The Ministry of Education and Science of Ukraine
State University of Trade and Economics
Postgraduate and Doctoral Studies Department

Academic Degree	**«Doctor of Philosophy»**
Field of Study	**12 «Information Technology»**
Subject Area	**124 «System Analysis»**

INFORMATION PACKAGE (ECTS)

Educational and Scientific Programme «INFORMATION TECHNOLOGY AND BUSINESS ANALYTICS (DATA SCIENCE)»
Academic Degree «Doctor of Philosophy»

Kyiv 2024

1. General information about the University

1.1. Name and address
State University of Trade and Economics: (SUTE)
Address: Ukraine, 02156, Kyiv, 19, Kyoto str.
Phone: (044) 531 31 73, (044) 531 47 41
E-mail: knute@knute.edu.ua
Official website: www.knute.edu.ua
Official pages of SUTE in social networks:
Facebook: https://www.facebook.com/knteuofficial/
Instagram: https://www.instagram.com/knute_official/
Telegram: https://t.me/knteu
YouTube: https://www.youtube.com/user/kyotostreet

1.2. Description of the institution (in particular, type and status)
State University of Trade and Economics (SUTE) for its history has come a long way of formation and development and is currently recognized by society and the international community as a producer of highly intelligent resources, a powerful innovative educational and scientific complex with modern material and technical base, educational technologies, global information networks.

1946	Створено Київський філіал Всесоюзного заочного інституту радянської торгівлі
1959	Філіал передано у підпорядкування Харківському інституту радянської торгівлі, пізніше – Донецькому інституту радянської торгівлі
1966	Створено Київський торгово-економічний інститут
1994	Створено Київський державний торговельно-економічний університет
2000	За вагомий внесок у розвиток вищої освіти і науки України, враховуючи загальнодержавне та міжнародне визнання, університету надано статус національного
2006	Київський національний торговельно-економічний університет приєднався до Великої хартії університетів
2022	Створено Державний торговельно-економічний університет (ДТЕУ) як правонаступник Київського національного торговельно-економічного університету КНТЕУ

1946 - Kyiv branch of All-Union Correspondence Institute of Soviet Trade was established

1959 - Kyiv branch was transferred to subordination of Kharkiv Institute of Soviet Trade, later – to Donetsk Institute of Soviet Trade

1966 - Kyiv Trade and Economic Institute was established

1994 - Kyiv State University of Trade and Economics was established

2000 - Given the national and international recognition, the University was granted the status of "National" for a significant contribution to the development of higher education and science of Ukraine

2006 - Kyiv National University of Trade and Economics joined the Grand Charter of Universities

2021 - The University celebrated its 75th Anniversary at the state level

2022 - State University of Trade and Economics (SUTE) was established as the legal successor of KNUTE

Management of the University is based on the principles of autonomy and self-government, democratization of decision-making. The quality management system of SUTE is certified by international standards.

SUTE is the flagship of education and science, a leader in high quality training. A significant contribution to the formation of the younger generation belongs to a powerful scientific and pedagogical team - experienced educators, prominent scientists, public figures, effective practitioners, stakeholders.

The University introduces European approaches to training a new generation of the nation's intellectual elite. International cooperation with foreign partners, leading universities, educational and research centers of the world opens new opportunities for students. In the coming decades of global challenges to humanity, SUTE graduates will become in-demand participants in finding effective solutions, solving national, European and global problems.

Strong human resources, involvement of practitioners in the educational process and constant updating of the content of education are the basis for a high level of training.

The educational process is aimed at meeting the needs of the labor market, the formation of students' competitive advantages, innovative competencies.

A modern library complex with an electronic reader service, access to full-text electronic resources of international databases is created.

SUTE has 3 educational institutes, 8 colleges and 2 higher commercial schools located in Kyiv, Kharkiv, Vinnytsia, Chernivtsi, Khmelnytsky, Uzhhorod, Kolomyia, Burshtyn, Zhytomyr and Odesa.

There are **6 faculties** in the basic institution of SUTE: Faculty of International Trade and Law; Faculty of Economics, Management and Psychology; Faculty of Finance and Accounting; Faculty of Information

Technology; Faculty of Technologies and Business; Faculty of Trade and Marketing.

About 17,000 students study here for 74 Bachelor's (of which 4 are taught in English) and 70 Master's (of which 13 are taught in English) educational professional programmes.

SUTE carries out the training, retraining and advanced training of specialists in foreign and domestic trade, international economic relations, public management and administration, finance and banking, insurance, entrepreneurship, trading and exchange activities, accounting and taxation, financial control and audit, management, marketing, journalism, law, international law, tourism, hotel and restaurant business, food technology, psychology, philology, sociology and IT industry: cybersecurity, software engineering, computer science and system analysis.

The university has a powerful team of highly qualified lecturers and scientists, capable of successfully performing the assigned tasks. Among them are honored figures of science and technology, honored employees of higher education, academicians and corresponding members of national and branch academies of sciences.

More than 250 postgraduate students go to the Postgraduate School of the State University of Trade and Economics, established in 1966. Training is carried out in 16 specialties in postgraduate studies and 11 specialties in doctoral studies. The language of instruction is Ukrainian and English.

After thesis defence, the vast majority of graduates remain to work at the University and are involved in the formation and implementation of policies to improve the quality of activities.

To ensure a high level of training of students as well as postgraduate and doctoral students, the following SUTE centers function: The Institute of Higher Qualification (IHQ), Distance learning system, Career Development Center, Center for Technology Transfer, Center of Pedagogical and Psychological Studies, Training and Methodical Department, Academic Office, Business Incubator, Training and Research Center for Business Simulation. On the basis of the university, a legal clinic "Center for Legal Protection" was established, as well as an educational and advisory center for mediation, which provides assistance to university students and other persons in settling disputes by organizing and conducting mediation procedures. The Institute of Higher Qualification (IHQ) ensures the implementation of the concept of lifelong education, professional development, provides educational services of an international level for the training of highly qualified specialists who are able to work in today's economic conditions and successfully compete both on the domestic and international labor markets (MBA programs, second higher education, retraining and professional development).

