of biology, medicine and agriculture by methods of mathematical statistics. Onovnye representations, probability theories. Discrete random variables. Non-trivial random variables.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)



Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	<ol style="list-style-type: none"> <li>1. Aubakirov H. A. Biometrics. – Almaty: Epoch, 2011 – - 408 P. (in Kazakh)</li> <li>2. Ramankulova A. A. Biological statistics. – Almaty, 2014. - 210 P. (in Kazakh)</li> <li>3. Shulembayeva K. K. Biological statistics. – Almaty, 2013 - 97 p. (in Kazakh)</li> <li>4. Koychubekov B. K., Bukeyeva A. S. Biology fundamentals of Statistics. – Karaganda, 2010. (in Kazakh)</li> <li>5. Tolegenov S. Biometrics. – Almaty, 2016. - 372 P. (in Kazakh)</li> </ol>

**A Module** Cell Biology, General and Molecular Genetic

Module designation	Genetics
Semester(s) in which the module is taught	6
Person responsible for the module	Olga Bulgakova
Language	Russian, Kazakh
Relation to curriculum	Profile / University
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures- 15, Seminars - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Cell biology; Biochemistry
Module objectives/intended learning outcomes	<p>As a result of studying the discipline, the student must know: Understand the basic processes of gene transmission, mutation, expression, and regulation; Fundamental laws of inheritance and patterns of variability; material about the gene, which is the structural the functional unit of heredity; genetic basis of selection; history formation of genetics and its place in the system of natural sciences.</p> <p>As a result of studying the discipline, the student should be able to: solve genetic problems; find a logical connection between the main sections of the course; draw up crossings, pedigree, gene locations, and genetic drawings.</p> <p>As a result of studying the discipline, the student must have the skills: hybridization of plant objects and crossbreeding of animals by the example of the <i>Drosophila</i></p>

<i>Content</i>	<i>The content of the discipline covers the whole range of problems related tot he phenomenon of heredity and variability. A number of points related to organization of the course should be noted: Mendelism and Cyromosomal Theory; Transmission of Genetics: The Principle of Segregation; Chromosomes and Sex Inheritance; Genetic Lincage and Cromosome Mapping; Molecular Biology of DANN Replication and Recombination; Molecular Organization of Chromosomes; Human Caryotypes and Chromosome Behavior; Genetics of Bacteria and Their Viruses; Molecular Biology of Gene Expression; Molecular Mechanisms of Gene Regulation;Non-Mendelian Inheritance; Quantitive and Evolutionary Genetics; Population Genetics;The Genetic Basis of Complex Traits</i>
<i>Exams and assessment formats</i>	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
<i>Study and examination requirements</i>	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
<i>Reading list</i>	<i>1.Zhimilov I.F.General and Molecular Genetics, Novosibirsk,2003 Textbook (in Russian) 2.Inge-Vechtomov S.G. Genetics with Fundamentals of selection,2010,Sankt-Peteersburg. Textbook (in Russian) 3. Bersimbay R.I.Genetics.Astana,2015 Textbook (in Kazakh) 4.Bersimbay R.I.Genetics,Almaty,2017 Textbook (in Kazakh) 5.Tamarin in R.H. Principles of Genetics,Drown Publishers,Fifth Edition, 1996</i>

**A Module** *General biological disciplines module*

<i>Module designation</i>	<i>Evolutionary Science</i>
<i>Semester(s) in which the module is taught</i>	<i>6</i>
<i>Person responsible for the module</i>	<i>Daniyar Tagayev</i>
<i>Language</i>	<i>Russian, Kazakh</i>
<i>Relation to curriculum</i>	<i>Profile / University</i>
<i>Teaching methods</i>	<i>Lecture (interactive method, communicative method, seminar (case study, communicative method)</i>
<i>Workload (incl. contact hours, self-study hours)</i>	<i>Total workload: 150 Contact hours: Lectures- 15, Seminars - 30 Students Individual Work :105</i>
<i>Credit points</i>	<i>5 ECTS</i>
<i>Required and recommended prerequisites for joining the module</i>	<i>Cell biology; Biochemistry</i>
<i>Module objectives/intended learning outcomes</i>	<i>As a result of studying the discipline, the student must know: the main provisions of the evolutionary theory and the mechanisms of evolution of the organic world. As a result of studying the discipline, the student should be able to: to use knowledge about the ways and mechanisms of evolution of the organic world in professional activity. As a result of studying the discipline, the student must have the skills: of analysing of evolutionary processes in connection with modern achievements of natural sciences.</i>

<i>Content</i>	<i>Main provisions of the evolutionary theory. Microevolution. Macroevolution. Natural selection. Adaptation. Sexual selection. Speciation. Evolution of ontogeny, organs and functions. Biological progress. Transfer of genetic material, gene, chromosome and genome mutations; relationship between genotype and phenotype, mutations induced by radiation, the combined effects of radiation and other environmental factors.</i>
<i>Exams and assessment formats</i>	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
<i>Study and examination requirements</i>	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
<i>Reading list</i>	<i>1. Iordansky, N.N. Evolution of life: a textbook for academic bachelor's degree / N.N. Iordansky.- M.: Yurayt Publishing House, 2018 (in Russian)</i> <i>2. Douglas J. Futuyma. Evolution. 2nd ed. Sinauer Associates, Sunderland, Massachusetts, 2009</i> <i>3. Yablokov A.V., Yusufov A.G. Evolutionary science, Moscow, 2006 (in Russian)</i>

#### **A Module** *Methodical aspects of biology teaching*

<i>Module designation</i>	<i>Methods of teaching biology</i>
<i>Semester(s) in which the module is taught</i>	<i>6</i>
<i>Person responsible for the module</i>	<i>Aigul Dinmukhamedova</i>
<i>Language</i>	<i>Russian, Kazakh</i>
<i>Relation to curriculum</i>	<i>Profile / University</i>
<i>Teaching methods</i>	<i>Lecture (interactive method, communicative method, seminar (case study, communicative method)</i>
<i>Workload (incl. contact hours, self-study hours)</i>	<i>Total workload: 150</i> <i>Contact hours: Lectures- 15, Seminars - 30</i> <i>Students Individual Work :105</i>
<i>Credit points</i>	<i>5 ECTS</i>
<i>Required and recommended prerequisites for joining the module</i>	<i>Cytology and Histology; Biochemistry, Botany, Zoology, Genetics, Human Anatomy, Human and Animal physiology, Plant physiology</i>
<i>Module objectives/intended learning outcomes</i>	<i>Formation of a system of knowledge about the methods, techniques and technologies of teaching biology in secondary schools. As a result of studying the module, the student should have an idea of the methodology of teaching biology as a science and the system of practical activities implemented in the professional activity of a biology teacher, about the features of the methodological systems of teaching biology at school; know the main provisions of the traditional methodology of teaching biology at school, the specifics, the basic principles of designing the content of education, as well as the methodology of teaching students; be able to conduct a logical-biological, methodological and didactic analysis of the content of education; possess the skills of drawing up long-term and thematic plans, developing various types of lessons.</i>

<i>Content</i>	<i>Subject and problems of methods of teaching biology, its scientific base. The main stages in the development of methods of teaching biology. The role of biological education in modern society. The content and goals of biological education. Education in the process of teaching biology. Vocational training of teachers in modern conditions. Pedagogical technologies of teaching in biology. Biology forms of education. Biology teaching methods. The material base of teaching biology. The use of new information technologies in preparation for a biology lesson.</i>
<i>Exams and assessment formats</i>	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
<i>Study and examination requirements</i>	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
<i>Reading list</i>	<i>1. Izbassarova R.Sh. Methodology of teaching biology, Almaty. - 2016.-- 378 p.</i> <i>2. Ishmukhamedova N.B.Methods of teaching general biology: a textbook for university students; Abai Kazakh National Pedagogical University. - Almaty: Luxe Media Group, 2010. – 181(in Kazakh)</i> <i>3. Tormanov N.Innovative methods of teaching biology: textbook / N. Tormanov, NT Абылайханова; Al-Farabi Kazakh National University. - Almaty, 2013. – 259 p. (in Kazakh)</i> <i>4. Tasimova A.A.Modern educational technologies: textbook / A.A. Tasimova. - Almaty: Evero, 2019.—216p. (in Russian)</i> <i>5. Yakunchev M.A. Methods of teaching biology, Moscow, 2014, 332. (in Russian)</i>

