

Name of the Discipline	Fundamentals of Genetics and Selection
Semester(s)	5/6
Responsible teacher	Pardayeva Khurshida Olimjonovna, Senior Lecturer, Department of Biology and Teaching Methods Khorazov Nuriddin Altinbek oglu, intern-teacher
Language of teaching/learning	Uzbek
Connection to the curriculum	compulsory
Academic workload (including contact hours and self-study)	Total workload: 300 hours Contact hours – Lecture 60 h Practical work 90 hours. SsIW - 150 hours.
ECTS	10
Prerequisites	Botany, Zoology, Developmental Biology, Human Anatomy and Physiology, Ecology and Nature Conservation
Discipline objectives / Learning Outcomes	<p>The purpose of the discipline is to form a system of knowledge on the fundamental Genetic Basis of the emergence and functioning of living organisms and biocenoses on Earth, their stability and variability.</p> <p><b>Learning outcomes:</b></p> <ul style="list-style-type: none"> <li>- know modern approaches and innovations in teaching Genetics and Selection;</li> <li>- to develop skills in using modern educational tools in classes on Genetics and Selection;</li> <li>- apply interactive methods in teaching activities when teaching topics of Genetics and Selection;</li> <li>- assess the levels of activity of students in the field of education;</li> <li>- know about modern approaches and innovative technologies;</li> <li>- be used in teaching and conducting scientific research in the field of genetics and selection;</li> <li>- know modern requirements for teaching Genetics and Selection;</li> <li>- classify the unity and consistency of the content, means, methods and forms of the science of genetics and selection;</li> <li>- use educational resources in the classroom;</li> <li>- have processing and generalization skills;</li> <li>- apply modern innovative pedagogical technologies in genetics and selection lessons;</li> <li>- teach how to organize classes on genetics and selection based on modern requirements;</li> <li>- use modern approaches and innovations in professional activities;</li> <li>- be aware of scientific achievements in genetics and selection, and application in production.</li> </ul>
Lessons' contents	<p>Content</p> <ol style="list-style-type: none"> <li>1. History of the Development of Genetics.</li> <li>2. Cytological and Biochemical basis of asexual reproduction.</li> <li>3. Cytological and Biochemical basis of sexual reproduction.</li> <li>4. Mendel's First and Second Laws.</li> <li>5. Mendel's Third Law.</li> </ol>

	6. Genetics of sex. Sex-linked inheritance of traits. 7. Genetics of sex. Inheritance of traits in combination with gender. 8. Linked inheritance of traits and crossing over. 9. Principles of genetic mapping. 10. Interaction of non-allelic genes, complementarity and epistasis. 11. Interaction of non-allelic genes: inheritance of traits under the influence of polymers. 12. Inheritance of traits under the pleiotropic and modifying action of genes. 13. Cytoplasmic inheritance; 14. Variability and its types. Genotypic variability. 15. Variability and its types. Phenotypic variability. 16. Molecular bases of heredity. 17. Population genetics. Genetic structure of populations and genetic basis of evolution. 18. Genetic engineering and biotechnology; 19. Introduction to human genetics; 20. Methods for studying human genetics; 21. Linked inheritance of traits in humans and the genetic map. 22. Medical genetics. 23. Selection. Goals and objectives of selection. 24. The doctrine of N.I. Vavilov about the centers of origin of cultivated plants. 25. Varieties, breeds and strains. 26. Hybridization methods. 27. Plant breeding. 28. Animal selection 29. Selection of microorganisms. 30. Scientific research in the field of genetics and selection in Uzbekistan
The exam format	Written
Teaching/learning and examination requirements	<p>Complete mastery of theoretical and methodological concepts in the discipline, 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 written work on the final control.</p> <p>When drawing up final exam questions, deviations from the content of the discipline program are not allowed. The bank of final exam questions for each discipline is discussed at the meeting and approved by the head of the department.</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. Final exam duration is 80 minutes. Answers to final exam questions are recorded in copybooks 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 copybooks are handed over to the commission for verification. From the moment of completion of the final exam, a period of 72 hours is allotted for checking and posting the results on the electronic platform. The teacher who taught the students in this discipline is not involved in the process of conducting the exam and checking the students' answers.</p> <p>Student(s) who are dissatisfied with the final exam results may submit a written or oral appeal within 24 hours of the publication of the final exam results. Complaints submitted after 24 hours from the publication of the final exam results will not be accepted.</p>

Bibliography	<p>1.G'ofurov A.T., Fayzullaev S.S., I.T.Azimov., U.E.Raxmatov."Genetika va evolutsion ta'limot" Genetika Toshkent, "Tafakkur", 2021 y.</p> <p>2.G'ofurov A. T., Fayzullaev S.S." Genetika va evolutsion ta'limot " 2013 y.</p> <p>3. U. E. Raxmatov., G'ofurov A.T., Fayzullaev S.S., "Genetikadan masala va mashqlar " Toshkent-2022 y.</p> <p>4. Fayzullaev S.S., G 'ofurov A.T. "Odam genetikasi "Toshkent-2018 y.</p>
Scope of assessment criteria and procedure	<p><b>CURRENT CONTROL</b></p> <p><b>Purpose:</b> Determining and assessing the student's level of knowledge, practical skills, and competencies on course topics.</p> <p><b>Instructions:</b> 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><b>Current control form:</b></p> <ul style="list-style-type: none"> <li>Activity in lessons</li> <li>Preparing educational materials</li> <li>Working with sources within the subject</li> <li>Using educational technologies</li> <li>Working in a team</li> <li>Preparing presentations</li> <li>Working with projects</li> </ul> <p><b>INTERMEDIATE CONTROL</b></p> <p><b>Purpose:</b> Assessing the student's knowledge and practical skills and level of mastery of lecture material after completing the relevant section of the course.</p> <p><b>Form and procedure of intermediate control:</b> 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.</p> <p><b>Independent learning:</b></p> <p><b>Purpose:</b> Independent learning is aimed at fully covering the content of this course, expanding the theoretical knowledge acquired, and establishing independent learning activities for students.</p> <p><b>Form and procedure of independent education:</b> 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.</p> <p>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.</p> <p style="padding-left: 40px;">In this case, the uniqueness of the completed assignment should not be less than 60%, otherwise the assignment will not be accepted for assessment.</p> <p style="padding-left: 40px;">The number of independent work assignments, depending on the nature of the subject, should not be less than 3 for one subject (module).</p> <p style="padding-left: 40px;">Independent work assignments account for 60% of the points allocated for current and intermediate control.</p> <p style="padding-left: 40px;">Independent learning task 1: Preparation of project work based on independent learning topics</p> <p style="padding-left: 40px;">Independent learning task 2: Preparing sample video lessons based on specialized subject topics.</p> <p style="padding-left: 40px;">Independent learning task 3: Preparation of open lesson plans in</p>

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.

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.

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.

**Final control form:** The final examination in this subject will be conducted in written form.

If the final examination is conducted in written form, the requirements for assessment must also be reflected.

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	<b>Control type</b>	<b>Total points allocated</b>	<b>Control (task) form</b>	<b>Distribution of points</b>	<b>Qualifying score</b>
	<b>Current control</b>	30 points	System tasks	20 points (divided by the number of tasks)	18 points
			Student activity (in seminars, practical, laboratory classes)	10 points	
	<b>Intermediate control</b>	20 points	Supervision: Written work	10 points	12 points
			System tasks	10 points (divided by the number of tasks)	
	<b>Final inspection</b>	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>				