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INFORMATION PACKAGE

FACULTY OF INFORMATICS AND COMPUTER SCIENCE

Kyiv, 2016

CONTENT

*** 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 THE STRUCTURE OF FACULTY

Informatics it is one of the most important and necessary subject matters for the

current generation of the information society to enable it to keep pace with the times, and sometimes be ahead of it. A large number of the available modern achievements of human society, as well as the unprecedented potential of its development, are based on the use of computer and software systems. Informatics and computer sciences are the means and technics that are needed in all areas of human activity. They offer significant opportunities for many spheres of life, increasing speed, improving quality and productivity, extending the geographical space.

The applicability of the knowledge areas and specialties, combined with a strong and reputable brand of the Igor Sikorsky KPI are the factors that will guarantee not only employment but also the further career of future specialist - a graduate of the **Faculty of Informatics and Computer Science (FICS)** anywhere in the world.

All the departments that form the FICS originate from the Faculty of Electrical Engineering, which was established in 1918. Faculty of Informatics and Computer Science gives have got the current name in 1985.

**Structure.** The faculty consists of 4 departments and 2 research institutes.

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1. Department of Computer Engineering trains experts in "Software Engineering" (specialization "Software for High-Performance Computer Systems and Networks"), and "Computer Engineering" (specialization "Computer Systems and Networks").

Students of specialty "Computer Engineering" obtained advanced and comprehensive knowledge in the design, development, and operation of the system and applied programming of complex computer systems: distributed and clustered computing systems, local, global, and corporate computer networks.

Activities of students of a specialty "Software Engineering" is associated with the development and maintenance of application software for computer systems and networks, corporate networks and systems, decision support systems, automated control systems, intelligent systems, business software, web-portals, multimedia software, databases and knowledgebases, software for information protection in computer systems and networks.

2. Department of Technical Cybernetics trains experts with a degree in "Automation and Computer-Integrated Technologies" (specialization "Computerized and Robotic Systems"), and "Software Engineering" (specialization "Software for Intelligent and Robotic Systems.")

The essence of graduate's activity is the development and maintenance of computerized and robotic systems, automation systems for process control, technical facilities and business systems built on the basis of information and communication networks, computer systems and microcontrollers using a systematic methodology and basic knowledge of modern information technology, computer technology, information security tools and databases and knowledgebases, management theory and decision-making, the latest programming technologies and artificial intelligence
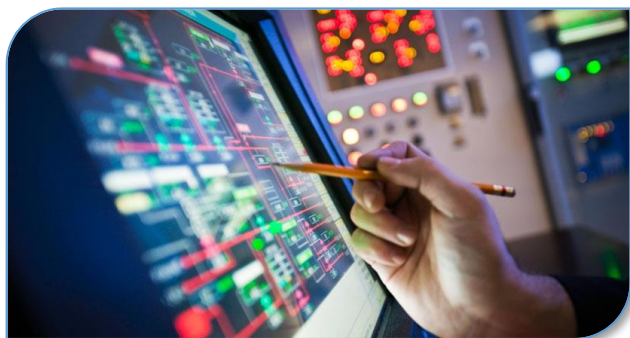
3. Department of Automation and Control in Technical Systems trains experts with a degree in "Software Engineering" (specialization Software for Information and Communication Systems"), and Automation and Computer-Integrated Technologies" (specialization "Computerized Control Systems".

The feature of graduates' training is a deep study of modern high-tech science and technology: information technology; computer, electronics, and microprocessor technology; systems and networks of data communication and telecommunications; computerized control systems. Specialist's activities are engaged in research, creation, and implementation of computerized control systems; microprocessor systems and automation; telecommunication systems and management networks.

4. Department of Computer-Aided Management and Data Processing Systems trains experts with a degree in "Computer Science and Information Technologies" (specialization "Information Control Systems and Technologies"), "Software Engineering" (specialization "Software for Information Control Systems and Technologies".)