#### **A Module** *Applied biology*

<i>Module designation</i>	<i>Parasitology</i>
<i>Semester(s) in which the module is taught</i>	<i>6</i>
<i>Person responsible for the module</i>	<i>Zhibek Sembayeva</i>
<i>Language</i>	<i>Russian, Kazakh</i>
<i>Relation to curriculum</i>	<i>Basic / Elective</i>
<i>Teaching methods</i>	<i>Lecture (interactive method, communicative method, seminar (case study, communicative method)</i>
<i>Workload (incl. contact hours, self-study hours)</i>	<i>Total workload: 210</i> <i>Contact hours: Lectures- 30, Seminars - 45</i> <i>Students Individual Work :135</i>
<i>Credit points</i>	<i>7 ECTS</i>
<i>Required and recommended prerequisites for joining the module</i>	<i>Invertebrate Zoology; Vertebrate Zoology</i>
<i>Module objectives/intended learning outcomes</i>	<i>As a result of studying the discipline, the student must know: know the ways of human infection with various protozoa, diagnosis and prevention of protozoal diseases;</i> <i>As a result of studying the discipline, the student should be able to: correctly explain the methods of diagnosis and prevention of protozoal diseases;</i> <i>As a result of studying the discipline, the student must have the skills: to form an idea of parasites as permanent components of ecosystems, the patterns of their evolution and dispersal.</i>
<i>Content</i>	<i>Parasitism as a form of existence of living organisms. Adaptation to a parasitic lifestyle. Life cycles of parasitic organisms. The host organism as a parasite's habitat. The relationship between the parasite and the host. Population ecology of parasites.</i>

<i>Exams and assessment formats</i>	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
<i>Study and examination requirements</i>	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
<i>Reading list</i>	1. E.E. Kornakova - Medical parasitology. / HER. Kornakov. - M.: Academy, 2010. 2. Pavlovich S.A., Andreev V.P. - Medical parasitology with entomology. Minsk "Higher School", 2012. 3. Myandina G.I., Tarasenko E.V. - Medical parasitology, Textbook M.: 2013. 4. Yafaev R.Kh. Medical parasitology: a textbook. / R.Kh. Yafaev. - SPb.: Foliant, 2007.

**A Module** Cell Biology, General and Molecular Genetic

<i>Module designation</i>	<i>Fundamentals of molecular medicine</i>
<i>Semester(s) in which the module is taught</i>	<i>6</i>
<i>Person responsible for the module</i>	<i>Tamara Ukbaeva</i>
<i>Language</i>	<i>Russian, Kazakh</i>
<i>Relation to curriculum</i>	<i>Basic / Elective</i>
<i>Teaching methods</i>	<i>Lecture (interactive method, communicative method, seminar (case study, communicative method)</i>
<i>Workload (incl. contact hours, self-study hours)</i>	Total workload: 210 Contact hours: Lectures- 30, Seminars - 45 Students Individual Work :135
<i>Credit points</i>	<i>7 ECTS</i>
<i>Required and recommended prerequisites for joining the module</i>	<i>Molecular biology, genetics</i>
<i>Module objectives/intended learning outcomes</i>	<i>The purpose of the discipline is to teach students the modern basics of gene function, explain the mechanisms of their expression; familiarization with the principles of heredity of multifactorial diseases, training in the diagnosis of hereditary types, familiarization with genealogical analysis. As a result of studying the discipline, students should be able to: identify the main molecular mechanisms of etiology and pathology (diseases transmitted by heredity, etc.); master: determine the genetic predisposition to certain somatic and oncological diseases before the onset of the disease; it is necessary to be able to: perform individual preventive corigation therapy and a prevention program</i>
<i>Content</i>	<i>DNA diagnostics using hybrid probes. Mass spectrometry. Prenatal diagnosis of genetic diseases. Genetic, chromosomal, and multifactorial diseases. Chromosomal diseases, diagnostics. Hereditary gene diseases of the autosomal dominant type. Hereditary gene diseases of the autosomal-recessive type. Pharmacogenetics. Gene therapy.</i>
<i>Exams and assessment formats</i>	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>

<i>Study and examination requirements</i>	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
<i>Reading list</i>	<p>1. <i>Clinical genetics: textbook/ N. P. Bochkov, V. P. Puzyrev, S. A. Smirnikhina: ed. by N. P. Bochkov-4th ed., additional and pererab. - M.: GEOTARMedia. 2013. -592 s</i></p> <p>2. <i>V. G. Kukesa, N. P. Bochkova. Clinical pharmacogenetics / - M.: GEOTAR-Media, 2007. - 248 p. 1</i></p> <p>3. <i>Kurchanov N. A. Human genetics with the basics of general genetics: a textbook. - M: Publishing house: SpetsLit, 2009 -192 p.</i></p> <p>4. <i>V. I. Gorbunova Introduction to molecular medicine-St. Petersburg, 2007. 34 p.</i></p> <p>5. <i>Clinical biochemistry / ed. by V. A. Tkachuk. - M.: GEOTAR-Media, 2008. - 264 p.</i></p>

**A Module** *General biological disciplines module*

<i>Module designation</i>	<i>Neurophysiology</i>
<i>Semester(s) in which the module is taught</i>	<i>6</i>
<i>Person responsible for the module</i>	<i>Zhanat Mukataeva</i>
<i>Language</i>	<i>Russian, Kazakh</i>
<i>Relation to curriculum</i>	<i>Basic / Elective</i>
<i>Teaching methods</i>	<i>Lecture (interactive method, communicative method, seminar (case study, communicative method)</i>
<i>Workload (incl. contact hours, self-study hours)</i>	<p><i>Total workload: 210</i></p> <p><i>Contact hours: Lectures- 30, Seminars - 45</i></p> <p><i>Students Individual Work :135</i></p>
<i>Credit points</i>	<i>7 ECTS</i>
<i>Required and recommended prerequisites for joining the module</i>	<i>anatomy, histology, cytology, biochemistry, genetics, cell biology, biophysics, human and animal physiology.</i>
<i>Module objectives/intended learning outcomes</i>	<p><i>As a result of studying the discipline, the student must know: the basics of the physiology of the nervous tissue and the central nervous system of a person, the functional organization of the nervous system, the principles of the system organization of brain functions, the physiological mechanisms of receiving and processing information by a living organism.</i></p> <p><i>As a result of studying the discipline, the student should be able to: interpret the results of the most common methods used to assess the functional state of the central nervous system and higher mental functions, make calculations based on the results of the experiment, conduct statistical processing of experimental data.</i></p> <p><i>As a result of studying the discipline, the student must have practical skills to be able to perform the methods used to assess the functional state of the central nervous system (functional asymmetry of the brain, determining the characteristics of attention and the volume of short-term memory).</i></p>



<i>Content</i>	<ul style="list-style-type: none"> <li>- provide students with fundamental knowledge in all areas of neurophysiology;</li> <li>- provide an understanding of the general patterns and specific features of neurophysiology;</li> <li>- to acquaint with new achievements of neurophysiological science and prospects of its development;</li> <li>- to form students' physiological thinking.</li> </ul>
<i>Exams and assessment formats</i>	two oral rating (20 minutes each) and one final oral exam (40 minutes)
<i>Study and examination requirements</i>	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
<i>Reading list</i>	1. "Human and Animal Physiology":  Apchel V. Ya., Darinsky Yu. A., Golubev V. N. et al., Moscow: Akademiya, 2013, 441p.( Russian) 2. "Human and animal physiology": / U. K. Akhanov. Almaty: Epigraph, 2016. - 235p.( Russian) 3. "Physiology of humans and animals": / Zh. K. Nurbekova, D. S. Naimanova, N. S. Shapekova, etc.; MES RK, ENU named after L. N. Gumilyov.- Electron. sounds.dan. (3 files : 98 MB).- Astana: L. N. Gumilyov ENU, 2013. - 1 electron. disk : in a container, 13x19 cm.( Russian) 4. "Human and animal physiology": / U. K. Akhanov. Almaty: Epigraph, 2016. - 178p.( Russian) 5. "Age-related anatomy and physiology". / Z. V. Lyubimova, A. A. Nikitina ; MSPU. - 2nd ed., reprint. and add. - M.: Yurayt, 2014. - 447p.( Russian)

