

**HIGHER EDUCATION OF THE REPUBLIC OF UZBEKISTAN,  
MINISTRY OF SCIENCE AND INNOVATION**

**KOKAND STATE UNIVERSITY**

**BIOLOGICAL BASIS OF AGRICULTURE  
SCIENCE CURRICULUM**

Field of Knowledge: 500000 – Natural sciences, mathematics and statistics  
Field of Study: 510000 – Biology and related sciences  
Type of Study: 60510100 – Biology

<b>Subject/module code</b> QXBA304	<b>Academic year</b> 2025-2026	<b>Semester</b> 5	<b>Credits</b> 4	
<b>Subject/module type</b> Selection	<b>Language of instruction</b> Uzbek/Russian		<b>Weekly class hours</b> 4	
<b>1.</b>	<b>Name of science</b>	<b>Auditory training (hours)</b>	<b>Independent study (hours)</b>	<b>Total load (hour)</b>
	<b>Biological foundations of agriculture</b>	60	60	120
<b>2.</b>	<p><b>I. The content of science.</b></p> <p>The <b>purpose of teaching the subject</b> is to teach students the theoretical foundations of knowledge on global economic development, the basic concepts and categories of the global economy, economic laws and principles that apply at the global level, and to develop the skills to apply them in practice.</p> <p><b>The main tasks of science:</b></p> <ul style="list-style-type: none"> <li>– centers of origin of plants grown as crops in agriculture, based on teaching students the biological foundations of agriculture</li> <li>- to produce abundant and high-quality products in agriculture by studying morphological characteristics, biological properties, cultivation technology, and their relationship to external environmental factors.</li> </ul> <p><b>Main sources of science:</b></p> <p>The concept of agriculture, the role of agriculture in society and human life, the technologies for growing crops and storing and processing agricultural products serve as the main source.</p> <p><b>TOP-300 international leaders in science based on the university program preparedness :</b></p> <p>In plants water exchange science program of the world leader supreme education from institutions one Moscow state, which Biological foundations of agriculture of the University (Russian Federation) science based on the curriculum improved . This The university is ranked 94th in the QS World University Rankings 2024 biological foundations of agriculture field according to high qualified scientific and methodological to the base has .</p> <p>In the program following main aspects in consideration taken :</p> <p><b>Theoretical and practical approach unity</b> – Moscow state Biological foundations of agriculture of the university on the chair biological theory with one in line, practical work , village farm biological world and their mutual relations The practice is also extensive . is illuminated .</p> <p><b>International to standards compliance</b> – program international biological foundations of general agriculture laws , generally accepted done nomenclature , animals on experience transfer to the rules and other principles based on enriched .</p> <p><b>Developing critical thinking and analytical skills</b> - students learn to independently analyze situations, draw legal conclusions based on evidence, and develop their own understanding of the biological foundations of agriculture .</p>			

## **II. Main theoretical part (lectures)**

### **II.I. The subject includes the following topics:**

#### **MODULE I. Importance, morphology, biology and origin of agricultural crops.**

##### **Topic 1. The concept of the science of the biological foundations of agriculture and its tasks**

The subject "Biological Foundations of Agriculture" provides information on the role of agriculture in the life of society, that this sector is a creative one, that it provides the population with food, clothing, and raw materials for industry, livestock with nutritious fodder, and the soil with organic fertilizer, as well as its role in filling the population's tables and improving the standard of living through the development of agriculture.

##### **Topic 2. Vital factors of agricultural crops**

The need for sufficient light, heat, air, moisture, and nutrients for plant growth and development, and the law that one of the factors of life cannot be replaced by another.

##### **Topic 3: Studying weeds in agriculture and their harm**

Understanding the harm of weeds in agriculture, weed classification, weed control measures, and herbicides.

##### **Topic 4: Crop rotation and farming systems**

The role of crop rotation in agriculture, crop rotation schemes, cotton-alfalfa rotation, legume rotation, vegetable rotation, forage crop rotation. Primitive, fallow, plowed, extensive, intensive farming systems and other systems in farming.

##### **5 : Seeds and methods of planting them.**

Information about crop seeds. Main features of seed production, preparation of seeds for sowing, sowing dates, sowing schemes, sowing norms.

##### **6 : The importance of vegetables, the state of vegetable growing in Central Asia and factors for its development.**

The specifics of the climatic conditions of Central Asia, the reasons why non-irrigated vegetable growing is not feasible, research institutes established to develop melon growing in the desert zones of Central Asia, vegetable planting, selection of varieties, use of the experience of advanced vegetable growers, repeated planting, placement of vegetable crops based on their biological characteristics.