Graduates-analysts of computer systems are characterized by high technical training, which enables them to acquire the complex knowledge of all aspects of computer engineering; system and mathematical thinking, which is a prerequisite for formalizing the system of perception and computerization; professional knowledge on software engineering, information systems, information security; broader humanitarian and economic training that allows you to freely navigate the market infrastructure.

Students have the possibility of specialization in various areas of computerization: the development, operation or marketing of computerized business process management systems; mastering the fundamentals of system technologies ORACLE,

SYBASE, INPRISE and NOVELL on the products and according to the program, provided by the manufacturers.

The activities of the **Research Institute for Systems Technology** carried out on the areas of development of intelligent technologies for automated systems, data processing, including: modeling and construction of complex systems; the creation of integrated robotic systems of production; development of software and technological resources of workstations; creation of databases and general knowledgebases; information of high school; introduction of scientific and technical developments, including the release of a small series of the developed products.

Research Institute of Information Processes engaged in development and creating the theoretical fundamentals and techniques of management systems; development of theoretical issues and the creation of means of transformation and transmission of information through communication channels; development of methods and techniques of coal quality control; development of methods and means of process control and management; development of theoretical issues and technical means of intelligent processing systems of special signals and images

2. EDUCATIONAL PROGRAMS

Levels of higher education. Training of students at the FAM is carried out at several levels of higher education. The first (Bachelor's, I-IV years) – the students acquire knowledge in physics, mathematics, mechanics, computing, informatics, and special disciplines. During the IV year, they defend bachelor course work and receive qualification degree Bachelor. At the second level (Magistracy, V - VI years) training is carried out according to the Master's 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 in Bachelor's course and Magistracy), Graduate course / Doctoral candidacy lasts 3 years (4 years by the correspondence study).

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

Areas and specialties of students training at the FICS

Doctor of Sciences

Doctor of Philosophy (Ph.D.)

- Information Technologies
- Computer Systems and Units
- Control Systems and Processes

Master's course

- Software for High-Performance Computer Systems and Networks
- Software for Information Management Systems and Technologies
- Software for Information and Communication Systems
- Software for Intelligent and Robotic Systems

Bachelor's course

- Information Management Systems and Technologies
- Computer Systems and Networks
- Computerized Control System
- Computerized and Robotic Systems

The faculty trains qualified experts in the development and operation of software and hardware of the computer and computerized systems and networks, the introduction of modern information technologies of general and designated purpose for various branches of science and industry. They are capable of creating and maintaining computer systems and computerized data processing and management of organizational and technical facilities.