Creative scientific teams of the university are fruitfully working on solving current scientific problems, the results of research are published in scientific journals "Scientia Fructuosa", "Foreign Trade: Economy, Finance, Law", international scientific and practical journal "Commodities and Markets".

The share of doctors of science in 2023 was 19% of the total number of scientific and pedagogical workers, candidates of sciences – 61%, that is, the share of workers with a scientific degree was 80%.

Experts of SUTE are actively involved in developing strategic directions of quality education assurance, they take part in a number of commissions of the Ministry of Education and Science of Ukraine as well as other ministries and departments.

One of the significant advantages of SUTE is the developed material and technical base of the European level for study, living, personal development.

Modernized educational buildings, classrooms are equipped with modern demonstration equipment, and laboratories – with the necessary equipment; Numerous multifunctional open-space and co-working areas, sports grounds, football field, tennis courts, rehearsal halls, numerous restaurants and a comfortable University campus provide all the conditions for study, leisure and comfortable living.

Educational institution provides free legal and psychological assistance; there are many scientific groups and professional clubs.

State University of Trade and Economics concluded numerous agreements on cooperation with ministries, departments, organizations and enterprises, in particular with the Ministry of Economy of Ukraine, the Ministry of Finance of Ukraine, the Ministry of Foreign Affairs of Ukraine, the State Fiscal Service of Ukraine, the State Treasury Service of Ukraine, the Antimonopoly Committee of Ukraine, the State Audit Service of Ukraine, the Pension Fund of Ukraine, The Accounting Chamber of Ukraine, the National Bank of Ukraine, leading commercial banks, trade, hotel and restaurant chains, advertising agencies, logistics and distribution centers and other organizations and institutions.

Creative contacts are established and maintained with more than 100 institutions of higher education, international centers and institutions from 30 countries of the world. An exchange of teachers and students is carried out, the improvement of educational programmes at different levels of training and retraining of specialists as well as international projects on the integration of higher education are implemented, students undertake an internship in 10 foreign countries.

The university is a member of the prestigious international organizations: the European Public Law Center (EPLC), the Grand Charter of

Universities, the Magna Charta of the European Universities, the Francophone University Agency (AUF), the International Association for Commodity Science and Technology, the International Culinary Union, the European Retail Academy, the World Leisure Organization.

There are well-known public figures, heads of state and government authorities, organizations and businesses, diplomatic officials and scientists, entrepreneurs among the graduates of the university.

1.3. University Administration

Anatolii MAZARAKI	Rector, Doctor of Sciences in Economics, Professor, Academician of the National Academy of Pedagogical Sciences of Ukraine, Honored Scientist of Ukraine in the field of Science and Technology, Laureate of the State Award of Ukraine in Science and Technology, Laureate of the Prize of the Cabinet of Ministers of Ukraine for the Development and Implementation of Innovative Technologies
Nataliia PRYTULSKA	First Vice-Rector for Scientific and Pedagogical Work, Doctor of Technical Sciences, Professor, Laureate of the Prize of the Cabinet of Ministers of Ukraine for the Development and Implementation of Innovative Technologies
Anzhelika GERASYMENKO	Vice-Rector for Research, Pedagogical Activities and International Relations, Doctor of Sciences in Economics, Professor
Oleksii KULIKOV	Vice-Rector for Scientific and Pedagogical Work, Administrative and Economic Activities, PhD in Law

1.4. Educational and Scientific Programme

The educational and scientific program at the third (educational and scientific) level of higher education is a single complex of educational (learning courses, individual tasks, practices, control measures, etc.) and scientific (conducting scientific research, writing scientific publications, speaking at conferences, etc.) components directed to achieve the results of training, thesis preparation and its public defense provided by such a programme, which gives the right to obtain a specified qualification.

The applicant must master the educational and scientific programme, acquire theoretical knowledge, abilities, skills and competences defined by the standard of higher education of the third (educational and scientific) level in the relevant subject area, conduct his/her own scientific research, designed in the form of a thesis, and publish its main scientific results.

Field of Study Code & Title	Subject Area
03 Humanities	033 Philosophy
05 Social and Behavioural Sciences	051 Economics
	052 Political Science
	053 Psychology
07 Management and Administration	071 Accounting and Taxation
	072 Finance, Banking, Insurance and Stock Market
	073 Management
	075 Marketing
	076 Entrepreneurship, Trade and Exchange Activities
08 Law	081 Law
12 Information Technology	122 Computer Science
	124 System Analysis
18 Production and Technology	181 Food Technology
28 Public Management and Administration	281 Public Management and Administration
29 International Relations	292 International Economic Relations
	293 International Law

Publication of thesis results is carried out in accordance with the requirements of the Ministry of Education and Science of Ukraine.

Research thesis results must be covered in at least three scientific publications of the applicant, which include:

1) research papers in scientific publications included in the list of scientific professional publications of Ukraine on the date of publication. If the number of co-authors in such research paper (together with the applicant) is more than two people, it is equivalent to 0.5 publications (except for publications specified in subparagraph 2 of this paragraph);

2) research papers in periodicals published in the Web of Science Core Collection and / or Scopus databases (except for publications of the state recognized by the Verkhovna Rada of Ukraine as the aggressor state);

3) not more than one patent for an invention that has passed the qualification examination and directly relates to the scientific results of the dissertation, which is equivalent to one scientific publication;

4) individual monographs recommended for publication by academic councils of institutions and reviewed, except for individual monographs published in a state recognized by the Verkhovna Rada of Ukraine as an aggressor state. Individual sections in collective monographs are equated to individual monographs under the same conditions. Regulations on the procedure for the implementation of the academic mobility right at SUTE.

Research paper in the edition referred to the first - third quartiles (Q1 – Q3) according to the SCImago Journal and Country Rank or Journal Citation Reports classification, or a single monograph that meets these requirements is equivalent to two scientific publications.

Belonging of the scientific publication to the first - third quartiles (Q1 – Q3) according to the SCImago Journal and Country Rank or Journal Citation Reports classification is determined according to the rating in the year in which the relevant publication was published or if the rating for the year is not published on the date of the one-time council published rating.