**Topic 7: Origin of vegetables and their biological properties.**

Centers of origin (homeland) of vegetables, botanical families of vegetables and agrobiological characteristics. Division of vegetables into groups according to their heat requirements. Taking into account their biological characteristics when obtaining high yields from vegetables.

**II – MODULE. Crop cultivation technologies .****8 - Topic: Understanding greenhouses and greenhouse farms . Growing vegetable seedlings in a greenhouse.**

The importance of greenhouses and hotbeds in the national economy, choosing a location for greenhouses, methods of heating greenhouses and hotbeds, and the use of biofuels.

**Topic 9: Growing vegetable seedlings and vegetables in greenhouses .**

To plant vegetables in open fields and produce an early harvest, first prepare vegetable seedlings in greenhouses, prepare seeds for planting, prepare greenhouse soil and plant seeds, and care for seedlings.

**10 - Topic: Field crops and their division into groups , general description of grain crops.**

Morphological and biological characteristics of field crops, division of field crops into groups, importance of grain crops in the national economy. Morphological structure of grain crops.

**1 1 -Topic: Growth and development of grain crops.**

The stages of development of grain crops, the role of natural conditions necessary for the passage of each stage, and their impact on productivity.

**1 2 -Topic: Importance, origin and distribution of legumes.**

The importance of legumes in the national economy, morphological and biological characteristics of botanical families.

**1 3 -Topic: Importance, origin and distribution of oil and fiber crops.**

The importance of oil and fiber crops in the national economy, morphological and biological characteristics of botanical families. Morphology, origin, distribution and biological characteristics of the cotton plant, its importance.

**Topic 14: The importance of fruit trees, their groups, morphological and biological characteristics.**

Pome fruit trees, pome fruit trees, nut, subtropical, citrus and reservoir fruits. Morphological characteristics of fruit trees. Growth and development of fruit trees, life cycles. Concept of organizing intensive gardens.

## **1 5 -Topic: The importance of reservoir fruits, their groups, morphological and biological characteristics.**

Importance, origin, distribution, cultivation technology of fruit bearing plants. Morphological and biological characteristics of fruit bearing plants.

### **III. Instructions and recommendations for practical training.**

Practical training for following topics recommendation is being done :

#### **MODULE I. Importance, morphology, biology and origin of agricultural crops.**

1. Development of a technological map for crop cultivation .
2. Development of a technological map for cotton cultivation
3. Development of crop rotation schemes.
4. Study of biological groups of weeds.
5. Getting to know the most important types of vegetable crops
6. Potato crop characteristics
7. Characteristics of tomato-related vegetables
8. Characteristics of cucumber crops
9. Characteristics of onion crops
10. Characteristics of cabbage crops
11. The importance and cultivation technology of winter wheat.
12. The importance and cultivation technology of the hemp plant.
13. Fruit and berry of fruits standard varieties .
14. Establishing a fruit orchard.
15. Pruning, shaping, taking, storing, and planting vine cuttings

### **IV . Independent learning and independent work**

**It is recommended that independent work performed outside of class time be of the following types:**

- essay - a written expression of personal opinion on a current topic in critical, journalistic, and other genres;
- preparing reports;
- writing a term paper;
- writing a synopsis;
- compiling a glossary;
- individual and group learning project;
- completing case assignments;
- creating thematic portfolios;
- information - analytical materials work with;
- work with sources;
- creating infographics;
- creating graphical models (mind maps, frames, logical graphs, etc.) ;
- creating multimedia presentations;
- preparation of methodological developments for lessons;
- preparation of extracurricular activities ;

education field of study ( specialization ) from the feature come came out without independent of affairs other of the types use possible .

### **Independent education and independent affairs**

#### **From the audience outside at the time executable independent affairs following in types done increase recommendation is being done :**

Recommended topics for independent study:

1. Theoretical foundations of field crop storage and factors affecting them.
2. Product requirements.
3. Product storage technology.
4. Basics of grain storage. Physical properties of grain heaps.
5. Basics of grain processing. Flour yield and grades. Types of milling.
6. Technology of mixed fodder production and storage. Grain cleaning.
7. Types of warehouses for storing seeds. Storage of finished products.
8. Seed production technologies
9. Root vegetables. Information about sugar beets and other root vegetables.
10. Fiber crops. General description of hemp. Cultivation of hemp crops and preparation for first production.
11. Economic valuation of lands. Land cadastre and soil assessment.
12. Soils of forest-steppe, steppe and dry steppe regions.
13. Soils of the mountainous regions of the republic.
14. Air, heat, and nutrient properties of soil.
15. The organic part of the soil. Composition and properties of humus formation.
16. Preparing the land for planting and sowing.
17. Crop rotation and its effectiveness in farming.
18. Autumn plowing, its importance, duration.
19. Propagation, harvesting, storage, and yield of tuberless potatoes.
20. Melon cultivation technology
21. Technology for growing tomatoes and cucumbers in greenhouses
22. Technology of growing vegetable crops using hydroponics.
23. Technology of growing citrus fruits in greenhouses.
24. Establishing intensive gardens
25. Gardening methods
26. Vineyard establishment methods
27. The importance and cultivation technologies of forage crops
28. The importance and cultivation characteristics of soybeans
29. safflower and sunflower plants.
30. The importance and cultivation technologies of sesame and flax plants

It is recommended that students prepare and present abstracts on topics that are being studied independently.

#### **3 V. Education results (competences to be formed)**

**The student should know:**

	<ul style="list-style-type: none"> <li>• understanding of agriculture, the role of agriculture in society and human life, and the technologies for growing crops and storing and processing agricultural products ; ( knowledge )</li> <li>• soil composition and properties, tillage, crop cultivation technologies, greenhouse vegetable and fruit growing technologies, methods of organizing intensive gardens <b><i>knowledge and ability to use them; (skill)</i></b></li> </ul> <p><b><i>has the skills</i></b> to analyze the process of agricultural crop cultivation technologies and apply them in practice, and to adopt solutions to the problems of growing crops in open and closed areas . <b><i>must be. (qualification)</i></b></p>
	<p><b>V I. Questions on the topic:</b></p> <ol style="list-style-type: none"> <li>1. Determining the total amount of weed seeds in the soil.</li> <li>2. Identifying vegetable crops by their seeds.</li> <li>3. Identify vegetable crops by their stems and first true leaves.</li> <li>4. Characteristics of green vegetables and legumes.</li> <li>5. Determination of seed quality indicators.</li> <li>6. Determining the actual sowing rate of wheat seed.</li> <li>7. Determining seedling thickness in cotton.</li> <li>8. Determining the amount of grain output in the case of S.</li> <li>9. Identify the root and leaf structure of cotton.</li> </ol>
4.	<p><b>V I I. Educational technologies and methods:</b></p> <ul style="list-style-type: none"> <li>• working in groups;</li> <li>• practical training</li> <li>• making presentations;</li> <li>• individual projects;</li> <li>• projects for teamwork and protection.</li> <li>• create creative works</li> </ul>
5.	<p><b>VIII. To receive credits, students must:</b></p> <p>Complete mastery of theoretical and methodological concepts and knowledge of the subject, the ability to correctly reflect the results of the analysis, the ability to independently observe the processes being studied, and the ability to complete tasks given in the forms of current and intermediate control, as well as tasks for final control.</p>
6 .	<p><b>IX. Main literature</b></p> <ol style="list-style-type: none"> <li>1. Idrisov XA, Nazarova SM Plant Science . Study Manual. " Durdona " Publishing House . Bukhara - 2023 .</li> <li>2. Mutalov K, Boqiyev DT, Ishm O'minov BB "Laboratory and practical classes in soil science and biological foundations of agriculture". Tashkent, 2021.</li> <li>3. Ramazonov BR, Mutalov KA Soil Science and village farm biological Fundamentals. Daslik . " Zebo Print" publishing house . Tashkent - 2022.</li> <li>4. Kho'janazarov O', Boqi ev D. "Biological foundations of agriculture". Textbook. Tashkent, 2022</li> <li>5. Kho'janazarov O'.E., Boqiyev D. Biological foundations of agriculture. Daslik. " Innovation-Ziyo " publishing house. Tashkent – 202 3 years.</li> </ol>

**X. Additional literature**

1. Artukmetov ZA, Sherali ev Kh . “Fundamentals of crop irrigation”. –T.: “Mehnat”, 2006 .
2. Ataba yeva X. “Plant Science”. – T.: “ New Generation of the Century ”, 200 6.
3. Boqiyev DT, Kho'janazarov O'. " Laboratory work and practical exercises in general farming". Tashkent, 2010.
4. Toshkhodjaev R. “Soil science (practical exercises)” – T.: “ TDPU ”, 2009.
5. Kho'janazarov O', Boqi ev D., “Laboratory exercises in cotton growing”. Tashkent, 2007.

**Information sources**

1. [http :// www.edu.uz](http://www.edu.uz)
2. <https://bio.msu.ru/study/specialty/>