Abstract of the optional educational component «**Biotechnology»**

Academic discipline	**Biotechnology**
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Courses and semesters, when the discipline is planning to study	2 courses 3 semesters
Faculties whose students are invited to study discipline	Biological-technological faculty
List of competencies and learning-related outcomes that discipline provides	According to the requirements of the educational and professional program "Technology of production and processing of animal husbandry products", applicants must acquire the ability to acquire the following competencies: ZK 2. (general competence). The ability to preserve and multiply moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle. ZK 4. Knowledge and understanding of the subject area and understanding of professional activity. ZK 8. Efforts to preserve the environment. The result of studying in the discipline is the acquisition by students of the following knowledge and skills: - ensure compliance with parameters and control technological processes for the production and processing of livestock products (be able to organize and control industrial biotechnological processes); - train employees of the enterprise in modern and new components of technological processes for the production and processing of animal husbandry products (provide parameters and carry out technological control of modern biotechnologies for the production and processing of animal husbandry products); - to organize joint activities of the work team (union of all employees who carry out joint labor activities at biotechnological enterprises); - to ensure the quality of performed works (know and be able to control the quality of biotechnological processes); - apply knowledge of reproduction and breeding of agricultural animals for effective management of the enterprise's economic activity (be able to apply the

	acquired knowledge and understanding of the subject area of the profession for the purpose of training the enterprise's employees); - apply international and national standards and practices in professional activities (know modern biotechnologies for the creation of new enzyme preparations at Ukrainian enterprises and be able to apply them in practice, know modern trends in the improvement of biotechnology for the production of modern bio-additives and feed additives in Ukraine and in the world); know the main historical stages of development of the subject area (to know the history of the formation and development of biotechnology as a science, to know the tasks and achievements of biotechnology in solving practical issues of animal husbandry)
Description of the discipline	
Preconditions necessary for the study of discipline	The optional educational component "Biotechnology" is based on the knowledge of such disciplines as: "Biochemistry in animal husbandry", "Genetics with biometrics", "Microbiology in animal husbandry" studied in previous semesters.
Maximum number of students who can study simultaneously	55 students
Lesson plans	**Lectures** 1. Introduction. The importance of biotechnology 2. Fundamentals of genetic engineering and molecular biology 3. Organic and inorganic polymer carriers. Physical and chemical methods of enzyme immobilization 4. Biotechnology of protein production 5. Industrial biotechnologies are based on the use of immobilized enzymes in animal husbandry. 6. Biotechnology of obtaining biofuel by anaerobic fermentation 7. Vermiculture biotechnology **Practical classes** 1. Safety rules when working in a biotechnological laboratory. Objects of biotechnology, basic requirements for their use 2. Adsorption of urease on zeolite and study of the activity of immobilized and free enzyme 3. Immobilization of glucoamylase and study of activity immobilized and free enzymes 4. Studying the properties of glucoamylase. Preservation enzymatic activity of different forms of enzyme under the action of denaturing factors - heavy metal ions 5. Study of the effect of the denaturing factor on the activity of the free and immobilized glucoamylase enzyme - the reaction (pH) of the environment 6. Immobilization of protosubtilin and comparison of the

	activity of free and immobilized enzyme. Study of the resistance of protosubtilin (preservation of enzymatic activity) to the action of the denaturing factor - heavy metal ions 7. Study of the influence on the activity of free and immobilized protosubtilin denaturing enzyme of the reaction factor (pH) of the environment 8. The effect of protosubtilin on the activity of free and immobilized glucoamylase enzyme 9. Study of preservation of the activity of free and immobilized glucoamylase enzyme under the complex action of heavy metal ions and an acidic environment on the enzyme 10. Study of preservation of activity of free and of the immobilized protosubtilin enzyme under the complex action of heavy metal ions and an acidic environment on the enzyme 11. Determining the amount of manure biomass for biogas production. Calculation of the influence of quality parameters of manure biomass on biogas output 12. Determination of the main parameters of the system of anaerobic fermentation of manure biomass (methane tank of BGU). Determination of the yield of commercial biogas
Teaching language	Ukrainian, English