Graduates work as managers and developers of hardware and software systems, project managers, managers of informational, computer and computerized systems and networks in the public and private scientific, industrial, banking institutions and firms.
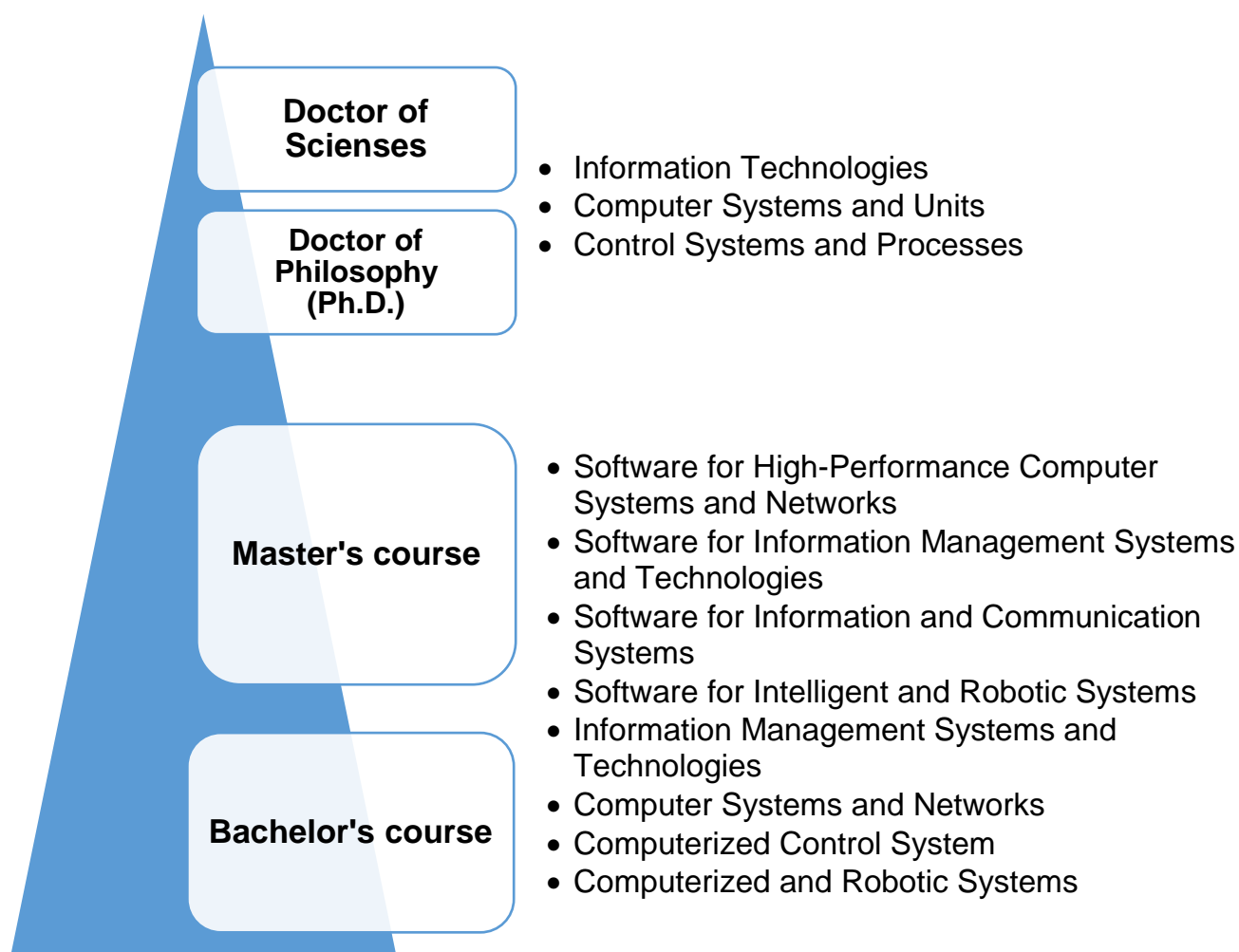
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3. TRAINING AND LABORATORY BASE

Department of Computer Engineering has a modern technical base, which consists of 7 training and 4 research laboratories, equipped with modern appliances. The department is one of the founders and developers of the concept of supercomputing center design. Personnel of the department occupy key staff positions of the center and make the main efforts to provide a high level of center efficiency and technical support.

The department of computer engineering has deployed GRID system based on middleware gLite 3.1, which is used to train students of modern IT technologies and solving complex scientific and engineering problems. Skills in GRID environment enable efficient use of computing resources of GRID-systems of Ukraine and the world.

First in Ukraine educational and scientific center, which was organized by company Hewlett-Packard (HP), operates at the department. The primary task of the center is to support Ukrainian universities in training of high-level IT professionals, and providing students with access to modern computer technology. Students receive training in HP server technologies and obtain an international certificate.

Department of Automation and Control in Technical Systems equipped with modern technics. Every student has the opportunity to work at a certain time in the laboratories (of data and telecommunication systems, computerized control and automation systems, microprocessor technology and electronics) and in the department display classes on the personal computers, integrated into local area network, allowing it to fully explore the latest achievements in the field of information technology, to work in the global computer network Internet.
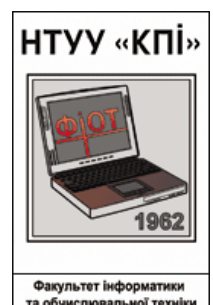
4. RESEARCH ACTIVITY

The scientific potential of the faculty is concentrated foremost in two divisions - "Research Institute of System Technologies" and "Research Institute of Information Processes." Scientists of these institutes carry out fruitful fundamental and applied research in computer science and information technology.