**A Module** General biological disciplines module

<i>Module designation</i>	<i>Animal and human behaviour</i>
<i>Semester(s) in which the module is taught</i>	6
<i>Person responsible for the module</i>	Zhibek Sembayeva
<i>Language</i>	Russian, Kazakh
<i>Relation to curriculum</i>	Basic / Elective
<i>Teaching methods</i>	Lecture (interactive method, communicative method, seminar (case study, communicative method)
<i>Workload (incl. contact hours, self-study hours)</i>	Total workload: 210 Contact hours: Lectures- 30, Seminars - 45 Students Individual Work :135
<i>Credit points</i>	7 ECTS
<i>Required and recommended prerequisites for joining the module</i>	Invertebrate Zoology; Vertebrate Zoology
<i>Module objectives/intended learning outcomes</i>	<p>As a result of studying the discipline, the student must know: analysis of animal and human behavior; analysis of natural and social factors in human life; be able to distinguish between general patterns of development of mental functions in the process of phylogeny and ontogenesis</p> <p>As a result of studying the discipline, the student should be able to: consider the development of the psyche from the point of view of the theory of evolution.</p> <p>As a result of studying the discipline, the student must have the skills: analysis of works and writing reports and abstracts based on their results.</p>
<i>Content</i>	Subject and methods of genetics behavior. Genetics behavior Invertebrates animals. Genetics behavior vertebrates. Genetic analysis of behavior in person.

Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)
Study and examination requirements	The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass
Reading list	1. Ilesheva R. Medical psychology / Komekshi onu Araly.- Almaty: Sanat, 1994. - 88 p. 2. Zharykbayev A. Psychology: Ped. shkolnik arn. - Ond. tolík. 2-shi basylui. - Almaty: Mektep, 1982. - 280 p. 3. Vanegr V. A. Psychology of animals. - 2nd edition. - M., 1982

**A Module** General biological disciplines module

Module designation	Teaching Practice
Semester(s) in which the module is taught	6
Person responsible for the module	Nurmukhambetova Gaziza
Language	Russian, Kazakh
Relation to curriculum	Profile/ University
Teaching methods	seminar
Workload (incl. contact hours, self-study hours)	90
Credit points	3 ECTS
Required and recommended prerequisites for joining the module	Methods of teaching biology, Introduction to Biology
Module objectives/intended learning outcomes	To know: - the system of educational work of the school; - structure and content of teaching biology in schools; Be able to: - conduct biology lessons using a variety of technologies, teaching methods; conduct extracurricular and extracurricular activities Possess: -skills of using the equipment of the biology classroom -skills of professional communication in educational situations
Content	Acquisition of practical skills necessary for the work of a biology teacher, including the skills of educational work with children
Exams and assessment formats	defense of practice report
Study and examination requirements	The student must complete the assigned tasks within a strictly defined time frame. Being late for practice is not welcome. A student who misses an internship or fails to complete a task is not allowed to submit a report on the internship. Attendance is mandatory; absence can only be for a valid reason. All omissions are worked out in the form of individual tasks, preparation of presentations, etc. Exam form: presentation of the practice report. Student report (general report, diaries, practice documents, presentations)

Reading list	<p>1. Ponomareva I. N. General methodology of teaching biology: textbook. manual for students of pedagogical universities / Ponomareva Irina Nikolaevna, Solomin V. P., Sidelnikova G. D.; ed. Ponomareva I. N.-M.: Akademiya, 2013. - 272 p. (in Russian)</p> <p>2. "I Don't Know," I Said. Biology course new approaches to learning. - Almaty – 2008-263b. (in Kazakh)</p> <p>3. Ishmukhamedova.B. general biology teaching methods: higher education for students of educational institutions textbook-Almaty: 2010. - 184 P. (in Kazakh)</p> <p>4. Kemelkyzy, T. biology training methodology: educational and methodical complex / "I Don't Know," She Said. Ongarbayeva Ramazanovna; – Kyzylorda: Pearl-Marzhan, 2010. – 83 (in Kazakh)</p> <p>5. Solovyova. A. R, Ibraimova.B, Biology 8th grade Almaty, Atamura, 2018 (in Kazakh)</p>
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#### A **Module** BIOL 52002 Molecular and Cell Biology

Module designation	Cell Biology
Semester(s) in which the module is taught	7
Person responsible for the module	Zhannat Bazarbayeva
Language	Russian, Kazakh
Relation to curriculum	Compulsory / elective
Teaching methods	Lecture (interactive method, communicative method, lab works (works in group, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures- 15, Seminars - 30 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	Introduction to Biology, Botany, Human Anatomy
Module objectives/intended learning outcomes	<p>As a result of studying the discipline, the student must know: history of cytology; light, electron microscopy, digital cytochemical, autoradiographic, methods; structure and function of cells; basic principles of cell theory; structure and function of the cell nucleus, cell organelle as an important part of the cell; mechanisms of cell division; cell death the student should be able work with the main types of light microscopes; microscopy of cytological and histological preparations, cell culture; differentiation of different types of cells and tissues; find and describe the basic elements of cells and tissues under microscopy; describe and analyze the structural elements of cells and tissues in micrographs and electronograms; systematization and generalization of the obtained data by statistical methods; search for scientific information in the field of Cell Biology through the analysis of domestic and foreign literature.</p> <p>As a result of studying the discipline, the student must have the skills: conducting experimental research at the tissue, cellular and subcellular levels; apply and analyze the knowledge gained in the study of cells in normal and pathological conditions.</p>
Content	Know the basic laws and modern achievements of Cell Biology, demonstrates knowledge in the field of modern methods for the study of cells. Understands modern problems of biology and uses fundamental biological concepts to solve research problems.
Exams and assessment formats	two oral rating (20 minutes each) and one final oral exam (40 minutes)

Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	<p>1. Myrzagalieva, AB <i>Cytology: textbook</i> / A.B. Myrzagaliyeva; Ministry of Education and Science of the Republic of Kazakhstan. - Almaty: Daur, 2013. – 214 (in Kazakh)</p> <p>2..Bazarbaeva Zh.M. <i>Cytology and histology. textbook</i> Almaty, 2011, 208. (in Kazakh)</p> <p>3 K.A.. Saparov, Zh.M. Bazarbayeva, B.A. Abdullaeva. <i>Glossary of terms cytology, histology, embryology.</i> Almaty, 2012, 454p. (in Kazakh)</p> <p>4. Nurtazin ST <i>General histology. textbook</i> Almaty, 2010 (in Kazakh)</p> <p>5. Chentsov Y.S <i>Introduction to cellular biology. Textbook.</i> Moscow, 2015, 495p. (in Russian)</p> <p>6. Myadelets OD <i>Human histology, cytology and embryology. Part 1.Cytology, embryology and general histology: textbook.</i> - Vitebsk: VSMU, 2014 - 439 p. (in Russian)</p>

