

Al-Farabi Kazakh National University
Faculty biology and biotechnology
Department of Biophysics, Biomedicine and Neuroscience



Karmanbayeva M.S.
"12" 09 2023

EDUCATIONAL-METHODICAL COMPLEX OF DISCIPLINE

SPTPB 5207- Modern problems of theoretical and practical biology

«7M01504 - Biology» speciality

Course – 1
Semester – 2
Number of credit-9
Lecture-30 hours
Seminar-60 hours
IWS-7

Almaty 2023

Educational-methodical complex of the discipline is compiled by Ashirova Zh.
(PhD)

Based on educational program of Specialty «7M01504 - Biology »

Considered and recommended at the meeting of the department Biophysics,
Biomedicine and Neuroscience

« 28 » 08 2023 year, protocol №1

Head of Department
Professor  A. Kustubayeva

SYLLABUS
Spring semester 2022-2023 academic years
on the educational program «Modern problems of theoretical and practical biology»

Discipline's code	Discipline's title	Independent work of students (IWS)	Number of credits			Number of credits	Independent work of student with teacher (IWST)	
			Lectures (L)	Practical training (PT)	Laboratory (Lab)			
SPTPB 5207	Modern problems of theoretical and practical biology	98	3	9	-	5	7	
ACADEMIC INFORMATION ABOUT THE COURSE								
Form of education	Type of course	Types of lectures		Types of practical training	Form of final control			
Full-time	Theoretical, Practical	Problematic		Problematic solving, Situational tasks	Written			
Lecturer	Ashirova Zhadyra Berdimuratovna							
e-mail, Telephone number	Ashirova.zhadyra@kaznu.kz, +77714670970							
Teacher of practical lessons	Ashirova Zhadyra Berdimuratovna							
Purpose of the course	Expected Learning Outcomes (LO)* As a result of studying the discipline the undergraduate will be able to:			Indicators of LO achievement (ID) (for each LO at least 2 indicators)				
Assessment of feasibility of using modern biological theories and methods for conducting research ability formation	1. Achievements in modern problems of theoretical and practical biology and overall development perspective.			1.1 Provides general biological theoretical and practical knowledge from the main departments of biology and forms theoretical and practical thinking for them.				
	2. Learns the rules for the organic world system and applies them in practice.			1.2 Explains general theoretical axioms and specific features of biosystems. 2.1 Learns the laws of modern biological evolution.				
	3. To evaluate the use of scientific research methods by understanding and mastering the physiological and biochemical meaning of modern life.			3.1 Analyzes the laws that reveal the physiological and biochemical meaning of life. 3.2 Explains the meaning of Engels' first law and Bertalanffy laws				
	4. Synthesizes information by mastering and studying the genetic-cybernetic essence of modern life.			4.1 Analyzes and acquires information that reveals the genetic-cybernetic meaning of life. 4.2 Biological, technical, social, etc. learns information about the general principles of management in systems.				
	5. Understands, evaluates and proves the meaning of the laws of homogeneity and diversity of life.			5.1 Understands the origin and meaning of the law of homogeneity and diversity of life. 5.2 understands and analyzes Saint-Hilaire's law.				
Prerequisites	Evolution theory							
Post requisites	Modern educational technologies in biology							
Information resources **	Main Literature:** 1. Doris L MacKinnon, Jakob Von Uexkull. Theoretical Biology. – Franklin Classics Trade Press, 2018. – 384 p. 2. Daniel S. Szumski. Introduction to Theoretical Biology. – CreateSpace Independent Publishing Platform, 2013. – 114 p. 3. Биологическая химия / Под ред. С.Е.Северина, М: «Гэотар Медия», 2011. – 145 с.							

4. Максимов, Г.В. Теоретические и практические аспекты использования биотехнологии и генной инженерии / Г.В. Максимов. – М.: Вузовская книга, 2014.

5. Doris L. Mackinnon, Jakob von Uexküll. Theoretical Biology. - Andesite Press, 2015. – 386 p.

6 Teaching and Digital Technologies: Big Issues and Critical Questions Paperback. January 8, 2016 by Michael Henderson (Editor), Geoff Romeo (Editor)

7. Forsyth, E. (2016). Using videoconferencing for professional development and meetings. Computers in Libraries, 36(7), 11-14.

8. Remis, K. K. (2015). LMS enhances K12 instruction: Systems increase engagement, provide quick access to digital resources and help teachers with administrative tasks. District Administration, Digital Edition, May 27, 2015 <http://www.districtadministration.com/article/lms-enhances-instruction>

9. Dominic, M. (2016). Handbook of Research on Mobile Learning in Contemporary Classrooms. Hershey, PA: IGI Global.

Additional Literature:

5. Korakakis, G. G., Pavlatou, E. A., Palyvos, J. A. and Spyrellis, N. N. (2009) “3D visualization types in multimedia applications for science learning: A case study for 8th grade students in Greece”, Computers & Education, Vol 52, pp 390-401.