Research papers are credited on the topic of the thesis provided that the obtained scientific results are substantiated in accordance with the purpose of the paper (task) and conclusions, as well as the publication of not more than one research paper in one issue of a scientific publication.

Research papers published after the entry into force of the "Procedure for awarding the "Doctor of Philosophy" degree and revocation of the decision of the one-time specialized scientific council of higher education, scientific institution on awarding the "Doctor of Philosophy" degree, approved by the Cabinet of Ministers of Ukraine from January 12, 2022 № 44 only if they have an active DOI (Digital Object Identifier), except for publications that contain information classified as a state secret one or information for official use.

1.5. Admission requirements

Information about Entrance Tests and conditions for enrolling higher education applicants of the "Doctor of Philosophy" and "Doctor of Science" degrees is posted on the website of the State University of Trade and Economics.
https://knute.edu.ua/blog/read?n=Viddil%20aspiranturi%20i%20doktoranturi&uk

1.6. ECTS credit distribution policy (institutional credit framework)

The European Credit Transfer and Accumulation System (ECTS) is a system created to ensure a unified interstate procedure for measuring and comparing educational results of students of higher education between educational institutions. The system is designed for the mobility of students and teachers, it simplifies the comparison and recognition of educational

programs and academic achievements of students both between domestic and foreign educational institutions.

ECTS Credit is a unit measuring the volume of academic workload of higher education applicant required to achieve specific (expected) learning outcomes. One ECTS credit equals to 30 hours.

ECTS credit distribution is based on the official duration of the study programme cycle and is determined by the curriculum. Credits are allocated to all courses studied by the student, practical training, completion of final qualification papers (projects), certification. Credits are assigned after the completion of the course study, subject to successful result of the final control, passing of practical training and certification.

1.7. Mechanisms of academic management

Mechanisms of academic management at the University are defined in:
- Statute of SUTE;
- SUTE internal code of conduct;
- Regulations on the procedure for the preparation of Doctors of Philosophy;
- Regulations on the procedure for the preparation of Doctors of Science;
- Provision on the development and implementation of educational and scientific programs of the third level of higher education;
- SUTE Regulations on the organization of the educational process of the "Doctor of Philosophy" degree holders;
- Regulations on the certification of PhD candidates at SUTE;
- Provision on the procedure for implementing the right to academic mobility at SUTE;
- Regulations on the assessment of learning outcomes of students and postgraduate students;
- Regulations on independent work of students and postgraduate students of SUTE;
- Provision on the procedure for recognizing learning results obtained in non-formal and informal education;
- Provision on appealing the results of the final knowledge control of higher education students of SUTE;
- Provision on the candidate pool for postgraduate and doctoral studies at SUTE;
- Regulation on the observance of academic integrity by the pedagogical, academic, scientific workers and students of SUTE;
- Concept of the internal quality assurance of candidates for higher education degree "Doctor of Philosophy";
- Procedure for awarding the "Doctor of Philosophy" degree of and annulment of the decision of the one-time specialized academic council of

the institution of higher education, scientific institution on awarding the "Doctor of Philosophy" degree;
– Code of Ethics for a higher education candidate of SUTE;
– Regulation "On the scientific society of students, postgraduates and young scientists of SUTE";
– Guidebook of a PhD candidate.

2. Resources and facilities

2.1. Accommodation/housing conditions

On the territory of the campus there is an apartment-type dormitory for postgraduate students, situated 5-minute walk from the main academic building and a 15-minute walk from the metro stations «Lisova» and «Chernihivska». The city center (Khreschatyk St.) can be reached in 30 minutes. There's a forest park zone and Kyoto Park near the university.

Postgraduate students from other cities are accommodated in the dormitory if there are free places on the basis of submission by the Department of Postgraduate and Doctoral Studies by order of the Rector. A contract for the right to live in a dormitory is concluded between the university and the postgraduate student, which establishes the rights and obligations, as well as the mutual responsibility of the parties for their observance and fulfillment.

Dormitory address: № 5 – 6-A Miliutenko st., Kyiv, 02156;
tel. (044) 518-92-63, (044) 518-92-94

2.2. Catering

The university has modern canteens in buildings A, B, D, E and M (57 D. Doroshenko St.), where there is an opportunity to eat quality, balanced food at moderate prices, in particular, "Venice" cafeteria (building B) presents dishes of Italian cuisine.

Cafes are open every day in all educational buildings, where you can also taste own-produced dishes: main dishes (more than 15 types), side dishes (more than 10 types), cold dishes (more than 12 types), cold and hot drinks, fresh confectionery and desserts, made in our own confectionery shop (more than 35 types). There are vending machines with hot and cold drinks and confectionery in educational buildings and dormitories.

2.3. Financial support for postgraduate students

Postgraduate students of full-time education, studying at the expense of the state budget (for government contract), receive an academic scholarship once a month within proven university funding.

Size of academic scholarships, order of appointment and payment is determined by the Cabinet of Ministers of Ukraine.

For excellence in studying, taking part in scientific and public work postgraduate students may be allocated personal academic scholarship of SUTE and personalised academic scholarships of The President of Ukraine, Verkhovna Rada (Supreme Council) of Ukraine, Cabinet of Ministers of Ukraine, Kyiv City Head.

In order to improve living standards and incentives for academic achievements as well as for participation in social, sports and scientific activities, the university has the right to provide financial assistance and encouragement of undergraduate and postgraduate students enrolled for the state order for full-time study using the funds provided in the estimates of the university.

Scholarship Commission decides to provide material support and encouragement separately for each person and each payment.

Appointment and payment of scholarships to postgraduate students who are foreign citizens and stateless persons shall be in accordance with international agreements of Ukraine and of the Cabinet of Ministers of Ukraine.

2.4. Medical services

On the territory of campus there is a first aid post where a general practitioner together with a nurse and 2 paramedics, in case of need, can provide first emergency medical aid to postgraduate students.

Medical treatment of foreign citizens temporarily residing on the territory of Ukraine is carried out in public and municipal health facilities at their own expense including health insurance contracts with Ukrainian insurers.

