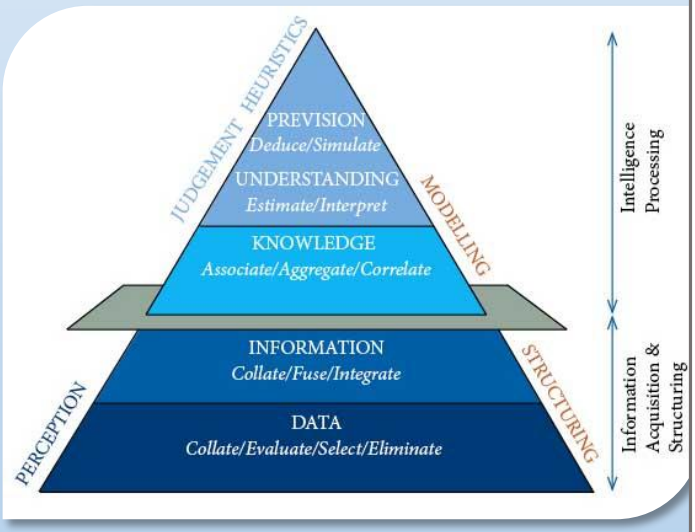
«…Institute carries out training of students on promising and relevant areas, which open up new opportunities in the labor market for young specialists-graduates...»



INFORMATION PACKAGE

INSTITUTE FOR APPLIED SYSTEM ANALYSIS

Kyiv, 2018

CONTENT

*** *Information is current as for 2018/2019 academic year. In the next academic year, there may be minor changes in the list of training specialties and specializations.*

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1. COMMON DESCRIPTION AND THE STRUCTURE OF FACULTY

It is well known the leading role of information and computer-oriented scientific and production technology for the development of a modern society, based on a combination of human intelligence, computer data processing, and their transmission through a computer network. That is why the Educational-Scientific Complex **Institute for Applied Systems Analysis (IASA)** carries out training of students on promising and relevant areas, which open up new opportunities in the labor market for young specialists-graduates.

Institute for Applied Systems Analysis functions for over 10 years. IASA has more than 25 in force agreements on cooperation with leading world universities and international organizations (EDNES, UNDP, WIPO, UICEE, IGIP, CODATA, ICSU, etc.). Institute fulfills a leading role in a number of international projects and initiatives of the highest international level (UN, UNESCO, UNIDO, and others).

Structure

Educational-Scientific Complex IASA consists of 2 departments, 4 faculties, 4 scientific divisions of the National Academy of Sciences of Ukraine, and Scientific Research Laboratory

1. Department of Mathematical Methods of System Analysis prepares highly qualified bachelors and masters in the branch of knowledge “Information Technology” in specialties "Computer Sciences" (specialization "Systems and Methods of Artificial Intelligence" and "System Analysis" (specializations "System Analysis and Management" and "Systems Analysis of Financial Market").

The department trains specialists in the areas of system analysis and intelligent decision-making systems, which are capable of designing, building and maintain computer systems for analysis, forecasting, control and design of dynamic processes in the macroeconomic, technical, technological, environmental and financial objects.

2. Department of System Design prepares highly qualified bachelors and masters in the branch of knowledge “Information Technology” in the specialty "Computer Science" (specialization "Intellectual service-oriented distributed computations").

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The department provides training for scientific, research, design, management and organizational activities in the field of application of modern information technologies in the design of a variety of objects of the artificial human environment and informational support of the functioning of organizations and institutions.

Faculty of Second Higher and Post-Diploma Education was established in 2001 with the aim of providing opportunities to individuals who already have a university degree, get another degree in a new specialty, which has a significant demand in the labor market. Learning cycle is two years. Upon completion of training professionals obtained a master's computer sciences degree of the Igor Sikorsky KPI in "Computer Science" (specialization "Systems and Methods of Artificial Intelligence" and "Systems Design of Services") and "System Analysis" (specialization "Systems Analysis of Financial Market").

On the completion of training, students are issued a certificate and integral index of knowledge quality is determined

Faculty of Pre-University Training is a subdivision of the Institute, whose task is the professional orientation of pupils, in order to identify skills, evidence-based recommendations on the choice of their future profession, and preparation for participation in the entrance examinations.

