

Discipline designation	Molecular Biology
Semester(s) in which the discipline is taught	7
Responsible teacher	Khamrayeva Nafisa Tirkashevna, Doctor of Philosophy (PhD) in Biological Sciences, Associate Professor
Language of instruction	Uzbek
Connection to the curriculum	Subject of choice
Study load (including contact hours, SRS)	Total workload: 150 h Contact hours: Lecture-20 h Practice-20 hours Laboratory -20 hours SRS 90 h
ECTS	5
Prerequisites	General chemistry, Inorganic chemistry, Organic chemistry, Biochemistry
Goals of the discipline	<p>The purpose of the discipline is the formation of theoretical knowledge, practical skills, the chemical composition, structure and functions of living organisms, the exchange of high-molecular compounds and the participation of intermediate products of this exchange in general metabolism.</p> <p>Learning outcomes</p> <ul style="list-style-type: none"> - reveal the molecular biological mechanisms of the body's vital activity using the example of some high-molecular compounds and their metabolism; - analyze theoretical knowledge obtained during laboratory work; - work and observe instruments used in molecular biology; - analyze the results of observables, processes occurring in their systems, and scientifically interpret; -describe and explain the results of experiments; -carry out practical work and draw conclusions from it; - use the knowledge gained from studying molecular biology in professional activities; -formulate scientific hypotheses when discussing literature and own data.
Contents of the lesson	<p>Content</p> <ol style="list-style-type: none"> 1.Goals and objectives, methods, history of the molecular biology course 2.Protein structures. 3. Structures of nucleic acids. 4.Types of DNA structure. Primary and secondary structures of DNA. 5.Structure and functions of the RNA molecule. Messenger RNA and genetic code 6. Transfer RNA and aminoacyl-t-RNA synthetases. Ribosome 7.DNA replication. Replication in prokaryotic and eukaryotic organisms 8.Telomeres. DNA repair 9.DNA recombination 10. Transcription. Processing of mRNA. 11. General idea of amino acid activation. 12.Initiation of broadcast. 13. Translation elongation, termination. 14.Modification of proteins, cotranslational twisting. 15. Planned cell death. Apoptosis.
Exam form	Writing.

<p>Training and examination requirements</p>	<p>Complete mastery of theoretical and methodological concepts in the subject, the ability to correctly reflect the results of analysis, independently reason about the processes being studied and carry out tasks in the current, intermediate forms of control, and pass a written exam on the final control.</p> <p>When drawing up IC questions, deviations from the content of the discipline program are not allowed. The bank of IC questions for each subject is discussed at the meeting and approved by the head of the department.</p> <p>When compiling IR tickets, the IR question bank is used; the number (3-5 questions) of questions in the ticket should be in a 50/50 ratio, depending on the content of classroom and independent learning.</p> <p>No later than 1 week before the start of the final control, tickets signed by the head of the department, enclosed in an envelope, are sealed by the dean's office and opened 5 minutes before the start of the exam in the presence of students. IR duration is 80 minutes. Answers to IR questions are recorded in notebooks with the seal of the dean's office. After completion of the IR work, the work is immediately encrypted by a representative of the dean's office, and the notebooks are handed over to the commission for verification. From the moment of completion of the IC, a period of 72 hours is allotted for checking and posting the results on the electronic platform.</p> <p>The teacher who taught the students in this subject is not involved in the process of conducting the exam and checking the students' answers.</p> <p>Student(s) who are dissatisfied with the IC results may submit a written or oral appeal within 24 hours of the publication of the IR results. Complaints filed within 24 hours of publication IIR results are not accepted.</p>
<p>Bibliography</p>	<ol style="list-style-type: none"> 1. P. Mirkhamidova, D. Babakhanova, G. Umarova, D. Kadirova. Biological chemistry. Publishing house Navruz. Tashkent -2018 2. P.Mirxamidova, DBBabaxanova, G'.I.Muxamedov. "Biokimyo (Amaliy mashg'ulotlar) o'quv qo'llanma. Ishonchli hamkor nashriyoti. Toshkent-2021 3. Zikiryayev A., Mirhamidova P. "Biokikyo"-T.: "Tafakkur bo'stoni" 2013 4. MNValixonov, SNDolimova, GBUmarova, P.Mirxamidova "Biologik kimyo va molekulyar biologiya" (Molekulyar biologiya 2-qism) T. "Navro'z" 2016 y. 5. Mirkhamidova P, Bobokhonova D, Zikiryayev A. Biologist kimyo va molecular biology (1-kism). Tashkent. Navruz. 2018 6. David Klark, Nanette, Pasdernik, Michelle Megchee – Molecular biology, Trird Edition, Academic Cell. USA: 2018. pp 1006. 7. B. Alberts, D. Bray, K. Hopkin, A. Johnson, J. Lewis, M. Raff, K. Roberts, P. Walter. Fundamentals of molecular biology of cells.-M.: "Laboratory of Knowledge", 2018 8. Mirkhamidova P., Shakhmurova G.A., Tuychieva D.Kh. , Makhmudova K.H. Molecular biology. Laboratory workshop. Tashkent, 2023.
<p>Scope of assessment criteria and procedure</p>	<p>CURRENT CONTROL</p> <p>Purpose: Determining and assessing the student's level of knowledge, practical skills, and competencies on course topics.</p> <p>Instructions: The student's activity in daily classes is assessed through the student's mastery of course topics, as well as constructively interpreting and analyzing the educational material, developing module-specific skills, acquiring practical skills (in terms of quality and the specified number) and competencies, solving problem situations aimed at applying professional practical skills, working in a team, preparing presentations, etc.</p> <p>Current control form:</p> <p>Activity in lessons</p>