2.5. Management of inclusive education

2.5.1. The organization of inclusive education at SUTE is regulated by Resolution № 635 of the Cabinet of Ministers of Ukraine dated 10.07.2019 "On Approval of the Procedure for the Organization of Inclusive Education in Higher Education Institutions" and is carried out in order to realize the right of persons with special educational needs to obtain quality higher education, taking into account the needs and capabilities of such persons.

2.5.2. People with special educational needs who are getting an education at a higher education institution are rated as the students with special educational needs.

2.5.3. The provision of educational services to applicants with special educational needs in SUTE is carried out on an equal basis, without discrimination, regardless of age, citizenship, place of residence, gender, skin color, social and property status, nationality, language, origin, state of health,

attitude towards religion, the presence of a criminal record, as well as other circumstances with the application of personally oriented teaching methods and taking into account the individual characteristics of the educational and cognitive activity of all education seekers, recommendations of an individual rehabilitation program for a person with a disability (if available) and/or a conclusion on a comprehensive psychological and pedagogical assessment of personal development (if available), provided by the inclusive resource center.

2.5.4. The organization of the educational process of applicants with special educational needs includes:

- creation of an inclusive educational environment;
- application of the principles of universal design in the educational process;
- bringing the territory of the University, buildings, structures and premises into compliance with the requirements of state construction norms, standards and rules. In the event that the existing buildings, structures and premises cannot be fully adapted for the needs of persons with disabilities, their reasonable adaptation is carried out taking into account the universal design;
- provision of the necessary educational and methodological materials and information and communication technologies for the organization of the educational process;
- providing, if necessary, a reasonable accommodation;
- application in the educational process of the most acceptable tools and methods of communication for students with special educational needs, including sign language, relief-dot Braille font, with the involvement of relevant specialists and teaching staff;
- ensuring the availability of information in various formats (Braille font, enlarged font, electronic format and others).

2.5.5. The individual plan for the implementation of the educational and scientific program of the applicant with special educational needs is developed with his participation, taking into account the recommendations of the individual rehabilitation program of the person with disabilities (if available) and/or the conclusion on the comprehensive psychological and pedagogical assessment of the child's development (if available).

2.5.6. Parents (other legal representatives) or persons authorized by them, social workers (workers), volunteers can accompany the applicant with special educational needs.

2.6. Digitization of University activities

There are numerous computer classes, large-format LED screens in lecture halls and projection equipment for presentations in all classrooms, a SMART library with VR technologies, a modern technical base for distance learning, updated computer equipment, free Wi-Fi, professional computer databases by types of activity, other innovations and trends in technical support.

Technical support is constantly being modernized. New servers and modern software were purchased and put into operation, allowing to automate the registration of postgraduate students and teachers, the procedure for choosing disciplines, drawing up curricula, forming the schedule and workload, developing educational and methodological materials, creating conditions for the synchronization of various information and technical platforms of the university. **Distance learning** makes it possible to implement interactive technologies for teaching material, to obtain a comprehensive higher education or to improve qualifications and has such advantages as flexibility, relevance, convenience, modularity, interactivity. At the university, distance learning is used as an element of the educational process, which is implemented using the Moodle corporate distance learning platform, numerous professionally oriented information products, including Fidelio, Amadeus Selling Platform, MapInfoPro 12.3, QD Professional, MD Office, Murashina logistics, etc.

In addition to the corporate distance learning platform Moodle, participants in the educational process widely use such software products as video conference systems Zoom, Skype, WebEx, Office 365 Teams platforms, GoogleClassroom, Intello, etc. Numerous messengers are used to communicate with students, scientific and pedagogical workers of the university.

The modern VR studio is equipped with OculusGo **virtual reality** glasses, computers for individual work and SMART-wall. There is a specially equipped location that serves as a video studio for bloggers and recording interviews, which is equipped with digital devices for audio and video recording.

At the request of young people, the university created an **eSports zone** - this is a modern eSports arena equipped with powerful gaming computers and a plasma panel with a PlayStationPro game console. In the eSports zone, eSports teams of SUTE train and open eSports tournaments " SUTEDota 2", "SUTEHearthstone" are held.

2.7. Learning facilities

One of the advantages of SUTE is the material and technical base of the European level. Classrooms are equipped with modern demonstration equipment, laboratories with the necessary equipment. In total, the university has 60 computer rooms, among which there are classrooms equipped for webinars, lectures, and practical classes when students are at the university and the teacher is remote. The resources as well as material and technical equipment of the library are innovative and meet the needs of training modern specialists, providing space for independent and team work.

The university has multifunctional co-working spaces specially equipped for the creative work of participants in the educational process.

SUTEHUB coworking space is designed for everyone who needs a comfortable and cozy workplace for productive work, training, meetings, searching for new ideas, negotiations, presentations, round tables and master classes. The modern, comfortable space unites 6 different zones - 3 work zones, a recreation hall, a conference hall and an area for negotiations, which ensures the cooperation of 70 participants.

PhygitalHub coworking space is divided into several work zones: the "Artspace" zone, which is intended for holding creative events and generating ideas; the "Mediationroom" zone, where students can resolve disputes out of court, learn the art of negotiation and subtleties of diplomacy; the main hall with the "starry sky" (neon constellation of Ursa Major and Ursa Minor). Coworking spaces are equipped with everything necessary for comfortable study and relaxation.

2.8. SUTE library

The library of SUTE is an informational, educational, cultural and educational structural unit of the university with universal document funds. The library directs its work to the development and improvement of information support for the scientific activities of SUTE, the creation of comfortable conditions in which every reader - student, postgraduate student, teacher, scientist - has the opportunity to receive high-quality information support using modern information and communication technologies.

The library's document fund includes almost 900,000 copies of books, periodicals, dissertations and abstracts, educational and methodological materials, and electronic publications. Publications in the state language make 60% of the total number of the fund.

The website of the SUTE library (lib.knute.edu.ua) is functioning effectively, with full information about the library, its funds and services, an electronic catalog, available electronic resources (scientometric, bibliographic, full-text databases) and information on the possibility of using remote access to full-text electronic databases.

Users are presented with instructions for searching the documents, drawing up lists of used sources according to various styles and standards common in the world, reference and educational information, virtual book exhibitions, 3D tours, reports on events held in the library. Access to the electronic catalog of the SUTE library can be obtained from mobile devices, the corresponding link for downloading the application is available on the library website.