Department conducts qualitative selection and fundamental training of young people for entry in the IASA, as well as in other institutions and faculties of the Igor Sikorsky KPI. That is why leading experts of IASA, the Igor Sikorsky KPI and other educational institutions among which are professors, doctors of science, associate professors, candidates of science, experienced teachers are involved in the work of the faculty.

The curriculum provides both a classroom training and knowledge test with the help of rating activities (individual certification work on specific areas of mathematics, physics, and the planned certification tests).

Faculty of Course Training trains students of IASA and other institutes and faculties of the Igor Sikorsky KPI, as well as pupils, listeners with secondary, vocational and higher education who wish to gain in-depth knowledge on specific course programs that oriented to the knowledge of foreign languages, business etiquette, beautiful manners and professional qualities.

The faculty offers the study of foreign languages according to the effective programs that are designed by the Methodical Council, and contain scientific results of faculty members, the best achievements of Ukrainian and international practice. The training provides modern literature of Great Britain, USA, and Germany. The faculty

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has also a video room for a demonstration of video courses and movies from English-speaking countries.

Science Subdivision of Mathematical Methods of System Analysis conducts basic and applied research in the field of system analysis as an applied scientific methodology, designed for the study of complex, interdisciplinary problems of various nature.

Methodology and applied technologies of the information society and society based on knowledge are developed

Methodological and theoretical fundamentals of formalization and solving of interdisciplinary problems relating to various topical areas are formulated on a systemic approach. The methods are developed for the formalization of system tasks, their converting into a soluble form in the real world, which is characterized by the presence of many conflicting objectives, various types of uncertainties and risks.

Computational algorithms and procedures are created for solving the interdisciplinary practical problems for a number of applications that are relevant to scientific, technical and socio-economic spheres of human activity.

Science Subdivision of Applied Nonlinear Analysis conducts research on the theory of decision making under uncertainty conditions, the theory of infinitely measurable dynamical systems, methods of estimation and control of nonlinear systems with distributed parameters, nonlinear limit problems for partial differential equations and variational irregularities in the partial derivatives, which controlled by Markoff processes, bifurcation multicomponent fuels combustion mechanisms; simulative and phenomenological models of the dynamics of social processes.

Scientific Subdivision of System Mathematics was created on the base of **Scientific Subdivision of Numerical Methods of Optimization** and **Research Laboratory of Nonlinear Analysis of Differential-Operator Systems.** Subdivision carries out fundamental and applied research in the following directions:

- non-linear analysis and management of classes of non-linear geophysical processes and fields;
- properties of solutions of differential-operator inclusions and multivariate inequalities for problems of the Earth data analysis;
- theory of global and trajectory attractors of infinite-dimensional dynamical systems;
- numerical methods of nonlinear analysis and optimization;
- theory of optimal control and differential games;
- convex analysis and multiple reflections;

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- modeling of social and economic processes;
- applied problems of flow calculation in the networks.

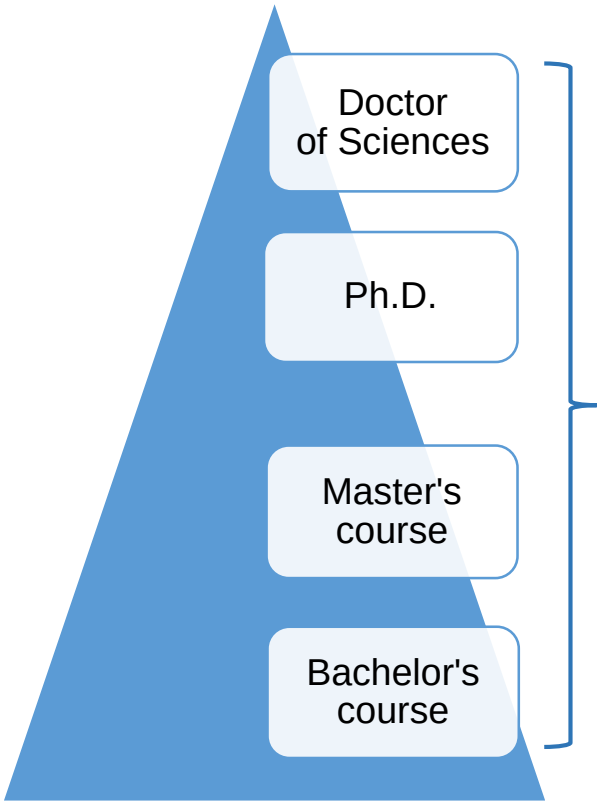
Scientific Information Resources Subdivision conducts basic and applied research in the mathematical provision of computer-aided design, namely the methods of automatic creation of mathematical models of the objects in the form of algebraic-differential equations or equations of state for description of their structure and components; in the implicit numerical methods of integration, which order is automatically changed from 1st to 6th during the computations of the received "hard" equations of mathematical models, ensuring the convergence of solutions and a predetermined error; methods for solving ill-conditioned linearized very large dimension problems, and so on.