6. Biancarosa, G., & Griffiths, G. C. (2012). Technology tools to support reading in the digital age. The Future of Children, 22(2), 139-160. http://www.jstor.org/stable/23317415?seq=1&cid=pdf-reference#page_scan_tab_contents

Internet resources (at least 3-5)

1. <http://elibrary.kaznu.kz/ru>
2. <https://mosmetod.ru/>
3. <https://works.doklad.ru/>
4. <https://research-journal.org/>
5. <https://elibrary.com>
6. <https://www.twirpx.com>
7. <https://elibrary.ru/>

Software

1. <https://html.com/>
2. <https://wordpress.com/>
3. <https://www.sitecore.com/knowledge-center/>
4. <https://visme.co/blog/how-to-design-a-website/>

Academic course policy

The academic policy of the course is determined by [the Academic Policy and the Policy of Academic Integrity of Al-Farabi Kazakh National University](#) .

Documents are available on the main page of IS Univer .

Integration of science and education. The research work of students, undergraduates and doctoral students is a deepening of the educational process. It is organized directly at the departments, laboratories, scientific and design departments of the university, in student scientific and technical associations. Independent work of students at all levels of education is aimed at developing research skills and competencies based on obtaining new knowledge using modern research and information technologies. A research university teacher integrates the results of scientific activities into the topics of lectures and seminars (practical) classes, laboratory classes and into the tasks of the IWST, IWS, which are reflected in the syllabus and are responsible for the relevance of the topics of training sessions and assignments.

Attendance. The deadline for each task is indicated in the calendar (schedule) for the implementation of the content of the course. Failure to meet deadlines results in loss of points.

Academic honesty. Practical/laboratory classes, IWS develop the student's independence, critical thinking, and creativity. Plagiarism, forgery, the use of cheat sheets, cheating at all stages of completing tasks are unacceptable.

Compliance with academic honesty during the period of theoretical training and at exams, in addition to the main policies, is regulated by [the "Rules for the final control"](#) , ["Instructions for the final control of the autumn / spring semester of the current academic year"](#) , ["Regulations on checking students' text documents for borrowings"](#) .

Documents are available on the main page of IS Univer .

Basic principles of inclusive education. The educational environment of the university is conceived as a safe place where there is always support and equal attitude from the teacher to all students and students to each other, regardless of gender, race / ethnicity, religious beliefs, socio-economic status, physical health of the student, etc. All people need the support and friendship of peers and fellow students. For all students, progress is more about what they can do than what they can't. Diversity enhances all aspects of life.

All students, especially those with disabilities, can receive counseling assistance by phone / e- mail [+77714670970](tel:+77714670970) or via video link in MS Teams ashirova.zhadyra@kaznu.kz
Integration MOOC (massive open online course). In the case of integrating MOOC into the course, all students need to register for MOOC. The deadlines for passing MOOC modules must be strictly observed in accordance with the course study schedule.
ATTENTION! The deadline for each task is indicated in the calendar (schedule) for the implementation of the content of the course, as well as in the MOOC. Failure to meet deadlines results in loss of points.

INFORMATION ABOUT TEACHING, LEARNING AND ASSESSMENT

Score-rating letter system of assessment of accounting for educational achievements				Assessment Methods															
Grade	Digital equivalent points	points, % content	Assessment according to the traditional system	<p>Criteria-based assessment is the process of correlating actual learning outcomes with expected learning outcomes based on clearly defined criteria. Based on formative and summative assessment.</p> <p>Formative assessment is a type of assessment that is carried out in the course of daily learning activities. It is the current measure of progress. Provides an operational relationship between the student and the teacher. It allows you to determine the capabilities of the student, identify difficulties, help achieve the best results, timely correct the educational process for the teacher. The performance of tasks, the activity of work in the classroom during lectures, seminars, practical exercises (discussions, quizzes, debates, round tables, laboratory work, etc.) are evaluated. Acquired knowledge and competencies are assessed.</p> <p>Summative assessment - type of assessment, which is carried out upon completion of the study of the section in accordance with the program of the course. Conducted 3-4 times per semester when performing IWS. This is the assessment of mastering the expected learning outcomes in relation to the descriptors. Allows you to determine and fix the level of mastering the course for a certain period. Learning outcomes are evaluated.</p> <table border="1"> <thead> <tr> <th>Formative and summative assessment</th> <th>Points % content</th> </tr> </thead> <tbody> <tr> <td>Activity at lectures</td> <td>5</td> </tr> <tr> <td>Work in practical classes</td> <td>20</td> </tr> <tr> <td>Independent work</td> <td>25</td> </tr> <tr> <td>Design and creative activity</td> <td>10</td> </tr> <tr> <td>Final control (exam)</td> <td>40</td> </tr> <tr> <td>TOTAL</td> <td>100</td> </tr> </tbody> </table>		Formative and summative assessment	Points % content	Activity at lectures	5	Work in practical classes	20	Independent work	25	Design and creative activity	10	Final control (exam)	40	TOTAL	100
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Final control (exam)	40																		
TOTAL	100																		
A	4.0 _	95-100	Great																
A-	3.67	90-94																	
B+	3.33	85-89	Fine																
B	3.0	80-84																	
B-	2.67	75-79																	
C+	2.33	70-74																	
C	2.0	65-69	Satisfactorily																
C-	1.67	60-64																	
D+	1.33	55-59																	
D	1.0	50-54	Unsatisfactory																
FX	0,5	25-49																	
F	0	0-24																	