At the service of library users: 11 reading rooms with open access funds, 7 subscriptions, Bibliometrics room, SMART library, unique VR

studio, Cybersport zone, halls of new arrivals of literature and foreign literature, special sectors of methodological publications of SUTE, fund of dissertations and abstracts, equipped with comfortable recreation areas with board games - football, chess and checkers.

The Bibliometrics Hall provides free online access to domestic and global full-text databases, scientometric research platforms: SCOPUS, WebofScience, EBSCO, etc. It contains a database of electronic textbooks, teaching materials, video courses on electronic media.

The SMART-library is an open space zoned for reading, holding conferences, lectures, workshops, presentations using the SMART-wall and plasma panel, HTCVive virtual reality helmets and OculusGo virtual reality glasses.

The introduction of new information technologies enables the library to significantly expand the information provision of users, which improves the quality of the educational process.

2.9. SUTE editions:

- **The scientific journal «Scientia Fructuosa» (professional journal of economic sciences, category B):**
  research on the problems of macroeconomic theory and reforming the economy of Ukraine is highlighted; increasing the efficiency of business activities in various fields; management and marketing in trade, hospitality and tourism; accounting, financial analysis and control; development of stock, insurance and banking markets, etc. Published in Ukrainian and English;
- **The International scientific and practical journal «Products and Markets» (professional journal of engineering sciences, category B):**
  issues of theory and practice of commodity science, new technologies, hotel and restaurant business, marketing, merchandising, logistics, quality and safety of goods (services), standardization, metrology, certification and quality management, protection of consumer rights are covered. Published in Ukrainian and English;
- **The scientific journal «Foreign trade: economics, finance, law» (professional journal of economic and legal sciences, category B):**
  the results of theoretical and practical scientific research in the field of international and domestic economy, finance and law are highlighted. Published in Ukrainian and English.

The journals are registered in the international scientometric databases Index Copernicus, Directory of Research Journals Indexing, DOAJ, Research Bible, and the Google Scholar search system, are presented in the national reference database "Ukrainika Naukova" and the Ukrainian reference journal "Dzherelo".

2.10. Organization of mobility according to educational programmes

The State University of Trade and Economics closely cooperates with universities, international partners on international mobility programs. These programs are aimed at implementing the principle of academic mobility.

Main tasks:
• promoting the participation of students of higher education of SUTE in international academic mobility educational programs of foreign HEIs-partners;
• improvement of language competences of higher education students, which are necessary for studying and teaching in foreign institutions of higher education;
• organizational and coordination work on the development and implementation of projects of the Erasmus+ program of the European Union under the direction of KA1 "Educational (academic) mobility".

SUTE provides the opportunity to study in European institutions of higher education to students of higher education and graduates who have equal rights with citizens of EU member states, in English or another foreign language in various specialties.

SUTE implements its functions on the basis of treaties on international cooperation and inter-institutional agreements, including Erasmus+ projects with higher education institutions in France, Germany, Slovenia, Bulgaria, Greece, Slovakia and other European higher education institutions. SUTE recognizes results in non-formal and informal education. The mechanisms are defined by the Regulation on the procedure for recognizing learning outcomes obtained in non-formal and informal education.

2.11. Language courses

SUTE provides training in English and French under an intensive training program that creates conditions for achieving foreign language proficiency levels from A1 to B2 (in accordance with the recommendations of the Committee on Education at the Council of Europe and Language Education).

Classes in foreign language courses are conducted by highly qualified teachers with practical teaching experience. Training takes place according to the modular system. The topics of the modules have been developed taking into account the needs of students of higher education, according to which teachers specially select topics for communication, educational materials, choose the type of tasks and types of activities.

The contingent of students is formed at the beginning of the academic year. Students and graduates of all faculties, postgraduate and doctoral students as well as teachers and employees of SUTE can enroll for foreign

language study programs. The cost of study depends on the level of the study program and the number of study hours.

Graduates of language courses who have mastered a foreign language at levels B1–B2 have the opportunity to take the exam for obtaining international language certificates (DELF-DALF, IELTS) and participate in various forms of international academic mobility within the framework of cooperation agreements with European higher education institutions – partners of SUTE.

For additional information and to enroll for foreign language courses, contact the International Relations Department (educational building A,   room 229, phone (044) 531 31 10).

2.12 Advisory assistance for postgraduate students

The Department of Postgraduate and Doctoral Studies helps postgraduate students to systematize the information scope, coordinate work between them and departments, other devisions of the university. Information is provided through online instruction, messages, during personal communication, by telephone or by means of a video conference.

The teaching staff of the SUTE departments offer consultative seminars to students of the third degree of higher education, during which young researchers are informed on both narrow professional and general scientific issues; the possibility of cooperation and establishment of partnership relations of the department with other research institutions of Ukraine; consultations on current issues of thesis, coverage of its results in domestic and foreign scientific publications. Postgraduate students have the opportunity to receive individual consultations, to report on the results of the research at the department's scientific and methodical seminars, to discuss it and to plan further steps as for the improvement of their research work. Information on programs of foreign foundations for conducting research abroad is also provided. The lecturers of the departments familiarize the students of higher education with the preparation and writing of requests for scientific internship. Young scientists receive consultations on the approval of their thesis results both at departmental seminars and at scientific conferences, get acquainted with the course of preparation of the thesis for defense and the procedure of its defense. Departments help in establishing contacts of young scientists with potential employers in universities and academic institutes of Ukraine and make efforts to maintain further scientific contacts with graduates in order to expand the scientific and research base.

2.13. Sports and recreation facilities

An important area of organizational and educational work of the University is the participation of postgraduate students in such traditional activities as: University Day, International Students' Day, Miss & Mr SUTE,

Faculty Open Days, Donor Days, Tourism Day, Championship of the intellectual games "Brain Ring" and "Your Game", Festival of wits and humor at SUTE for the Rector's Cup and more.

The university has culture and leisure center, which includes such creative amateur groups as:: folk student academic chamber choir, contemporary dance studio, vocal and contemporary music studio.

