NATIONAL TECHNICAL UNIVERSITY OF UKRAINE
“IGOR SIKORSKY KYIV POLYTECHNIC INSTITUTE”

Specialties:

162 Biotechnologies and Bioengineering

091 Biology and Biochemistry

FACULTY OF BIOTECHNOLOGY AND BIOTECHNICS

website:
biotech.kpi.ua

admission:
https://istudent.kpi.ua/en/introduction

Ukraine, Kyiv, 2024

CONTENTS

For the foreign citizens in 2024 all processes
submitting documents,
taking entrance exams,
studying during the academic year
can be carried out offline or online (distance)

1. COMMON DESCRIPTION OF THE FACULTY

The first in Ukraine **Faculty of Biotechnology and Biotechnics** (FBT) was founded in January 2001 at the Igor Sikorsky KPI.

Biotechnology is the science of obtaining required for people materials and products with the use of living cells and special equipment – biotechnics.

The Faculty provides training of highly qualified professionals for modern sectors of biotechnology: microbial synthesis of biologically active compounds, immune- biotechnology, genetic engineering biotechnology, biotechnology of pharmaceutical drugs, eco biotechnology, bioenergetics, biodegradation of wastes, obtaining a useful substance from the biomass and wastes, bio testing of pollutions, engineering support of biotechnological and pharmaceutical productions, molecular biotechnology and bioinformatics.

Graduates of the Faculty can develop and implement the latest technological processes and design equipment for biotechnological and pharmaceutical productions, monitor and protect the environment from man-made impacts competently and scientifically, and simulate biotechnological processes to determine the optimum conditions of biosynthesis, destruction of wastes, and optimization of damaged ecosystems through the widespread use of the most advanced mathematical methods and computer technology.

2. STRUCTURE

The Faculty of Biotechnology and Biotechnics consists of three departments:

- **Department of Industrial Biotechnology and Biopharmacy;**
- **Department of Biotechnics and Engineering;**
- **Department of Bioenergy, Bioinformatics and Environmental Biotechnology**

3. EDUCATIONAL PROGRAMS

Levels of higher education. Training of students at the FBT is carried out at three levels of higher education.

At the first level (Bachelor's course), the students acquire fundamental knowledge in chemistry, physics, mathematics, computer engineering, biology and special disciplines. During the fourth year, they prepare and defend the bachelor's thesis and acquire a bachelor's degree.

At the second level (Master's course) students acquire relevant professional skills including laboratory practice. Applicants prepare and defend a master's theses and acquire a master's degree.

The Master's course (professional program) is aimed at the engineering and production implementation of biotechnology and involves the design of production in the pharmaceutical and biotechnology industries. The master's thesis contains an engineering project of production one of the biotechnological or pharmaceutical products.

The Master's course (scientific program) is aimed at research work in the biotechnological direction and involves students conducting their own scientific research in the laboratories of departments or partner institutes. The master's thesis contains the results of the student's own scientific research under the guidance of the teacher and can be the basis for future scientific activity, including for further admission to PhD-program.

The third educational-scientific level – postgraduate studies. Applicants defend their dissertations and they are awarded the educational qualification of Doctor of Philosophy (PhD).

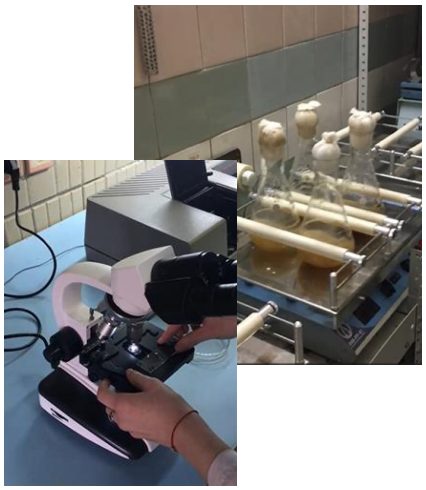
Education is conducted in full-time or part-time (extramural) and can be realize offline or online (distance)

Specialty *(Educational Program)*	Levels of higher education	Cost of education for foreign citizens **full-time/part-time**	
		Ukrainian language of training	**English** language of training
162 Biotechnologies and Bioengineering ***(Biotechnologies)***	Bachelor Master PhD	2600/2000 $/year 2800/2000 $/year 4300/2400 $/year	not provide 3000/2000 $/year 4500/2600 $/year
091 Biology and Biochemistry ***(Applied Biology)***	PhD	4300/2400 $/year	4500/2600 $/year

Terms and language of training:

Bachelor – 4 years, in Ukrainian only;
Master (professional program) – 1 year 4 months, in Ukrainian/in English;
Master (scientific program) – 1 year 9 months, in Ukrainian/in English;

PhD – 4 years, in Ukrainian/in English.



Department of Industrial Biotechnology and Biopharmacy provides scientific and engineering personnel for the biotechnological, biochemical, and chemical industries, food industries, research, and design institutions of the biological and chemical profile, sanitary inspections, firms and institutions that produce food additives and veterinary drugs, control and production laboratories, control and analysis laboratories, certification centers.