Module designation	<i>Immunology</i>
Semester(s) in which the module is taught	<i>7</i>
Person responsible for the module	<i>Almira Akparova</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	<i>Lecture (interactive method, communicative method, seminar (case study, communicative method)</i>
Workload (incl. contact hours, self-study hours)	<p><i>Total workload: 150</i></p> <p><i>Contact hours: Lectures- 15, Seminars - 30</i></p> <p><i>Students Individual Work :105</i></p>
Credit points	<i>5 ECTS</i>
Required and recommended prerequisites for joining the module	<i>cytology, biochemistry, anatomy and physiology of humans and animals</i>
Module objectives/intended learning outcomes	<p><i>To present students with modern ideas about the structure and functioning of the immune system in normal and immunopathological conditions; study of the role of the immune system in maintaining the genetic constancy of the internal environment of the body, the mechanisms of immunological recognition and regulation of individual parts of the immunological response at the molecular and cellular levels; to promote the development of scientific thinking among students, to introduce them to work with special literature. Students should know: the structure of antigens, their main types and characteristics; the structure and functions of the humoral immunity system, individual classes of immunoglobulins; genetic control of the synthesis of immunoglobulins; the structure and functions of the cellular immunity system; the main subpopulations of T - lymphocytes and their functions; the concept of natural and induced immunological tolerance. They should be able to: classify the main characteristics of cytokines, their functions. Have skills: on the structure of the main histocompatibility complex, the function of its loci; identify the role of HLA antigens as genetic markers of hereditary predisposition to diseases.</i></p>

Content	<i>Organs and cells of the immune system. Basic properties and structure of antigens. The main complex of histocompatibility and HLA. The structure of immunoglobulins. Primary and secondary immune responses. The system of humoral immunity. The system of cellular immunity. The system of mononuclear phagocytes. The system of mononuclear phagocytes. Antitumor immunity. Primary and secondary immunodeficiency states. The main types of vaccines. Modern research methods in immunology.</i>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	<p>1. Gabriel Virella. <i>Medical Immunology (Seventh Edition)</i> // Taylor &amp; Francis Group. – 2020. - 474 p. ISBN: 9781000537130, 1000537137 (in English)</p> <p>2. Tengchuan Jin, Qian Yin. <i>Structural Immunology</i> // Springer Singapore. – 2019. – 234 p. ISBN 978-981-13-9367-9 (in English)</p> <p>3. Gavin Spickett. <i>Oxford Handbook of Clinical Immunology and Allergy</i> // Oxford University Press. – 2019. – 705 p. ISBN: 0198789521, 9780198789529 (in English)</p> <p>4. Ukbaeva T.D., Babaeva K.S. <i>B-immune system. Differentiation of B-lymphocytes, immunoglobulins. Teaching aid NMS ENU Astana, ENU named after L.N. Gumilyov 2017, 92 p. (in Russian)</i>  <a href="http://www.ncbi.nlm.nih.gov/pubmed">http://www.ncbi.nlm.nih.gov/pubmed</a></p>

Module designation	<i>Immunology and Allergology</i>
Semester(s) in which the module is taught	<i>7</i>
Person responsible for the module	<i>Almira Akparova</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	<i>Lecture (interactive method, communicative method, seminar (case study, communicative method)</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload: 150</i> <i>Contact hours: Lectures- 15, Seminars - 30</i> <i>Students Individual Work :105</i>
Credit points	<i>5 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Cytology and Histology; Biochemistry; Human Anatomy</i>
Module objectives/intended learning outcomes	<p><i>As a result of studying the discipline, the student must know:</i>  <i>The principles of the organization and functioning of the immune system, the mechanisms of immunological recognition and regulation of the immunological response at the molecular and cellular levels, causes of allergy, types of allergic reactions, mechanisms underlying the clinical signs of allergy.</i></p> <p><i>As a result of studying the discipline, the student should be able to: use knowledge to solve scientific problems; find links between immunology and other biological sciences (cellular and molecular biology, physiology, biochemistry, genetics).</i></p> <p><i>As a result of studying the discipline, the student must have the skills: be able to perform sample preparation of biological material for immunological research; to apply commonly used immunological techniques; correctly interpret the results.</i></p>

Content	<i>Organs and cells of the immune system. Basic properties and Organization and functioning of the immune system, structure of antigens and antibodies, mechanisms of the immune response, molecular and cellular mechanisms of immune reactions, causes of allergic reactions, mechanisms of development and manifestation of allergies, methods of allergy diagnostics.</i>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	<p>1. Gabriel Virella. <i>Medical Immunology (Seventh Edition)</i> // Taylor &amp; Francis Group. – 2020. - 474 p. ISBN: 9781000537130, 1000537137 (in English)</p> <p>2. Tengchuan Jin, Qian Yin. <i>Structural Immunology</i> // Springer Singapore. – 2019. – 234 p. ISBN 978-981-13-9367-9 (in English)</p> <p>3. Gavin Spickett. <i>Oxford Handbook of Clinical Immunology and Allergy</i> // Oxford University Press. – 2019. – 705 p. ISBN: 0198789521, 9780198789529 (in English)</p> <p>4. Ukbaeva T.D., Babaeva K.S. <i>B-immune system. Differentiation of B-lymphocytes, immunoglobulins. Teaching aid NMS ENU Astana, ENU named after L.N. Gumilyov 2017, 92 p. (in Russian)</i>  <a href="http://www.ncbi.nlm.nih.gov/pubmed">http://www.ncbi.nlm.nih.gov/pubmed</a></p>

Module designation	<i>Gene engineering</i>
Semester(s) in which the module is taught	<i>7</i>
Person responsible for the module	<i>Asya Dukenbayeva</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	<i>Lecture (interactive method, communicative method, seminar (case study, communicative method)</i>
Workload (incl. contact hours, self-study hours)	<p><i>Total workload: 150</i></p> <p><i>Contact hours: Lectures- 15, Seminars - 30</i></p> <p><i>Students Individual Work :105</i></p>
Credit points	<i>5 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Molecular Biology, Genetics, Cytology and Histology</i>
Module objectives/intended learning outcomes	<p><i>The objectives of the study of the discipline are to form theoretical and practical knowledge about genetic engineering aimed at creating new forms of biologically active DNA and genetically new forms of cells and whole organisms using artificial methods of gene transfer, including technologies of recombinant DNA, genetic transformation, cell hybridization, etc.</i></p> <p><i>The objectives of the discipline include the study of the molecular foundations of genetic engineering, methods of recombinant DNA technology, construction of restriction maps and methods for determining nucleotide sequences, construction of recombinant DNA and their cloning, methods of introducing a gene into a cell, genetic manipulation of mammalian and plant cells.</i></p>



Content	<i>The content of the discipline covers the whole range of problems as: Introduction to Genetic Engineering; Genetic engineering enzymes; Restriction enzymes; Construction of vector molecules; DNA sequencing methods; Introduction of a new gene into a cell; Genetic manipulation of bacterial cells; Directed mutagenesis of a DNA molecule in vitro; Protein Engineering; Introduction of genes into mammalian cells; Genetic engineering of plants; Based on the animal virus system; Gene therapy; Antiviral vaccines; Vaccines against human immunodeficiency virus;</i>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	<ol style="list-style-type: none"> <li>1. Shchelkunov S. N. Genetic engineering / / Novosibirsk: Siberian University Publishing House, 2017. 367s. <a href="https://www.twirpx.com/file/1942652/">https://www.twirpx.com/file/1942652/</a></li> <li>2. Kurnaz I. A. Techniques in Genetic Engineering // CRC Press Taylor &amp; Francis Group, Boca Raton London New York, 2015. –334 pp. <a href="https://www.taylorfrancis.com/books/9780429076343">https://www.taylorfrancis.com/books/9780429076343</a></li> <li>3. Kormann M. S. D. Modern Tools for Genetic Engineering // Published by ExLi4EvA, 2016. –220 pp. <a href="https://www.twirpx.com/file/1955799/">https://www.twirpx.com/file/1955799/</a></li> <li>4. Rustenov A. R. Genomics with the basics of genetic engineering: a textbook / A. R. Rustenov. - Almaty: Epigraph, 2019. - 301, [1] s</li> <li>5. Shulembayeva K. K. Chromosomal engineering [Electronic resource]: e-book / K. K. Shulembayeva. - Karaganda: Medet Group, 2019 – - 1 electron. Disk ;</li> <li>5. Zhimulev I. F. General and molecular genetics. Novosibirsk, 2012</li> <li>6. Lynn B. Jorde, John C. Carey, Michael J. Bamshad. Medical Genetics. Fifth edition. Elsevier. – 2016. Pp. 356. <a href="https://www.elsevier.com/books/medical-genetics/jorde/978-0-323-18835-7">https://www.elsevier.com/books/medical-genetics/jorde/978-0-323-18835-7</a></li> <li>7. Friedberg E. C. et al. DNA repair and mutagenesis. ASM Press. WASHINGTON, D.C. 2006. – 1161 p. <a href="https://www.amazon.com/DNA-Repair-Mutagenesis-Errol-Friedberg/dp/1555813194">https://www.amazon.com/DNA-Repair-Mutagenesis-Errol-Friedberg/dp/1555813194</a></li> <li>8. Hartwell L. et al. Genetics : from genes to genomes // New York, NY : McGraw-Hill Education. – 2017. – 849 pp. <a href="https://www.amazon.com/Genetics-Genes-Genomes-Hartwell/dp/007352526X">https://www.amazon.com/Genetics-Genes-Genomes-Hartwell/dp/007352526X</a></li> <li>9. Sithole-Niang I. Genetic Engineering // Published by InTech, Rijeka, Croatia. – 2013. – 137 pp. <a href="http://library.um.edu.mo/ebooks/b28055287.pdf">http://library.um.edu.mo/ebooks/b28055287.pdf</a></li> </ol>

