

**162 BIOTECHNOLOGIES AND BIOENGINEERING
EDUCATIONAL-PROFESSIONAL PROGRAM AT
THE SECOND (MASTER'S) LEVEL
“INDUSTRIAL BIOTECHNOLOGY”**



Garant program - **Strilets Oksana Petrovna**
Doctor of Pharmaceutical Sciences, Professor,
Professor, Department of Biotechnology
Faculty of Pharmaceutical Technology and
Management
<https://biotech.nuph.edu.ua>
email: biotech@nuph.edu.ua

Branch of knowledge	16 Chemical and Bioengineering
Specialty	162 Biotechnology and Bioengineering
Scope of the program	90 ECTS credits
The duration of the program	1 year 6 months
Form of study	Full-time / evening / part-time

The educational and professional program "Industrial Biotechnology" is aimed at the formation and development of general and professional competencies of masters' specialists in biotechnologies and bioengineering capable of comprehensive implementation of research, design and technological, production and technological works related to the use of biological agents and products their life.

Features of the educational and professional program

The Master's Degree Program provides theoretical, practical and research training; generalization of the results of scientific research, design and technological, production and technological works, implementation and protection of qualification master's work. The educational-professional program is aimed at solving current problems in the national economy sectors related to the use of biotechnologies and bioengineering (food, agriculture, etc.), focused on the practical activities of future masters in biotechnology and bioengineering.

Program components:

No	Name of the discipline
Compulsory discipline	
1	Pedagogy and psychology of higher education
2	Economics of innovation activity
3	Newest technologies of production of biopreparations
4	GMP system and design of biotech enterprises
5	Organization and planning of the GDR

6	Molecular Biotechnology
7	Ecological monitoring in biotechnology
8	Human Resources
Elective disciplines	
9	Marketing research in biotechnology
10	Validation of the technological process
11	Methodology and logic of scientific research
12	Information technology in scientific research
13.a	Nanostructures in biotechnology
13.6	Biosafety in the bioindustry
14.a	Technology of processing of raw materials
14.6	Production of enzyme preparations
Practical training	
1	Internship
Graduates certification	
Protecting the qualification master's work	

Employment and competitive advantage of graduates of the program

Graduates of the master's program will be able to hold such primary positions under the State Classifier of professions DK 003:2010:

2149.1: Junior Researcher (bioengineering)

2149.2: Engineer-researcher, engineer for standardization and quality, laboratory engineer, technology engineer, labor protection engineer

2211.1: Junior Researcher (Biology)

2211.2: Biotechnologist

2310.2: Assistant

2320: Teacher of vocational education and training institution

2419.3: State expert

3152: Product Quality Inspector

8259: Product and Process Quality Control Controller (Chemical Production)

It is possible to continue further education at the third (educational-scientific) level (doctoral programs), as well as advanced training and obtain additional postgraduate education.

Program learning outcomes

Upon graduation from the educational-professional program, applicants of higher education will:

- be able to perform patent search and process scientific and technical information; submit an application for an invention independently;

- know national and international copyright law. Be able to protect their copyrights and avoid copyright infringement in the process of professional activity;

- conduct technical and economic calculations of the effectiveness of design and development decisions and their consequences in the short and long term;

- be able to apply methods of mathematical modeling and optimization in the development of scientific and technical projects;

- To know the molecular organization and regulation of gene expression, replication, recombination and reparation, restriction and modification of genetic material in pro- and eukaryotes, a strategy for the creation of recombinant DNA for the purposeful design of biological agents;

- to know the basic methodical methods of cultivating eukaryotic cells of animal and plant origin, as well as technologies for their application for scientific purposes, medicine, agriculture, etc .;

- be able to work with different biological agents (isolation, identification, storage, cultivation, immobilization), optimize nutrient media, be able to choose the best methods for analysis, selection and purification of the target product, using modern biotechnological methods and techniques that are specific to a certain direction of biotechnology;

- be able to formulate the purpose and tasks of research and scientific and technical activities in the field of biotechnology, based on current trends in the development of science, technology and society;

- to be able to substantiate methods and means of protection of man and the environment from dangerous factors of anthropogenic and biological origin;

- to know the general trends in the development of advanced biotechnology in advanced countries, to be able to assess the effectiveness of advanced biotechnology, to implement the most effective biotechnological methods and techniques in practical production activities;

- be able to carry out technical and economic forecasting and optimization of scientific and technical works. Identify the trends of scientific and technical development of society and the biotechnology industry;

- be able to select and substantiate raw materials, materials and intermediates according to the conditions of biotechnological production taking into account technological and other uncertainties;

- be able to compile technological and analytical documentation for biotechnological products of different purposes;

- be able to execute fragments of a marketing program and strategy, assess ways to promote biotech products to the consumer, methods for setting prices for it;

- be able to analyze the content of the foreign trade contract, assess its advantages and risks from the position of the particular enterprise and determine the appropriate measures for its implementation;

- be able to manage complex biotechnological processes.