2. EDUCATIONAL PROGRAMS

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

Specialties and specializations of the specialists' training at the IASA:



Computer Science

- Systems and Methods of Artificial Intelligence
- Intellectual Service-oriented Distributed Calculations

System Analysis

- System Analysis and Management
- System Analysis of Financial Market

Educational and Scientific Complex IASA trains specialists in information technology, systems analysis, and intelligent decision-making systems. IASA graduates are capable of designing, building and maintain computer systems for analysis, forecasting, prediction and dynamic process control in the macroeconomic, technical, physical, environmental and financial complex systems.

Graduates of the IASA are working on the positions of systems analysts, managers of information systems development, project managers, engineers of computer systems and networks in public and commercial (and production) institutions, banks and stock exchanges both in Ukraine and abroad.

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3. TRAINING AND LABORATORY BASE

IASA is fully provided with facilities for training. The following laboratories operate at the IASA:

- Teaching and Research Laboratory of Distributed Computing Samsung-KPI
- Regional Network Academy CISCO IASA Igor Sikorsky KPI
- Sap University Alliance Program
- SAS Global Academic Program
- Educational Research Laboratory for IC Design «Melexis-KPI"
- Study and Research Laboratory IASA - EPAM Systems
- IASA Laboratory of Digital Signal Processing

All the laboratories are equipped according to modern principles of computer labs. The best conditions are provided for practical training, in particular for training courses CISCO Networking Academy for design, construction and administration of local and global networks, a number of areas related to the analytical support of banking activities and other.

4. RESEARCH ACTIVITY

The main directions of scientific work of the Educational-Scientific Complex "Institute for Applied Systems Analysis" of the Igor Sikorsky KPI (subordinate to the Ministry of Education and Science of Ukraine and the National Academy of Sciences of Ukraine are:

Direction №1: Development of the methodology of the system analysis, methods, and means of the system mathematics for solving of large-scale interdisciplinary tasks in various fields of national economy

Direction №2: Development of the theory of nonlinear and multidigit analysis, nonlinear differential operator equations, and variational inclusions inequations, infinite-dimensional analysis methods, theories and methods of optimization, game theory, systems of mathematics

Direction №3: Development of theoretical and applied foundations of global modeling of continuous development processes and evaluation of aggregate principal threats to the safety and quality of life within the framework of the World Data Center "Geoinformatics and Sustainable Development" and the international cooperation of the World's Data System.

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Direction №4: Development of theory and instrumental tools of service-oriented computations for creation and maintenance of applied support by composition and control of certain services, development and implementation of the service-oriented interdisciplinary platform of engineering collaborative design in grid/cloud environment.

Department of Systems Design

The research work at the Department of Systems Design holds an academic staff, graduate students, as well as members of the research subdivision. Performers of research projects subordinate to the Information Resources Subdivision of IASA.

Direction: Computerization of design and creation of distributed software and hardware systems for designing and creation of multimedia information resources for the design and learning processes.

The main scientific problem to be solved in the course of scientific research:

- the latest methods of mathematical modeling of technical and socio-economic facilities, optimization of their parameters and characteristics;
- the collective design of Internet information environment;
- the methodology of the organization of software and hardware complexes of computer design;
- use of multimedia and Web technologies for the realization of a collective network design and learning;
- computer-aided design of integrated circuits.

Department of Mathematical Methods of System Analysis

Research and training are carried out in the frameworks of 3 scientific schools of the department. Creative achievements of scientific schools are reflected in scientific innovation and scientific and methodological activities, preparation of highly qualified scientific personnel.