Module designation	<i>Medical Genetics</i>
Semester(s) in which the module is taught	7
Person responsible for the module	<i>Almira Akparova</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	<i>Total workload: 150 Contact hours: Lectures- 15, Seminars - 30 Students Individual Work :105</i>
Credit points	<i>5 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Genetics, Cytology and Histology; Biochemistry; Molecular biology</i>
Module objectives/intended learning outcomes	<p><i>As a result of studying the discipline, the student must know: The structure of the human genome, the mechanisms of genetic processes underlying hereditary diseases; the role of the genetical factors in the occurrence of pathological symptoms; mechanisms of hereditary diseases transmission; methods of diagnosis, treatment, and prevention of genetic disorders, including diseases with the genetic predisposition.</i></p> <p><i>As a result of studying the discipline, the student should be able to: explain the mechanisms of inheritance of hereditary diseases; modern achievements and problems of medical genetics, its relationship with other sciences.</i></p> <p><i>As a result of studying the discipline, the student must have the skills: be able to solve genetic tasks; to apply cytogenetic, molecular cytogenetic and molecular genetic methods.</i></p>
Content	<i>A short history of medical genetics. Genomics and clinical medicine. Characterization of the human genome. Heredity and pathology. Classification of hereditary pathology. Semiotics and clinical diagnostics. Methods for the diagnosis of hereditary diseases. Gene diseases. Chromosomal abnormalities and chromosomal syndromes. Genetics of common diseases. Environmental genetics and pharmacogenetics. Immunogenetics. Molecular genetic basis of carcinogenesis.</i>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	<p>1. Lynn B. Jorde, John C. Carey, Michael J. Bamshad. <i>Medical Genetics</i>. Fifth edition. Elsevier. – 2016. Pp. 356. (in English)</p> <p>2. P.S. Verma, V. K. Agarwal. <i>Cell biology, genetics, molecular biology, evolution and ecology</i>, 2006, India. (in English)  <a href="https://www.amazon.in/Biology-Genetics-Molecular-Evolution-Ecology/dp/8121924421">https://www.amazon.in/Biology-Genetics-Molecular-Evolution-Ecology/dp/8121924421</a></p> <p>3. Ruban, E. D. <i>Human genetics with the basics of medical genetics: a textbook for students / Eleonora Dmitrievna Ruban</i>. - Rostov-on-Don: Phoenix, 2015. -- 319 p. (in Russian)</p> <p>4. Chernoshei, D.A. <i>Immunology // BSMU</i>. – 2018. – 66 p. (in English)  <a href="http://www.ncbi.nlm.nih.gov/pubmed">http://www.ncbi.nlm.nih.gov/pubmed</a></p>

Module designation	<i>Bioinformatics</i>
Semester(s) in which the module is taught	7
Person responsible for the module	<i>Assiya Kussainova</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	<i>Total workload: 150 Contact hours: Lectures- 15, Seminars - 30 Students Individual Work :105</i>
Credit points	<i>5 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Molecular biology</i>
Module objectives/intended learning outcomes	<i>The student must develop the skill of working with databases of biological sequences and structures. Work with different bioinformatics formats for presenting biological data. Be able to use online tools for sequence analysis. Able to solve some problems of molecular biology and genetic engineering.</i>
Content	<i>Working with NCBI bioinformatics portal. Working with literary databases (PubMed, PMC), databases of nucleotide (Gene) and amino acid (UniProtKB) sequences, databases of structures (PubChem, RCSB). Study of different bioinformatics data formats (FASTA, GenBank, mol, sdf, PDB). Alignment of biological sequences. Working with programs of the BLAST series. Vector design.</i>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	<p><i>Hogeweg P. The roots of bioinformatics in theoretical biology. PLoS Comput Biol. 2011 Mar;7(3):e1002021.</i>  <a href="https://pubmed.ncbi.nlm.nih.gov/21483479/">https://pubmed.ncbi.nlm.nih.gov/21483479/</a></p> <p><i>Johnson M, Zaretskaya I, Raytselis Y, Merezuk Y, McGinnis S, Madden TL. NCBI BLAST: a better web interface. Nucleic Acids Res. 2008 Jul 1;36(Web Server issue):W5-9.</i>  <a href="https://pubmed.ncbi.nlm.nih.gov/18440982/">https://pubmed.ncbi.nlm.nih.gov/18440982/</a></p> <p><i>Notredame C, Higgins DG, Heringa J. T-Coffee: A novel method for fast and accurate multiple sequence alignment. J Mol Biol. 2000 Sep 8;302(1):205-17.</i>  <a href="https://pubmed.ncbi.nlm.nih.gov/10964570/">https://pubmed.ncbi.nlm.nih.gov/10964570/</a></p> <p><i>Burley SK, Berman HM, Kleywegt GJ, Markley JL, Nakamura H, Velankar S. Protein Data Bank (PDB): The Single Global Macromolecular Structure Archive. Methods Mol Biol. 2017;1607:627-641.</i>  <a href="https://pubmed.ncbi.nlm.nih.gov/28573592/">https://pubmed.ncbi.nlm.nih.gov/28573592/</a></p> <p><i>Lesk, Arthur. Introduction to Bioinformatics. - 2nd ed. - Moscow: BINOM. Lab. znaniye, 2013</i></p>

Module designation	<i>Mathematical methods in biology</i>
Semester(s) in which the module is taught	7

Person responsible for the module	Akanova K.
Language	Russian, Kazakh
Relation to curriculum	Compulsory / elective
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	Total workload: 150 Contact hours: Lectures- 30 Seminars - 1 Students Individual Work :105
Credit points	5 ECTS
Required and recommended prerequisites for joining the module	mathematics, genetics, molecular biology
Module objectives/intended learning outcomes	<i>The purpose of the training course is to study the methods and methods of statistical analysis of various systems, the formation of skills and practical skills to identify statistical patterns or possible statistical models.</i> <i>As a result of studying the discipline, the specialist must:</i> <i>know: the basic concepts and terms of mathematical modeling; the main methods of constructing mathematical models; basic concepts and terms of statistical analysis;</i> <i>be able to: use computer technology in solving applied problems; use computer technology in solving applied problems;</i> <i>have skills: in using Microsoft Excel tools to solve optimization problems; in using Statistica and Statplus packages for data processing, in organizing and using data; create a database and use it in statistical analysis; empirical study of relationships and dependencies in statistical data.</i>
Content	<i>The main components of mathematical modeling methods treatments results molecular-genetic research. Correlation and regression analysis. Analysis of variance and specification variables.</i>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	1. Brandt Z. Data analysis. Statistical and Computational Methods "MIR", 2012 2. Artyukhov V. G., Pantyavin Mathematical methods in biology. Voronezh State University, 2007 3 Brandt Z. Static methods of observation analysis "MIR", 2012 4 Koldaev V. D. Numerical methods and programming, Forum Publishing House» - INFRA-M, 2009 5.Borovkov V. P., Ivchenko Forecasting in the STATISTIKA system in the WINDOWS environment. "Finance and Statistics", 2009 6 Ermakov S. M. Statistical modeling "Nauka", 2013 7 Dubrova T. A.: Statistical methods of forecasting. - M.: Unity, 2010 8 Dzhaychibekov N. Zh., Pekker Ya. S., Fokin V. A. Methods of data transformation and analysis. Izdat servis, 2008 9 Zhumanova L. K. Statistical analysis and its applications. "Kazak universiteti", 2005

