

"Biomedical engineering is an interdisciplinary field of science and engineering, which combines engineering and life Sciences. The goal of biomedical engineering is to solve problems arising in the study of living objects, with the help of engineering methods and principles."



INFORMATION PACKAGE

**FACULTY OF BIOMEDICAL
ENGINEERING**

Kyiv, 2016

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****The information is current as for 2016/2017 academic year. In the next academic year, there may be minor changes in the list of training directions, specialties, and specializations.*



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1. COMMON DESCRIPTION AND STRUCTURE OF FACULTY



The biomedical engineering industry is growing rapidly and is one of the most promising areas of engineering future. Biomedical Engineering opens new opportunities for career growth and professional development. Department of Biomedical Engineering (FBMI) - one of the youngest faculties of Igor Sikorsky KPI, arose in response to the challenge of the time.

Faculty trains specialists in the modern sections of Biomedical Engineering, Medical and Biological Informatics and Cybernetics, physical rehabilitation. Preparing students for FBMI carry about 130 highly qualified specialists of the faculty and the leading scientists of NAS and NAMS of Ukraine including 2 professors who are honored workers of science and technology of Ukraine, 15 doctors of sciences, 20 candidates of sciences. FBMI students pass an industrial practice at the leading research institutions, clinical hospitals and manufacturing plants of Ukraine and abroad. The faculty graduates work both in Ukraine and abroad, holding positions of leading specialists - with biomedical engineers, software developers and scientists.

Structure. The faculty includes 5 departments

1. Department of Biomedical Engineering trains bachelors, masters, and specialists of the highest qualification in the field of "Biomedical engineering" (specialization "Clinical engineering") and "Metrology and information-computing systems" (specialization: "Biomedical devices and information systems").



Training students on "Biomedical engineering" aimed at obtaining engineering and technical knowledge, skills and abilities to create tools and methods, improvement and research of natural and artificial biological objects, machinery, materials and medical products, technologies and technical systems for diagnostics, treatment, rehabilitation and prevention of human



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diseases, as well as software and information technologies for solving applied and fundamental problems of biology and medicine.

Training students on "Metrology and information-measuring systems" is aimed at in-depth training in the field of Metrology and information-measuring technologies, standardization, certification and quality management in the field of medicine and production of diagnostic equipment and medical products, metrological support of technical systems and research in biology and medicine.

2. Department of Biomedical Cybernetics trains professionals in "Computer science and information technologies", specialization "Information technologies in biology and medicine".



The Department trains specialists competent in the design, development and practical application of medical information systems; medical robotics and nanotechnology; medical systems for diagnostics and monitoring condition of the body; medical Cybernetics

and simulation; telemedicine.

3. Department of Biosecurity and Health prepares experts in specialties "Physical rehabilitation" and "Biomedical engineering" (specialization "Rehabilitation engineering").



Training is provided at the junction of such areas as biomedical engineering, instrumentation, and computer science. As technology and Biosafety, bioengineering and restoration are based on the application of engineering principles for the study and development of medical technology, pharmacology, nanotechnology, etc. Regenerative bioengineering applies the principles of cell transplantation, materials science, biochemistry, bio-Informatics and biomedical engineering to construct biological substitutes that restore and maintain normal function in diseased and damaged tissues.

The combined use of technologies of regenerative bioengineering and Biosafety offers new treatment methods for patients with injuries and those who require



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replacement of certain organs and tissues on an artificial as well as for patients with other clinical problems.



4. Department of Physical Education is a University-wide Department and conducts workshops and lecture courses in physical education to students of all the Igor Sikorsky KPI faculties.

The purpose of the Department includes development of new educational technologies to improve the educational process in physical education, monitoring of the functional state and health of students and teachers of Igor Sikorski KPI, upbringing of healthy and comprehensively developed experts, organizing and conducting classes in physical education, exercise and sports perfection of students of the University, preparation for competitions at various levels.

5. At the Department of Sports Improvement as a University-wide academic unit, the priorities include ensuring the educational process with the students of



Department of physical education and the section for work with students' teams of the Department of sports upbringing.

Sectional training sessions are conducted in football, basketball, volleyball, sports aerobics and fitness, athletics, swimming, wrestling, boxing and kickboxing, weightlifting, arm wrestling, archery, rowing, kayaking and canoeing, triathlon, chess, water polo. During the period of existence of the department, the teaching, and educational work has acquired a qualitatively new level, which reflects the achievements of the leading university athletes.