For the development of students and popularization of a healthy lifestyle, on the basis of the Department of Physical Culture and Sports, there are sections for table tennis, fitness, volleyball, swimming, badminton, basketball, boxing, football, futsal, athletic gymnastics, athletics, wrestling, crossfit, physical rehabilitation and general physical training, tug-of-war; for big tennis, modern tennis courts equipped with a specialized surface were built on the territory of the university. A new billiards section has been opened, for which a separate room with tables for various types of games has been arranged. All conditions for physical education and sports have been created: a modern stadium with an artificial turf, sports grounds, two sports arenas, a gym, a boxing and wrestling hall, fitness rooms, and tennis courts.

2.14. Youth organizations

Public life of SUTE is rich, multifaceted and diverse. On a voluntary basis at the university operate:
- scientific society of students, postgraduate and doctoral students and young researchers;
- university student council: 6 councils of student self-goverment at faculties and 6 councils of student self-goverment in dormitories;
– student clubs: "Eco Club", Debate Club "Polemic Union", Philosophy Club "Phoenix", "Law Club", "Legal Clinic", Entrepreneur Club "YEP Club", "Business Club", "Marketing", "SapLab", "H&SE Services", "ProgramClub", "TROS – creative advertising association of students", "Luca Pacioli Accounting Club", "Professional Accountant Club", "Auditor Club", "Union of SUTE Artists", "European Club", All-Ukrainian Movement "Youth for Consumer Rights", Chemists Club "Start in Science", "Culinary Club", Psychological Club "SAPGEN", Tourist Club "Everest", Club "Service", sports clubs in football, basketball, volleyball, tug-of-war and more.

2.15. Scientific society of students, postgraduate and doctoral students and young scientists

The main purpose of the activity of the Scientific society of students, postgraduates, doctoral students and young scientists of SUTE is to

comprehensively support the scientific, inventive and other creative activities of students and young scientists.

Main tasks:

1. Facilitating the formation of conditions for revealing the scientific and creative potential of young scientists.

2. Finding and supporting talented researchers among young scientists, providing them with comprehensive support.

3. Encouraging the development of the personality of a researcher, a modern scientist with a broad democratic outlook.

4. Organization and establishment of inter-university and international scientific and cultural cooperation.

Information and publishing activities.

Focus areas:
– development of science;
– work with young scientists;
– information support;
– implementation of Innovations;
– establishment of external relations.

In its activities, the Scientific society of students, postgraduates, doctoral students and young scientists of SUTE is governed by:
– the ethical code of a scientist of Ukraine;
– the regulation "On the scientific society of students, postgraduates and young scientists of the State University of Trade and Economics";
– the regulation on the observance of academic integrity by pedagogical, academic, research workers and higher education seekers of SUTE.

3. Educational and Scientific Programme

Head of the project group (Director of the PhD Programme) – Roskladka A.A., Doctor of Economics, Professor, Head of the Department of Digital Economy and System Analysis.
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3.1. Profile of Educational and Scientific Programme (ESP) of the third level of higher education, subject area 124 «System Analysis»

1 – Загальна інформація	
Full name of HEI and structural unit	State University of Trade and Economics
Higher education cycle	Third (educational and scientific) cycle
Higher education degree	Doctor of Philosophy
Field of study	12 Information Technology

Subject area	124 System Analysis
Official title of the educational programme	Information technology and Business Analytics (Data Science)
Forms of obtaining education	Full-time form / Part-time form
Educational qualification	Doctor of Philosophy in System Analysis
Diploma qualification	**Academic degree:** Doctor of Philosophy **Field of study:** 12 Information Technology **Subject area:** 124 System Analysis
The scope of the educational and scientific programme	240 ECTS credits
Availability of accreditation	Initial accreditation is planned for 2028
Cycle / level	QF for EHEA – third cycle; EQF for LLL – 8 level; NQF of Ukraine – 8 level;
Prerequisites	Master's degree The entrant's possession of the competencies and mastery of the learning outcomes defined by the standard of higher education in the subject area 124 «System Analysis» for the second (Master's) level of higher education (verified by entrance tests).
Language(s) of instruction	Ukrainian
Duration of the educational programme	4 years
Internet address of the permanent placement of the description of the educational programme	

2 – Educational and Scientific Programme Aim

Provide the student with in-depth knowledge, abilities, skills and other competencies sufficient for the production of new ideas in the field of data science, solving complex problems in the field of professional (economic) and/or research and innovation activities, mastering the methodology of scientific and pedagogical activities, as well as conducting scientific research, the results of which have scientific novelty, theoretical and practical significance.

3 - Educational and Scientific Programme Characteristics

Area of interest	*Object of activity (research):* mathematical methods and information technologies of data analysis, modeling, forecasting, design and decision-making regarding complex systems of various nature. *Learning goals:* acquiring the ability of a person to produce new ideas, to solve complex problems of professional and/or research and innovation activities in the field of data analysis, to conduct own scientific research, the results of which have scientific novelty, theoretical and practical significance. *Theoretical content of the subject area:* theory of control and decision-making, mathematical and computer modeling of systems and processes, management of IT projects and IT products, data