Preparing educational materials
Working with sources within the subject
Using educational technologies
Working in a team
Preparing presentations
Working with projects

INTERMEDIATE CONTROL

Purpose: Assessing the student's knowledge and practical skills and level of mastery of lecture material after completing the relevant section of the course.

Form and procedure of intermediate control: Midterm examination is held during the semester during the training sessions after the completion of the relevant module of the curriculum of the subject. Midterm examination is held once in written form within the framework of this subject. Midterm examination questions cover all topics of the subject.

Independent learning:

Purpose: Independent learning is aimed at fully covering the content of this course, expanding the theoretical knowledge acquired, and establishing independent learning activities for students.

Form and procedure of independent education: Independent work assignments are completed in the form of an educational project, presentation, case study, problem solving, information search, digest, colloquium, essay, article, abstract, etc.

Completed assignments for independent study are placed in the electronic system and checked based on the anti-plagiarism program and evaluated by the subject teacher.

In this case, the uniqueness of the completed assignment should not be less than 60%, otherwise the assignment will not be accepted for assessment.

The number of independent work assignments, depending on the nature of the subject, should not be less than 3 for one subject (module).

Independent work assignments account for 60% of the points allocated for current and intermediate control.

Independent learning task 1: Preparation of project work based on independent learning topics

Independent learning task 2: Preparing sample video lessons based on specialized subject topics.

Independent learning task 3: Preparation of open lesson plans in specialized subjects using interactive methods.

Independent learning task 4: Analysis of educational normative documents for specialized subjects and preparation of presentations.

FINAL CONTROL

Purpose: The final examination is held at the end of the semester to determine the level of mastery of the student's theoretical knowledge and practical skills in the relevant subject. The final examination is held at a specified time according to the examination schedule created by the Registrar's Office on the electronic platform.

Requirements: The student must have passed the current control, intermediate control and independent learning assignments by the deadline for the final control type in the relevant subject.

A student who has not passed the current control, intermediate control and independent learning assignments, as well as who has received a score in the range of "0-29.9" for these assignments and control types, is not included in the final control type.

	<p>Also, a student who has missed 25 percent or more of the classroom hours allocated to a subject without a reason is excluded from this subject and is not included in the final control type and is considered not to have mastered the relevant credits in this subject.</p> <p>A student who has not passed or was not included in the final control type and has received a score in the range of "0-29.9" for this type of control is considered to be an academic debtor.</p> <p>Final control form: The final examination in this subject will be conducted in written form.</p> <p>If the final examination is conducted in written form, the requirements for assessment must also be reflected.</p>				
Criteria for assessing student knowledge	5 stars	100 points		Evaluation criteria	
	5	90-100	Excellent	When a student is considered to be able to make independent conclusions and decisions, think creatively, observe independently, apply the knowledge he has gained in practice, understand, know, express, and narrate the essence of the subject (subject), and have an idea about the subject (subject)	
	4	70-89,9	Good	When the student is considered to be able to observe independently, apply the knowledge he has gained in practice, understand, know, express, and narrate the essence of the subject (subject), and has an idea about the subject (subject)	
	3	60-69,9	Satisfactory	When the student is found to be able to apply the knowledge he has gained in practice, understands, knows, can express, and narrate the essence of the subject (subject), and has an idea about the subject (subject)	
	2	0-59,9	Unsatisfactory	When it is determined that the student has not mastered the science program, does not understand the essence of the science (subject), and does not have an idea about the science (subject)	
Course evaluation criteria and procedure	Control type	Total points allocated	Control (task) form	Distribution of points	Qualifying score
	Current control	30 points	System tasks	20 points (divided by the number of tasks)	18 points
			Student activity (in seminars, practical, laboratory classes)	10 points	
	Intermediate	20 points	Supervision:	10 points	12 points

	control		Written work		
			System tasks	10 points (divided by the number of tasks)	
	Final inspection	50 points	Written assignment (5 questions)	50 points (10 points per question)	30 points
	<p><i>* Note: 60% of the points allocated for current and intermediate control are allocated to independent work assignments. Independent work assignments are evaluated as system assignments through the electronic platform.</i></p>				