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2. EDUCATIONAL PROGRAMS

Levels of higher education. Training of students at the FCT is carried out at several levels of higher education. At the first level (Bachelor's, I – IV years) the students acquire fundamental knowledge in physics, mathematics, mechanics, computer engineering, and special disciplines. During the IV year, they defend bachelor course work and receive Bachelor's qualification degree. At the second level (Magistracy, V – VI years) training is carried out according to the Master program. Students are trained and acquire relevant skills including laboratory practice. Additionally, students have the opportunity to continue their education in a graduate course, and then in a doctoral candidacy of the University.

Terms of specialists training: Bachelor (b) – 4 years; Master (m) – 2 years (standard terms of training at Bachelor course and Magistracy), Graduate course / Doctoral candidacy – 3 years (4 years by the correspondence study).

Training of specialists is carried out on the full-time and correspondence forms of education.

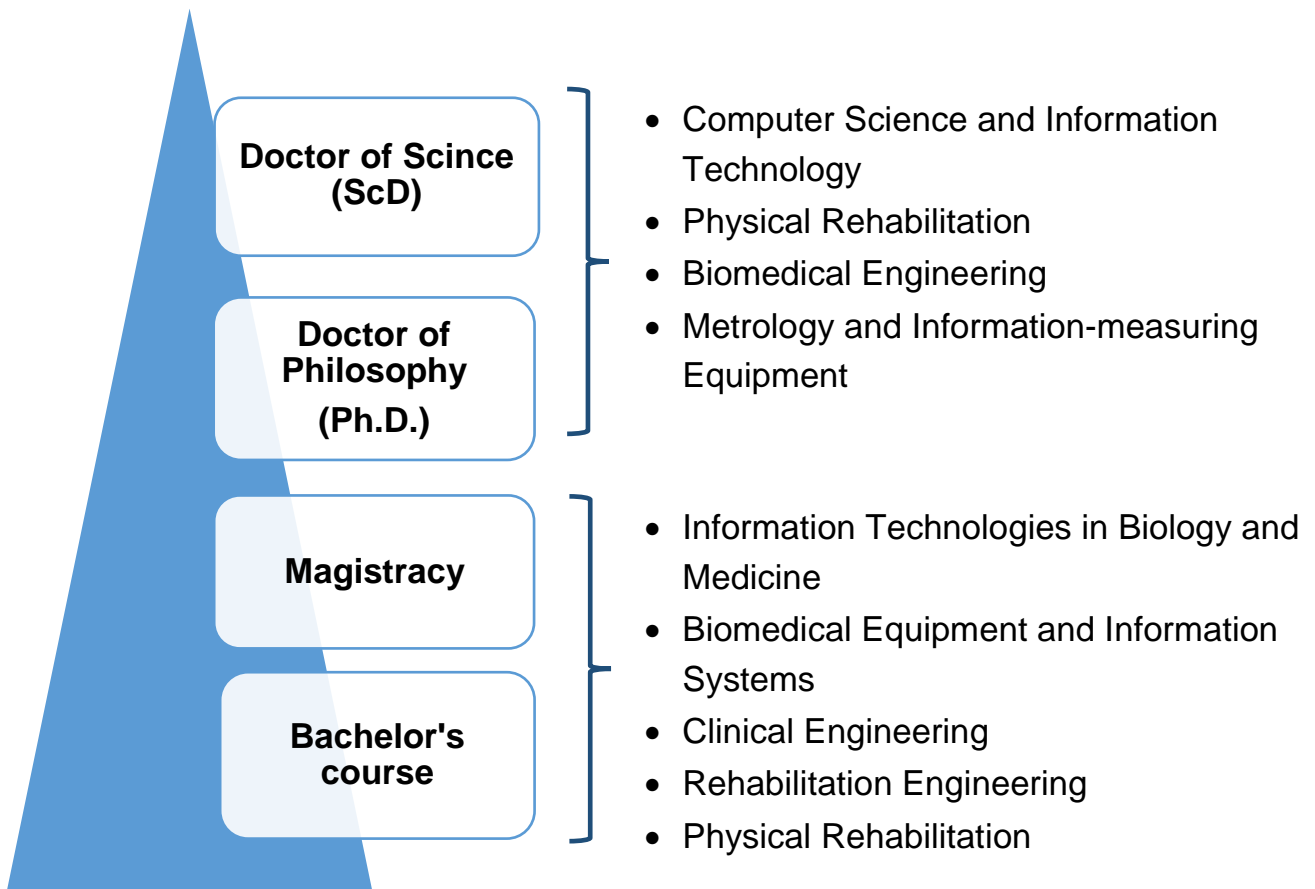


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Areas and specialties of students training at the FBE:



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3. TRAINING AND LABORATORY BASE

The faculty is equipped with modern **laboratory facilities**:

– Scientific-technical laboratory of the development of medical devices and systems. The main tasks of the laboratory are the development of software and hardware, medical devices, technology software development, development and adaptation of software, conducting research, providing conditions for mastering of practical skills.

– Lab Web design the Web technologies. Its basic functions are providing the opportunity for students to master their skills on the practical application of acquired knowledge on the subject "WEB technologies and WEB-design", conducting scientific research in computer science, biomedical engineering and life Sciences, development of information systems and web applications.

– Interdepartmental laboratory of functional reserves of the human body. Laboratory activities are aimed at practical mastering of knowledge and skills on the determination of physiological parameters of the person, health check student computer programs for determining physiological parameters of a person, conducting the study and physiotherapeutic devices and methods.

- Laboratory of medical microprocessor systems, where training stands allow to explore the development of medical devices and systems based on digital signal processors and tools of the modeling signal.

– Educational – scientific medical-engineering laboratory.

The bases of the **Department of Biomedical Engineering** are the National Institute of Cardiovascular Surgery of Amosov and modern clinical laboratories of other institutes and centers of the Ministry of Health and NAMS of Ukraine; Institute of Electric of E. A. Paton NAS of Ukraine, Institute of Molecular Biology and Genetics, National Academy of Sciences of Ukraine, Institute of Problems of Materials of Frantsevich NAS of Ukraine, Research and Training Centre of Cardiovascular Engineering Igor Sikorsky KPI, modern laboratories and production facilities.

In order of realization of complex investigations, a laboratory of "Functional diagnostics" operates at the **Department of Physical Education** which hosts the massive studies of teachers and students. The laboratory has developed means of



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individual monitoring in order to assess the dynamics of health status and the width of the regulatory range.

4. RESEARCH ACTIVITY

The main researching areas of the Faculty:

1. Biomedical Engineering
2. Biomedical Informatics
3. Life Science
4. Sport Science
5. Rehabilitation Engineering
6. Regenerative Bioengineering
7. Biosafety and Biosecurity Engineering

5. INTERNATIONAL PROJECTS AND COLLABORATION

Faculty of biomedical engineering actively develops research partnerships and participates in research projects and performs research themes financed from the state budget of Ukraine, by the order of enterprises and organizations of Ukraine, as well as companies of other countries.

► Implementation of projects financed from the state budget of Ukraine.

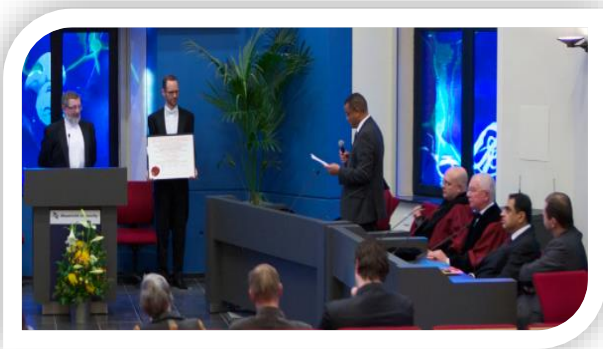
► Implementation of projects in the framework of the Ukrainian-Lithuanian cooperation Program in the field of science, education and culture.

► FBI is involved in the project of the 7th Framework Program of the European Union ("People").

► FBI participates in projects of Erasmus Mundus program, funded by the European Union.

► participation in the implementation of the joint project with the company "Samsung electronics Ukraine company".

► FBI actively cooperates with the office of the company Materialise, the office of National Instruments and others.



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6. CONTACT INFORMATION

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4. Department of Biosecurity and Health

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5. Department of Physical Education

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6. Department of Sports Improvement

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