	analysis, operations research, system optimization. *Methods, techniques and technologies:* methods of mathematical modeling, data analysis, optimization and operations research, forecasting, system analysis, risk assessment, management and decision-making theory, game and conflict theory, applied and mathematical linguistics, intelligent technologies, expert evaluation, sustainable development. *Tools and equipment:* specialized software.
Orientation of the educational programme	Educational and scientific. Scientific research with new and improved, practically directed and valuable theoretical and methodological results in the field of the interests of SUTE scientific schools in information technologies.
The main focus of the educational programme	It is focused on the creation of new knowledge and methodologies in the field of intelligent business analysis in complex systems of various nature based on the systematic methodology of Data Science using information technologies.
Programme features	**The educational component** of the programme provides for 48 ECTS credits, of which: • 36 ECTS credits for compulsory educational components, including 3 ECTS credits of scientific and pedagogical practice; • 12 ECTS credits are provided for mastering optional educational components, which strengthen the cycle of professional training. The selective part of the programme enables the right to choose academic disciplines, taking into account the individual needs of postgraduate students. **The scientific component** of the programme involves carrying out scientific research under the supervision of a scientific advisor with appropriate registration and public defense of the obtained results in the form of a thesis. This component of the program covers 192 ECTS credits and is drawn up in the form of an individual plan of a postgraduate student's research work.
4 – Graduate Employability and Further Learnability	
Employment suitability	Employment in the positions of scientific and scientific-pedagogical workers in scientific institutions and institutions of higher education, other positions requiring the qualification of a doctor of philosophy in system analysis, in particular in the positions of scientific consultants, experts, analysts in research institutions and divisions of enterprises, institutions, organizations. Work according to the national classifier of Ukraine "Profession Classifier" DK 003:2010: 1238 Head of projects and programs; 2131.1 Consultant researcher (computer systems); 2131.2 Computer systems analyst; 2131.2 Data administrator; 2131.2 Computer data bank analyst; 2149.2 Analyst of systems (except computer systems); 2310. Teacher of universities and higher educational institutions. 2433.1 Consultant researcher (information analytics); 2433.2 Analyst of consolidated information. 2447 Professional in the field of project and program management. A graduate can hold other positions in accordance with professional job titles characterized by special professional competencies.
Further learning opportunities	· Educational and scientific programmes at the 8th level of the NQF of Ukraine in related fields of scientific knowledge.

	· Educational programmes, research grants and scholarships (including abroad) containing additional educational components. · Obtaining the scientific degree of Doctor of Sciences.
5 – Teaching and Assessment	
Teaching and learning	– Combination of lectures, practical classes, implementation of projects, analytical and research works. – Problem-oriented learning, self-learning. – Education with the use of elements of distance and interactive learning technologies. – Involvement in counseling of post-graduate students of well-known specialists in the field of science and practice. – Direct participation in the performance of research works.
Assessment	**Educational component of the programme.** The system of control of postgraduate students' mastery of the courses of the educational and scientific programme consists of current and final types of control. The current control is aimed at obtaining operational data on the level of knowledge of postgraduate students and the quality of the developed competencies. It involves the application of a complex of assessment methods: oral questioning, test control, implementation of project tasks, etc. The final control of knowledge is in the form of an exam/credit and is conducted as a form of assessment of the level of assimilation of theoretical and practical material by a postgraduate student in a particular academic course. **Scientific component of the programme.** Evaluation of the scientific activity of postgraduate students is carried out on the basis of quantitative and qualitative indicators characterizing the preparation of research papers, participation in scientific conferences, preparation of separate parts of a thesis in accordance with the approved individual plan of scientific work of the postgraduate student. Postgraduate students' reports based on the results of the implementation of the individual plan of scientific work are approved every six months at the meeting of the departments and the academic council of the faculty with the appropriate recommendation.
6 – Programme Competences	
Integral competence	The ability to produce new ideas, to solve complex problems in the field of professional and/or research and innovation activities in the field of intellectual data analysis, to apply the methodology of scientific and pedagogical activity, as well as to conduct one's own scientific research, the results of which have scientific novelty, theoretical and practical significance.
General competences (GCs)	GC 01. The ability to abstract thinking, analysis and synthesis. GC 02. The ability to search, process and analyze information from various sources. GC 03. The ability to solve complex problems in the field of systems analysis based on a systemic scientific worldview and a general cultural outlook while observing the principles of professional ethics and academic integrity.
Special (professional) competences (SCs)	SC 01. The ability to perform original research, to achieve scientific results that create new knowledge in systems analysis and related interdisciplinary areas and can be published in leading scientific publications in information technology and related fields.

	SC 02. The ability to orally and in writing present and discuss the results of scientific research and/or innovative developments in Ukrainian and English, a deep understanding of English-language scientific texts in the field of research.
	SC 03. The ability to carry out scientific and pedagogical activities in institutions of higher education, to use modern information technologies, databases and other electronic resources, specialized software in scientific and educational activities.
	SC 04. The ability to initiate, develop and implement complex innovative projects in the field of system analysis and related interdisciplinary projects, manage them, show leadership during their implementation, commercialize the results of scientific research and ensure compliance with intellectual property rights.
	SC 05. The ability to analyze and synthesize complex systems, develop their mathematical and computer models.
	SC 06. The ability to solve scientific or scientific-applied problems that arise in complex systems.
	SC 07. The ability to effectively use the theory and methods of Data Science in scientific research.
	SC 08. The ability to scientifically justify the procedures of research, analysis, systematization and processing of big data.
7 – Programme Learning Outcomes (PLOs)
	PLO 01. Have advanced conceptual and methodological knowledge of systems analysis and at the border of subject areas, as well as research skills sufficient to conduct scientific and applied research at the level of the latest world achievements in the relevant field, obtain new knowledge and/or implement innovations.
	PLO 02. Formulate and test hypotheses; use appropriate evidence to substantiate conclusions, in particular, the results of theoretical analysis, experimental research (surveys, observations) and mathematical and/or computer modeling, available literature data.
	PLO 03. Develop and research conceptual, mathematical, information and computer models of processes and systems, effectively use them to obtain new knowledge and/or create innovative products in the field of system analysis and related interdisciplinary areas.
	PLO 04. Apply databases and data repositories, information systems, modern tools and technologies for searching, processing and analyzing information.
	PLO 05. Develop and implement scientific projects according to the methodology of system analysis using information technologies, to ensure the commercialization of the results of scientific research and the observance of intellectual property rights.
	PLO 06. Deeply understand the general principles and methods of system analysis, apply them in one's own research and in teaching practice.
	PLO 07. Freely present and discuss with specialists and non-specialists the results of research, scientific and applied problems in the field of system analysis in national and foreign languages, publish in leading scientific publications.
	PLO 08. Plan, organize and conduct training sessions, develop the appropriate provision of educational components, evaluate learning outcomes, provide advisory support to students, develop and update educational programs, bear responsibility for the effectiveness of the