Scientific schools of the department MMSA:

- System analysis and decision-making theory
- Methods and systems of computational intelligence
- Methods of processing and mining of great volumes of data of various nature in the management of projects for sustainable development.

The main directions of scientific activity:

- development of principles and methods of system analysis;

- applied research in the field of system analysis;
- analysis and design of complex information systems;
- forecasting of public issues;
- systemic research in the field of global change;
- implementation of large-scale international relations in the sphere of education and science.

5. INTERNATIONAL PROJECTS AND COLLABORATION

Educational and Scientific Complex "Institute for Applied System Analysis" collaborates on the terms and conditions of the signed agreements and contracts with the following universities:

- UNESCO International Centre for Engineering Education (UICEE) (Melbourne, Australia)
- Austro-Ukrainian Institute of Science and Technology (Vienna, Austria)
- The Vienna University of Technology (Vienna, Austria)
- Bristol University (Bristol, England)
- Liège Institute of Mathematics (Liege, Belgium)
- Budapest University of Technology and Economics (Budapest, Hungary)
- Otto von Guericke University Magdeburg (Magdeburg, Germany)
- Fraunhofer Institute for Integrated Circuits IIS (Dresden, Germany)
- Institute for Semiconductor Physics (Frankfurt an der Oder, Germany)
- Technical University of Berlin (Germany)
- Institute of Bioinformatics and Systems Biology (Munich, Germany)
- University of Indianapolis (Athens, Greece)
- Akaki Tsereteli State University (Kutaisi, Georgia)
- Technical University of Denmark (Lyngby, Denmark)
- University of Dublin (Dublin, Ireland)
- University of Alicante (Alicante, Spain)
- University of Barcelona (Barcelona, Spain)
- University of Valencia (Valencia, Spain)
- University CEU Cardenal Herrera (Elche, Spain)
- University of Murcia (Murcia, Spain)
- University of Seville (Seville, Spain)
- Polytechnic Institute of Turin (Turin, Italy)
- University of Trento (Trento, Italy)
- University of Naples Federico II (Naples, Italy))
- University of Salerno (Salerno, Italy))
- Sapienza University of Rome, (Rome, Italy))
- Chinese University of Hong Kong (Hong Kong, China)

- Central South University (Changsha, China)
- Eindhoven University of Technology (Eindhoven, Netherlands)
- Wrocław University of Technology (Wroclaw, Poland)
- Lodz University of Technology (Lodz, Poland)
- University of Mining and Metallurgy (Krakow, Poland)
- AGH University of Science and Technology (Krakow, Poland)
- Institute for Systems Analysis, RAS (Russia)
- Bauman Moscow State Technical University (Moscow, Russia)
- Taganrog State University (Taganrog, Russia)
- University of California (Berkeley, USA)
- University of California (Santa Barbara, USA)
- Michigan State University (Lansing, USA)
- University of Michigan (Ann Arbor, USA)
- University of California (Irvine, USA)
- Tampere University of Technology (Tampere, Finland)
- University of Helsinki (Helsinki, Finland)
- Ecole Polytechnique (Paris, France)
- Collège International de Cannes (Cannes, France)
- Institute of Space and Telecommunications Law (Paris, France)
- Joseph Fourier University (Grenoble, France)
- Paris Institute of Technology (Paris, France)
- Czech Technical University (Prague, Czech Republic)
- CERN (Geneva, Switzerland)
- Tallinn University of Technology (Tallinn, Estonia)
- Pohang University of Science and Technology (Pohang, South Korea)
- Korea Institute of Science and Technology (Seoul, South Korea)

Teachers and students of the IASA are cooperating with many international organizations, domestic and foreign companies in the field of education and research (Innovation for High Performance, Intel company, Central-East European Institute for Sustainable Development, Council for Science Technology of Ukraine, the British organization EUROPRACTICE)

World Data Center of Geoinformatics and Sustainable Development was established in 2006 as a branch of the World Data Centers of Solar-Terrestrial Physics and Solid Earth Data

Double degree programs are carried out by the Institute in cooperation with leading educational institutions in France, Korea, Greece, which increase the mobility of students of the Institute.

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