Future specialists-biotechnologists are getting three educations: chemical, engineering and biological. In addition to general scientific and engineering disciplines, students study such professional disciplines as microbiology and virology, biochemistry, genetics, cell and genetic engineering, immunology, general biotechnology, fundamentals of pharmaceutical production, fundamentals of cosmetic production, industrial enzymology, functional demonic, plant biotechnology. Graduates of the department are working at the leading pharmaceutical and biotech companies of Ukraine, certification laboratories, and biocontrol. They are developing biologically active drugs at the Institute of Microbiology and Virology, Molecular Biology and Genetics, Biochemistry, and others.

Department of Biotechnics and Engineering trains professionals who are well versed in foreign and domestic equipment of pharmaceutical and microbiological industries, and due to this:

- perform engineering for the implementation of the equipment in domestic plants and factories with subsequent maintenance and service;
- design new equipment for pharmaceutical and microbiological industries for production at domestic machine-building plants.

Graduates of the department are successfully working at the leading enterprises of Kyiv: PJSC "Darnytsia", JSC "Farmak", "Rosynka", PJSC "Biofarma", "Kyiv Winery of Sparkling Wines", PJSC SIC "Borshchahivskyi CPP.

Department of Bioenergy, Bioinformatics and Environmental Biotechnology provides training to specialists that in addition to the basic disciplines of biological, chemical, and engineering areas students study modern technologies of waste processing of different origins and specially grown biomass into the energy and useful substances that can replace existing synthetic analogs obtained with the use of natural gas and oil.

Students study the new wastewater treatment technology and the design of treatment plants and bioreactors.

Bioinformatics makes it possible to simulate biotechnological processes at the stages of development of industrial technologies and to analyze and predict the properties of new biological structures and molecules.

Graduates of the department can work in the biochemical and biotechnological production of pharmaceutical chemicals companies, in the food industry, in the research and design institutions of biological, medical, and chemical areas, diagnostic laboratories, and research centers for the creation of new drugs.

4. TRAINING AND LABORATORY BASE

The academic staff of the faculty actively use modern teaching technology during lectures, practical training, seminars, and laboratory sessions. They apply modern software products, Internet resources, modern means of presentation, and visual support of lectures in the form of films, videos, slides, etc.

The fuculty is provided with modern equipment such as a photocolorimeters KFK-2, thermostat, pH-meter, sterilizer, autoclave, bioreactors, potentiostat, biological microscopes probe scanning microscope NanoEducator, centrifuge apparatus, the chamber for horizontal electrophoresis, apparatus for determining the magnetic susceptibility of magnetically sorbents and magnetic pharmaceutical forms, apparatus for producing high-gradient ferromagnetic attachments by electrodeposition in a magnetic field and by magnetically controlled corrosion. All above-mentioned equipment is used for carrying out the educational process and in the performance of research works of students and graduate students, as well as for scientific research of the department.

5. RESEARCH ACTIVITY

Department of Industrial Biotechnology and Biopharmacy

- Biotechnology of microbial synthesis of vitamins, bacteriolytic enzymes and antibiotics.
- The use of biotechnology and biotechnology in medicine.
- Biochemistry and biotechnology of higher basidiomycetes.
- Development of technology for probiotic preparations based on lactic acid bacteria.
- Ready forms of bacteriolytic enzymes and antibiotics for medicine, agriculture, industry.
- Biotechnology of fungal carotenoids. Enzyme systems of the genus Polyporus.
- Biotechnology of polysaccharides obtained from higher basidiomycetes.

Department of Biotechnics and Engineering

- Development of membrane systems for private households.
- The vibration of flat and shell fragments under the influence of kinematic and wave spatial factors.
- Terms of occurrence of the wave coincidence and spatial-frequency resonances.
- Implementation of acoustically transparent structures.
- Remote control of heat transfer process in a bioreactor with an ultrasonic beam.
- Membrane technologies of mixtures treatment.
- Mathematical modeling techniques in biotechnology.

Department of Bioenergy, Bioinformatics and Environmental Biotechnology

- Modern technology of biological wastewater treatment;
- Development of microbial fuel cells to produce electricity and hydrogen;
- Biotechnology producing of energy carriers (methane, hydrogen, alcohols, etc.) from the organic wastes of different origins;
- Studies on the impact of physical and chemical factors on the change in microalgae metabolism to produce energy carriers, biologically active substances, and drugs;
- Development of a new magnetic dosage form for targeted drug delivery to the tumor;

- The study of self-organization processes in the system metal-electrolyte in a constant magnetic field;
- Magnetically controlled biosorption of heavy metal ions by yeasts in a constant field with the use of the system of ferromagnetic elements;
- Development of high gradient magnetic matrix and designs of magnetic separators;

6. CONTACT INFORMATION

Dean of the Faculty: Dr.Eng.Sci., Prof., Tetiana S. Todosiichuk

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