Module designation	Genetics of Development
Semester(s) in which the module is taught	7

Person responsible for the module	<i>Almira Akparova</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	<i>Total workload: 150 Contact hours: Lectures- 15 Seminars - 30 Students Individual Work :105</i>
Credit points	<i>5 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Cell biology, Genetics, Molecular biology</i>
Module objectives/intended learning outcomes	<p><i>As a result of studying the discipline, the student must know: The main issues of developmental genetics: differential expression of genes and their interaction in ontogenesis; the role of exogenous and endogenous factors in the regulation of genes that control the organism's structure and development; developmental genetics of Drosophila and mammals.</i></p> <p><i>As a result of studying the discipline, the student should be able to: explain the fundamental foundations, directions, and prospects of using the achievements of developmental genetics.</i></p> <p><i>As a result of studying the discipline, the student must have the skills: be able to solve genetic tasks; to apply the modern research methods to study the genes involved in the development of the organism.</i></p>
Content	<i>Developmental genetics: a brief history and stages of the formation. The leading role of the nucleus in the regulation of morphogenesis. Regulation of gene expression. Regulation of gene activity during the development of the organism. Homeotic genes, their role in ontogenesis. Embryonic induction. Genes that control embryonic induction. Some genetic aspects of determination and transdetermination. Determination of sex and its molecular genetic basis.</i>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	<p>1. Sally A. Moody. Principles of Developmental Genetics // Elsevier. - 2014. – 734 pp. (In English)  <a href="https://www.elsevier.com/books/principles-of-developmental-genetics/moody/978-0-12-405945-0">https://www.elsevier.com/books/principles-of-developmental-genetics/moody/978-0-12-405945-0</a></p> <p>2. Frasch M. T-box Genes in Development and Disease // Academic Press. – 2017. – 444 pp. (In English)  <a href="https://www.elsevier.com/books/t-box-genes-in-development-and-disease/frasch/978-0-12-801380-9">https://www.elsevier.com/books/t-box-genes-in-development-and-disease/frasch/978-0-12-801380-9</a></p> <p>3. Karvita B. Ahluwalia. Genetics. New Age International Publishers, 2009 (In English)  <a href="https://www.amazon.com/Genetics-Karvita-B-Ahluwalia/dp/8122423906">https://www.amazon.com/Genetics-Karvita-B-Ahluwalia/dp/8122423906</a></p> <p>4 Basics of genetics: textbook. Volume 2 / William S. Klag, Michael R. Cummings, Charlotte A. Spencer, Michael A. Palladino; translated from English by B.O. Bekmanov; Ministry of Education and Science of the Republic of Kazakhstan. - Bass 11. - Almaty: Daur, 2017. (In Kazakh)  <a href="http://www.ncbi.nlm.nih.gov/pubmed">http://www.ncbi.nlm.nih.gov/pubmed</a></p>

Module designation	<i>Cytogenetics</i>
Semester(s) in which the module is taught	7
Person responsible for the module	<i>Almira Akparova</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	<i>Total workload: 150 Contact hours: Lectures- 15 Seminars - 30 Students Individual Work :105</i>
Credit points	<i>5 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Cell biology, Genetics, Cytology and Histology; Biochemistry; MB Molecular biology</i>
Module objectives/intended learning outcomes	<p><i>As a result of studying the discipline, the student must know:</i>  <i>The cellular level of the organization of life; chromosomal basis of the transmission and implementation of genetic information; chromosome changes during cell division; the role of chromosomal abnormalities in the development of pathological conditions.</i></p> <p><i>As a result of studying the discipline, the student should be able to: explain the fundamental foundations of cytogenetics, current achievements, and problems; explain the essence of cytogenetic processes and their mechanisms; analyze information about modern achievements of cytogenetics and its applied use.</i></p> <p><i>As a result of studying the discipline, the student must have the skills: be able to solve cytogenetic tasks; to apply cytogenetic, and molecular cytogenetic methods.</i></p>
Content	<i>Structural and functional organization of chromosomes; principles of cell division; normal and abnormal cell division, its features and consequences; compilation of genetic maps of chromosomes, determination of the karyotype; chromosomal abnormalities and diseases.</i>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	<p>1. Gersen S. L., Keagle M. B. <i>The Principles of Clinical Cytogenetics</i> // Springer New York Heidelberg Dordrecht London. – 2014. – 560 pp.  <a href="http://extras.springer.com/2005/978-1-58829-300-8/1-59259-833-1.pdf">http://extras.springer.com/2005/978-1-58829-300-8/1-59259-833-1.pdf</a></p> <p>2 Arsham M. S., Barch M. J., Lawce H. J. <i>The AGT Cytogenetics Laboratory Manual</i> // John Wiley &amp; Sons. Inc., Hoboken, New Jersey. – 2017. – 1199 pp.  <a href="https://www.amazon.com/AGT-Cytogenetics-Laboratory-Manual/dp/1119061229">https://www.amazon.com/AGT-Cytogenetics-Laboratory-Manual/dp/1119061229</a></p> <p>3. Singh R. J. <i>Practical Manual on Plant Cytogenetics</i> // Taylor &amp; Francis Group. – 2018. – 347 pp.  <a href="https://www.routledge.com/Practical-Manual-onPlantCytogenetics/Singh/p/book/9781498742979">https://www.routledge.com/Practical-Manual-onPlantCytogenetics/Singh/p/book/9781498742979</a>.</p> <p>4 Baranov V.S., Kuznetsova T.V. <i>Cytogenetics of human embryonic development. M. : N-L, 2007.658 p. (in Russian).</i>  <a href="http://www.ncbi.nlm.nih.gov/pubmed">http://www.ncbi.nlm.nih.gov/pubmed</a></p>



Module designation	<i>Molecular Biology and Biochemical methods</i>
Semester(s) in which the module is taught	7
Person responsible for the module	<i>Olga Bulgakova</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	<i>Total workload: 150 Contact hours: Lectures- 30 Seminars - 30 Students Individual Work :120</i>
Credit points	<i>6 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Biochemistry; Genetics; Molecular biology</i>
Module objectives/intended learning outcomes	<p><i>As a result of studying the discipline, the student must know: levels and features of the structural organization of proteins and nucleic acids; general principles of isolation and purification, methods for determining the primary structure of proteins and nucleic acids</i></p> <p><i>As a result of studying the discipline, the student should be able to: use modern material and technical and methodological basis for the physicochemical and biochemical characteristics of proteins and nucleic acids; use in practice modern methods of studying proteins and nucleic acids (PCR, PCR-RFLP, RT-PCR, qPCR, OT-PCR, Sanger sequencing, NGS, microarray, northern blotting, ELISA, western blotting, immunoprecipitation, chromatography types, gene knockout, gene knockdown, Trim-away method, gene cloning, transfection in molecular cloning, CRISPR-Cas)</i></p> <p><i>As a result of studying the discipline, the student must have the skills: interpretation of the received results</i></p>
Content	<i>Ability to plan, organize and conduct an experiment, present experimental data and use the knowledge gained in scientific and industrial activities; to demonstrate ideas about modern advances in molecular biology and apply the knowledge gained in research work</i>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	<p><i>Methods in Molecular Biology. Series Ed.: Walker, John M. 2015-2019 Springer Protocol Database ISSN: 1064-3745 ((includes 5,000 publications on research methods in molecular biology for the latest publishing platform Springer)</i></p> <p><a href="https://www.springer.com/series/7651">https://www.springer.com/series/7651</a></p> <p><i>Alikulov ZA, Bersimbay RI Modern methods of biochemistry and molecular biology.// Textbook, Astana. L.N. LN Gumilyov ENU, 2013, 192 p. (in Kazakh)</i></p> <p><a href="https://www.enu.kz/qilimy-basilimdary/euu-khabarshysy-zhumalynyn-arkhivi/">https://www.enu.kz/qilimy-basilimdary/euu-khabarshysy-zhumalynyn-arkhivi/</a></p>