Calendar (schedule) for the implementation of the content of the course. Methods of teaching and learning.

A week	Topic name	Number of hours	Max. ball
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Module 1 Nature and importance of theoretical and practical biology (the number of modules, the name of the topics, as well as their distribution by week is set by the teacher)

1	Lec 1. The purpose, objectives and relationship of the subject of theoretical and practical biology in biological education with other sciences	1	
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	Sem 1. To determine how and why theoretical and practical biology in biological education can be used in their practice, with reference to relevant concepts, Principles and theories	2	10
2	Lec 2. Laws for the organic world system	1	
	Sem 2. The Law of Homogeneity and Diversity of Life or Saint-Hiler's Law.	2	10
3	Lec 3. Current laws of biological evolution	1	
	Sem 3. Principles of the Global Law of Life, or Vernadsky's First Law	2	10
	IWS 1. Consultation on the implementation of IWS1 on the topic: Advising on the implementation of IWS1 ATTENTION: (number of IWS (2-5), IWST (6-7) Independent work of students (IWS, colloquium, etc.) is estimated at 55-60% of the total points.	1	40
4	Lec 4. Current theoretical laws for the individual development of the organism.	1	
	Sem 4. The Law of Organic Expediency or Aristotle's Law.	2	6
	IWST 2. Colloquium – logical task Modern views on the nature and importance of theoretical and practical biology. Information on scientific works of domestic and foreign scientists	1	4
5	Lec 5. Physiological and biochemical significance of modern life	1	
	Sem 5. The law of natural selection or Darwin's law	2	10
Module 2. Application of theoretical laws in practice			
6	Lec 6. The genetic-cybernetic meaning of modern life	1	
	Sem 6. The law of ontogenetic aging and renewal or Crank's law	2	10
7	Lec 7. Planet Life and Human.		
	Sem 7. The law of unity of ontogenesis or Driesch's law		
	IWST 3. Consultation related to IWS 2. task	1	
LEVEL CONTROL 1			100
8	Lec 8. Psychology of personality and interpersonal relationships in biological education using a new technologies	1	
	Sem 8. The law of the chemical structure of living things or Engels' first law	2	8
	IWS 2. Acquaintance and analysis of scientific works on diversity of laws of theoretical biology and their importance Written Essay with practical explanation with examples, references and summary. Word file no less than 2 pages, New Roman shrift #12.		18
9	Lec 9. Modern chronobiology	1	
	Sem 9. The law of systematic structure of biochemical processes or Bertalanffy law	2	8
10	Lec 10 Hierarchy of rhythm in a multicellular organism.	1	
	Sem 10. The law of biological phenomena in agreement with information, or Waddington's law	2	8
	IWST 4. Colloquium Consultation on the implementation of IWS3	1	
	Module 3 Overview of the system of means of teaching of biology		
11	Lec 11 . Current scientific, philosophical and religious views on life	1	
	Sem 11. Law of continuity and discreteness of biological information, or Morgan-Ephrussi law	2	8
12	Lec 12 Basic laws of modern ecology. The concept of the noosphere.	1	
	Sem 12. The law on the role of labor in the formation and development of a person, or the second law of Engels	2	8
	IWST 5. Consultation questions-answers session	1	

13	Lee 13 Current concepts of consciousness and thinking	1	
	Sem 13. The law of the biosphere role of consciousness or Vernadsky second law	2	8
	IWS 3. Importance and application of theoretical laws in practical biology Report in presentation format, made in Power point, no less than 10 slides with conclusion and used resources.		18
14	Lee 14 Modern scientific and technical revolution and global environmental crisis. Cybernetics.	1	
	Sem 14. Chrono adaptation and transmeridional flights	2	4
	IWST 6. Colloquium Make a structural and logical diagram of the read material – logical task	1	4
15	Lee 15 Biometrics, the role of theoretical biology in modern problems	1	
	Sem 15. Laws - ways to be accepted as law.	2	8
	IWST 7. Consultation on examination preparation	1	
LEVEL CONTROL 2			100

Dean _____ Kurmanbayeva

Head of Department _____ A. Kustubeva

Lecturer _____ Zh. Ashirova