Scientific schools of professors Kostyuk V.I., Samofalov K., Lutskiy M., Pavlova O.A. were created and successfully functioning at the department. These schools have prepared dozens of doctors of technical sciences and hundreds of Ph.D. of technical sciences for Ukraine and abroad. The faculty actively engaged in scientific and educational work with the various institutions of National Academy of Sciences of Ukraine (NASU).

A new scientific field "Theory of network information technologies, methods and tools for hardware and software implementation of high-performance computer systems and networks focused on distributed processing of information in the cluster, GRID and Cloud environments" was formed at the *Department of Computer Engineering*.

Department of Automation and Control in Technical Systems has experience in engineering and technical developments on the orders of enterprises and organizations. Significant scientific and technical potential; well-equipped research and training laboratories; a combination of experience with the energy of young professionals makes it possible to implement a wide range of complex hardware and software systems. The specialists of the department mastered advanced equipment and production technology works.

Investigations are being carried out in the following areas:

- development of process control systems based on modern software and hardware (process controllers type P-130, KP-300, S7-200 (Siemens), Schneider et al.), robust, neural network and fuzzy control algorithms;

- development of systems for collecting, recording, storing, processing, and display information about the process of activity of divisions of communal service (boilers, water heaters, gas distribution stations, etc.), the resulting data analysis and reporting;

- development of software for monitoring and management of telecommunications systems;

- development of methods and tools for analysis and management of regional information and communications networks, computing and monitoring of telecommunications equipment in local area networks;

- development of measurement and control technics for automatic control systems for the food industry;

- development of software for enterprise management level;

- modernization of the CNC with the replacement of "Electronics-60" on an industrial PC with recovery (lost) algorithms, including systems analysis and software development based on Rational Rose;

- development and implementation of various systems, control, and management tools: a system of input, processing, data output and transmission of control commands for electric power substations;

- development of methods and means of classification and recognition;

- development a system for research of electrical and physical properties of industrial coal and determine its calorific capacitance, the quality control system of oil and petroleum products in the process of production and transportation;

- design, installation, configuration and maintenance of local, corporate and industrial networks;

- design and implementation of systems and networks for data transmission.

Department of Computer-Aided Management and Data Processing Systems is engaged in research on scientific directions:

- methods of combinatorial optimization, strategic and operational planning, decision-making;

- theory and creation of CASE technology, OLAP, and multiple tier client-server systems;

- visual simulation, generators of simulation programs and methods of simulation accelerating of stationary random processes;

- recognition methods and image analysis of situations;

- architecture and the basic elements of an integrated computerized management systems and corporate networks.

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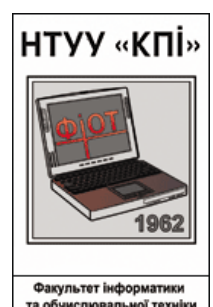
5. INTERNATIONAL PROJECTS AND COLLABORATION

Within the framework of academic mobility program, students of the faculty have the opportunity of simultaneous training at the University of Merseburg (Germany) to obtain bachelor's and master's degrees. Faculty Bachelor's program graduates can simultaneously receive master's degree at the University of Le Mans (France) in "Man and Computer" or "Real-time Architecture of Computer Systems."

Currently, specialists of the Department of Technical Cybernetics are leading performers of international program TEMPUS-TACIS INTERNET to establish a high-speed optical network in the Igor Sikorsky KPI, which integrates more than 2,000 computers based on ATM technology (V = 155 MBps), as well as NATO program of Ukrainian scientific and educational URAN network creation.

The department cooperates with KOTC AT, which is the system integrator for the creation and implementation of information technology in the public and commercial organizations, using equipment of world companies Lucent Technologies, Philips, ASCOM, Bay Networks, Compaq, TANDEM, Gateway 2000, ALR and other leading manufacturers of communication tools, computing technics, system and applied software.

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