Module designation	<i>Cytological and histological methods</i>
Semester(s) in which the module is taught	7
Person responsible for the module	<i>Zhannat Bazarbayeva</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	<i>Total workload: 150 Contact hours: Lectures- 30 Seminars - 30 Students Individual Work :120</i>
Credit points	<i>6 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Cytology and histology</i>
Module objectives/intended learning outcomes	<p><i>As a result of studying the discipline, the student must know: light, electron microscopy, digital cytochemical, autoradiographic, methods; structure and function of cells; basic principles of cell theory; the methods of studying the cells and tissues of living organisms</i></p> <p><i>the student should be able work with the main types of light microscopes; microscopy of cytological and histological preparations, cell culture; to prepare histological and cytological preparations and to decorate them with special dyes.</i></p> <p><i>As a result of studying the discipline, the student must have the skills: conducting experimental research at the tissue, cellular and subcellular levels; apply and analyze the knowledge gained in the study of cells in normal and pathological conditions.</i></p>
Content	<i>Know the basic laws and cytological and histological methods, demonstrates knowledge in the field of modern methods for the study of cells. Understands modern problems of biology and uses fundamental biological concepts to solve research problems.</i>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	<ol style="list-style-type: none"> <li><i>1. Myrzagalieva, AB Cytology: textbook / A.B. Myrzagaliyeva; Ministry of Education and Science of the Republic of Kazakhstan. - Almaty: Daur, 2013. – 214 (in Kazakh)</i></li> <li><i>2..Bazarbaeva Zh.M. Cytology and histology. textbook Almaty, 2011, 208. (in Kazakh)</i></li> <li><i>3 Borkhunova E. Cytology and general histology. Methodology for studying drugs. M, 2017 .-- 144 p.4. Nurtazin ST General histology. textbook Almaty, 2010 in Russian)</i></li> <li><i>4. Sarkisov D.S., Perov Yu.L. Microscopic technique. Moscow, 2016., 535 b. (in Russian)</i></li> <li><i>5. Myadelets OD Human histology, cytology and embryology. Part 1.Cytology, embryology and general histology: textbook. - Vitebsk: VSMU, 2014 - 439 p. (in Russian)</i></li> <li><i>6. Polonskaya I.V. Yurasova Polonskaya N.Yu. Cytological examination of cervical smears - Pap-test M., 2016 .-- 168 p. (in Russian)</i></li> </ol>

Module designation	<i>Bioethics with elements of biosafety and biosecurity</i>
Semester(s) in which the module is taught	7
Person responsible for the module	<i>Aigul Dinmukhamedova</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	<i>Total workload: 150 Contact hours: Lectures- 15 Seminars - 30 Students Individual Work :105</i>
Credit points	<i>5 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Microbiology, Virology, Molecular biology, Genetics, Fundamentals of molecular medicine</i>
Module objectives/intended learning outcomes	<i>The purpose of the discipline: the formation of knowledge in the field of bioethics, the expansion of ideas about biological safety and protection of objects for use in scientific and practical activities. As a result of mastering the discipline, the student must: have an idea of history of the development of bioethics, on the principles of biosafety and bioethics when working with bacteria and viruses; know the basic principles of ensuring biological safety in modern biotechnological processes and technologies for creating and the use of genetically transformed biological objects for intensification of production or obtaining new types of products of various destination; be able to apply the knowledge gained in practice</i>
Content	<i>Definition of the concept of bioethics. Ethical theories Bioethics as a social necessity. History and theoretical foundations of modern bioethics. Subject and structure of bioethics. Ethics committees and ethical counseling. Problems of bioethics. Biosecurity concept. Biological protection (bioconservation)</i>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>

Reading list	<ol style="list-style-type: none"> <li>1. <i>Laboratory Biosafety Manual</i>, WHO, 3rd Edition, Geneva, 2004.  <a href="https://www.who.int/csr/resources/publications/biosafety/WHO_DS_CSR_LYO_2004_11w.pdf?ua=1">https://www.who.int/csr/resources/publications/biosafety/WHO_DS_CSR_LYO_2004_11w.pdf?ua=1</a></li> <li>2. Zhumadina Sh.M. <i>Problems of modern biology: textbook</i>. - Almaty: Evero, 2016. - 239p. (in Kazakh)</li> <li>3. Medeuova G.Zh. <i>Ecotoxicology: a textbook in higher education</i> / G.Zh. Medeuova, KN Uncomfortable. - Almaty: Epigraf, 2019. - 2094. (in Kazakh)</li> <li>4. Ushakov E. V. <i>Bioethics. Textbook for universities</i>. Moscow, Yurayt, 2016, 307p.  <a href="https://static.my-shop.ru/product/pdf/222/2214012.pdf">https://static.my-shop.ru/product/pdf/222/2214012.pdf</a> (in Russian)</li> <li>5. Peter A. Singer, A. M. Viens. <i>The Cambridge Textbook of Bioethics</i>, Cambridge University Press, 2008, 555p.  <a href="https://vulms.vu.edu.pk/Courses/BIF402/Downloads/The-cambridge-textbook-of-bioethics.pdf">https://vulms.vu.edu.pk/Courses/BIF402/Downloads/The-cambridge-textbook-of-bioethics.pdf</a></li> <li>6. Khushf G. <i>Handbook of Bioethics</i>, 2004  <a href="https://link.springer.com/">https://link.springer.com/</a></li> <li>7. <i>On the ratification of the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction</i>  <a href="http://adilet.zan.kz/rus/docs/Z070000245">http://adilet.zan.kz/rus/docs/Z070000245</a> pdf (in Russian, in Kazakh)</li> <li>8.  <a href="https://www.un.org/ru/documents/decl_conv/conventions/bacwep.shtml">https://www.un.org/ru/documents/decl_conv/conventions/bacwep.shtml</a></li> <li>9. <a href="http://www.armscontrol.ru/start/rus/">http://www.armscontrol.ru/start/rus/</a></li> <li>10. <a href="http://www.cbsafety.ru/rus/autors.asp">http://www.cbsafety.ru/rus/autors.asp</a></li> </ol>
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Module designation	<i>Geobotany</i>
Semester(s) in which the module is taught	7
Person responsible for the module	<i>Asya Dukenbayeva</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	Lecture (interactive method, communicative method, seminar (case study, communicative method)
Workload (incl. contact hours, self-study hours)	<i>Total workload: 150 Contact hours: Lectures- 15 Seminars - 30 Students Individual Work :105</i>
Credit points	<i>5 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Introduction to biology, Botany</i>
Module objectives/intended learning outcomes	<p><i>The main goal of teaching the “Geobotany” is the study of vegetation, the patterns of its distribution over the territory; knowledge of the structure and dynamics of plant communities, rational use of plant resources.</i></p> <p><i>Objectives of studying the academic discipline:</i></p> <ol style="list-style-type: none"> <li><i>1. Knowledge of research methods of plant communities;</i></li> <li><i>2. study of the composition and structure of phytocenoses;</i></li> <li><i>3. elucidation of the dependence of the phytocoenological composition of the vegetation cover, the floristic composition of phytocenoses and their structure, distribution and spatial relationships on climatic and topographic conditions, on biotic environmental factors and in connection with human activities;</i></li> <li><i>4. study of the formation, variability and changes of phytocenoses in time, depending on external and internal factors;</i></li> <li><i>5. study of interactions between plants in the phytocenosis, depending on the conditions of existence, on the biological and ecological characteristics of plants and their placement;</i></li> <li><i>6. study of interactions and interdependence of phytocenoses and the environment;</i></li> <li><i>7. clarification of the state of vegetation in the geological and historical past and the reflection of the past in modern vegetation;</i></li> <li><i>8. classification of vegetation.</i></li> </ol>
Content	<p><i>The content of the discipline covers the whole range of problems as: Geobotany - the science of plant communities; The role of plants in nature and human life; The diversity of the plant world is the result of a long evolution of the types of structures of plant organisms; The concept of flora and vegetation. Phytocenosis. Formation of phytocenosis; Ecology of phytocenoses. The concept of environmental factors. Light, heat, water, air, soil factors. Relief as an indirectly acting ecological factor; Phytocenosis structure; Vertical and horizontal structure of the phytocenosis. Dynamics of plant communities; Seasonal and seasonal changes in phytocenoses. Succession; Phytocenoses classification; Ecological and biological composition of the cenosis flora as an indicator of connection with the environment. Plants are indicators; Dynamics of phytocenoses. Variability, shifts, their causes and classification; Regularities of the territorial distribution of vegetation cover;</i></p>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>

Reading list	<ol style="list-style-type: none"> <li>1. Botany. Morphology and anatomy of plants. Moscow. "Enlightenment", 2018 – - 488 p.</li> <li>2. Dukenbayeva A.D. Plant systematics: a textbook / A.D. Dukenbayeva. - Almaty: Epigraph, 2019. - 193, [1] b.</li> <li>3. Botany : textbook / S. K. Imankulova, L. B. Seilova, K. I. Shalabaev, D. M. Amanbekova, A.Sh Shokanova ; Ministry of education and science of the Republic of Kazakhstan. - Almaty : Association of higher educational institutions of Kazakhstan, 2016. - 280, [1] with</li> <li>4. Karipbaeva N. Sh. Illustrated determinant of flowering plants / N. Sh. Karipbaeva, V. V. Polevik, B. M. Silybaeva. - Almaty : Evero, 2019. - 246, [1] p.</li> <li>5. Berkinbay O. B. Bioresources of Kazakhstan. Volume 1 (Fish, amphibians, reptiles). Almaty, 2013</li> <li>6. Botany. Textbook for universities: in 4 volumes / P. Zitte, E. V. Weiler, J. V. Kaderait, A. Brechinsky, K. Kerner. - Moscow: Akademiya, 2007 – - 256 p.</li> <li>7. Wildlife reforms. Materials of the conf. On problems of Landscape and biological diversity conservation. Karkaralinsk., 2003., 6/p.</li> <li>8. "Memlekettik tabigi-koryk korynyn problemalary men damu perspektivalary" maselesi boyynsha Parlamenttik tyndau. Astana., 2004. 223bet.</li> <li>9. Ecology and sustainable development, No. 6, Astana, 2001</li> <li>10. Sapargaliev G. S., Baitulin T. I. Biological safety of Kazakhstan. Report. Almaty., 2005.</li> <li>11. Geobotany with the basics of agrophytocenology: a textbook / Saidova N. V., Pakhomova V. M.; M-vo sel. khoz-va Ros. Federation, Federal State Educational Institution. institution of higher Prof. education " Kazan State Agrarian University. un-t" . Yoshkar-Ola: String, 2011. - 182 p.</li> </ol>
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Module designation	<i>Industrial practice</i>
Semester(s) in which the module is taught	7
Person responsible for the module	<i>Nurmukhambetova Gaziza, Meruert Salkymbaeva</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	<i>Practical Classes</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload: 150 Contact hours: Lectures- 15 Seminars - 30 Students Individual Work :105</i>
Credit points	<i>6 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Microbiology, Biochemistry, Plant Physiology, Human and animal physiology</i>
Module objectives/intended learning outcomes	<p><i>To know:</i></p> <ul style="list-style-type: none"> <li><i>- modern research directions and the latest achievements in the field of biology and prospects for their use in various fields of national economy, medicine, biotechnology;</i></li> <li><i>- methodological techniques for setting up a biological experiment.</i></li> </ul> <p><i>be able to:</i></p> <ul style="list-style-type: none"> <li><i>- develop and set up an experiment;</i></li> <li><i>- interpret the results of the experiment;</i></li> <li><i>- apply methods of statistical data analysis, including the use of modern information technologies;</i></li> </ul> <p><i>Possess:</i></p> <p><i>skills of working with modern equipment in laboratory and field studies of biological objects</i></p>
Content	<p><i>Industrial practice is aimed at forming students' ideas about the chosen specialty, provides an opportunity for in-depth practical development of professional activity.</i></p> <p><i>The objectives of the production practice are: to deepen and consolidate the theoretical knowledge gained in the course of training, to gain skills for the practical use of professional knowledge gained during theoretical training; to get acquainted with the specifics of the bachelor's professional activity in a particular production, to form a professional position of a specialist, a style of behavior, and to master professional ethics.</i></p>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	<ol style="list-style-type: none"> <li><i>1. The Law of the Republic of Kazakhstan "On sanitary and epidemiological welfare of the population" (in Kazakh)</i></li> <li><i>2. Industrial practice. Curriculum for the specialty "Information systems technologies". / I. I. Ignatenko. (in Russian)</i></li> <li><i>3. Report on the research work. Structure and rules of registration: GOST 7.32-2011. (in Russian)</i></li> <li><i>4. Regulations on the procedure for conducting practical training of students of educational institutions of higher professional education. Ministry of Education of the KZ. (in Kazakh)</i></li> <li><i>5. Regulations on the practice of students of the L. N. Gumilyov Eurasian National University (in Kazakh)</i></li> </ol>

Module designation	<i>Pre – diploma practice</i>
Semester(s) in which the module is taught	7
Person responsible for the module	<i>Nurmukhambetova Gaziza, Meruert Salkymbaeva</i>
Language	<i>Russian, Kazakh</i>
Relation to curriculum	<i>Compulsory / elective</i>
Teaching methods	<i>Practical Classes</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload: 150 Contact hours: Lectures- 15 Seminars - 30 Students Individual Work :105</i>
Credit points	<i>6 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Biochemistry, Botany, Zoology, Molecular Biology</i>
Module objectives/intended learning outcomes	<p><i>Based on the results of the internship, students must:</i></p> <p><i>Know:</i>  <i>administrative documents, methodological and regulatory materials in the field of working with biological objects;</i></p> <p><i>Be able to:</i>  <i>clearly formulate tasks, develop field and laboratory research programs;</i>  <i>make generalizations and conclusions, formalize the results in the form of scientific reports, articles, etc.</i></p> <p><i>Possess:</i>  <i>The skills of conducting field and laboratory research in order to obtain scientific material that allows you to characterize the object under study as a whole, its individual components or groups of organisms by appropriate methods.</i></p>
Content	<p><i>Apply knowledge of the basics of evolutionary theory, modern ideas about structural and functional organization of the genetic program living objects and methods of molecular biology, genetics and developmental biology in professional activities</i></p> <p><i>For planning and conducting biological experiments, the principles of conservation, safety and labor protection are given, skills of working with modern scientific equipment and living objects are applied.</i></p>
Exams and assessment formats	<i>two oral rating (20 minutes each) and one final oral exam (40 minutes)</i>
Study and examination requirements	<i>The final score, consists of the results of the rating control and the exam, with 60% being the rating control, 40% - the result of the exam. Students must have a final grade of 50% or higher to pass</i>
Reading list	<ol style="list-style-type: none"> <li><i>1. Regulations on the thesis: Nur-Sultan Enu, 2013 (in Kazakh)</i></li> <li><i>2. Occupational safety and health: A textbook for universities/ Edited by O. N. Rusak St. Petersburg: MANEB, 2011. (in Russian)</i></li> <li><i>3. The Law of the Republic of Kazakhstan "On Environmental Protection" (in Kazakh)</i></li> <li><i>4. How to formalize a scientific work: Burdin K. S., Veselov P. V. - M.: Higher School, 2013. - 152 p. (in Russian)</i></li> <li><i>5. Position on the practice of students of the Eurasian national University. L. N. ENU (in Kazakh)</i></li> </ol>