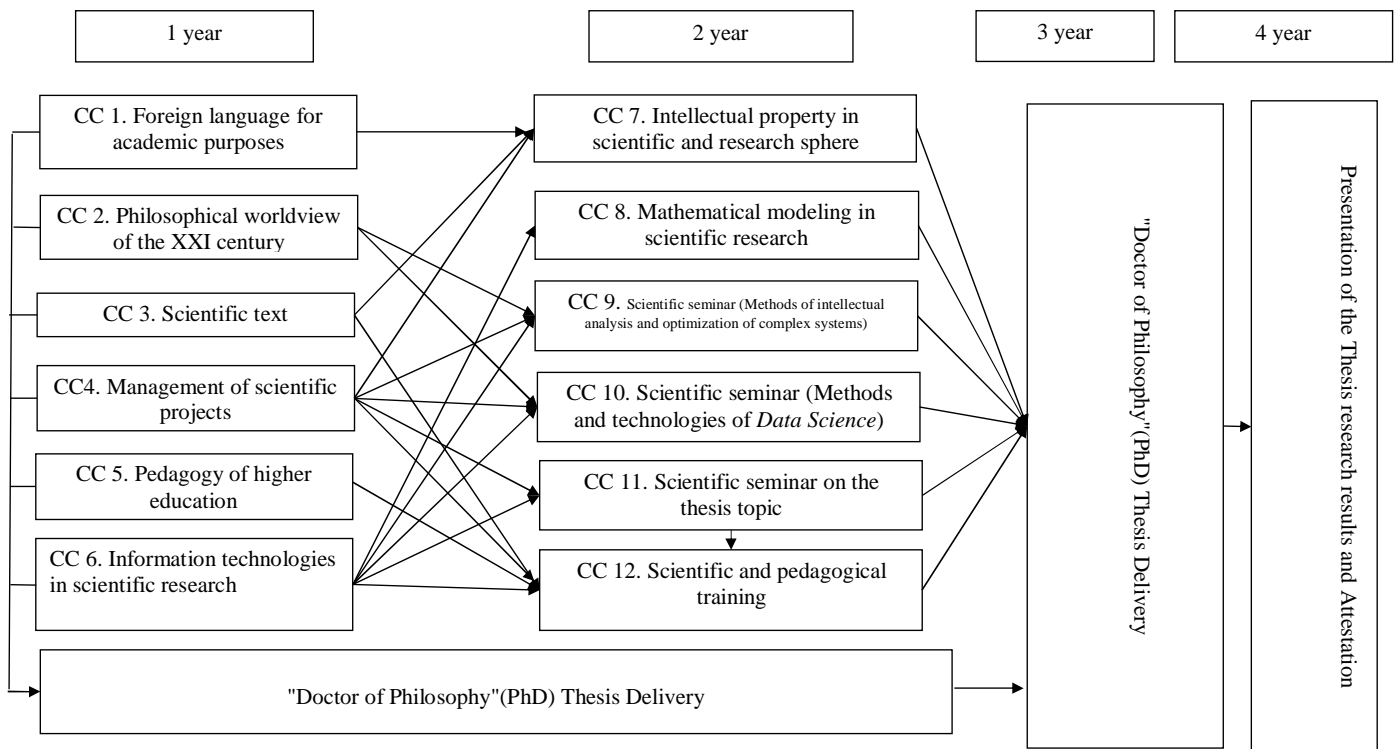|	educational process in compliance with the norms of academic ethics and integrity. PLO 09. Critically analyze, evaluate and synthesize new and complex ideas in the field of system analysis. PLO 10. Apply methods of data analysis of a large volume and complex structure, in particular, technologies of intelligent data analysis.
8 – Resource Support for Programme Implementation	
Staffing support	The implementation of the educational and scientific program is provided by teachers who have the scientific degrees "Candidate of Science", "Doctor of Science". Thematic master classes and open lectures by representatives of business, regulatory authorities, and public organizations are held to ensure that postgraduate students' scientific research meets the requirements of the socio-economic environment.
Material and technical support	Postgraduate students are fully provided with material resources for study and research. At their service: Ü more than 30 thousand m2 of educational buildings; Ü a separate dormitory for postgraduate students (over 80 rooms) Ü almost 1.5 million titles of educational and scientific literature in the SUTE library; Ü 470 seats in the SUTE reading rooms, including in the SUTE multimedia library, where access to SCOPUS, Web of Science scientometric databases is provided; Ü 2,000 PC workstations with access to the Internet + WiFi. All computers are equipped with basic software, special software is installed on the computers in the laboratories of the departments, necessary for conducting research by postgraduate students; Ü distance learning laboratory, which hosts 966 educational courses; – electronic platform for communication of postgraduate students based on Microsoft Office 365 platform, etc.
Informational support, teaching and learning materials	Complete provision of educational and methodological complexes of courses and other types of educational and methodological materials. Documents regulating admission procedures, postgraduate study, thesis defense, etc. are publicly available on the University's website. Communication between postgraduate students, supervisors, teachers, and administrative staff takes place within the intra-university communication environment, which includes the online resources of MIA Education, MS Outlook and MS Teams 365, the SUTE distance learning system, as well as using OTT services, mobile and fixed telephone connection.
9 – Academic Mobility	
National credit mobility	According to the agreements on cooperation between SUTE and institutions of higher education of Ukraine, scientific institutions.
International credit mobility	Within the scope of cooperation agreements between SUTE and institutions of higher education in France, Great Britain, Poland, Germany, within the framework of which partner exchange and training of postgraduate students is carried out. Studies in the KA1 direction with obtaining credits at the universities of member countries of the Erasmus+ Programme.
Training of foreign	Foreign students of higher education are guaranteed all rights and

applicants for higher education	freedoms, in accordance with the current legislation of Ukraine and the University Charter.

3.2. List of Educational and Scientific Programme (ESP) components and their logical sequence

3.2.1. List of Educational and Scientific Programme programme (ESP) components

Course code	Components of the Educational & Scientific Programme	Amount of credits	Final control form
1	2	3	4
Compulsory Components (CCs)			
CC 1	Foreign language for academic purposes	3	Exam
CC 2	Philosophical worldview of the XXI century	3	Exam
CC 3	Scientific text	3	Exam
CC 4	Management of scientific projects	3	Exam
CC 5	Pedagogy of higher education	3	Credit
CC 6	Information technologies in scientific research	3	Credit
CC 7	Intellectual property in scientific and research sphere	3	Credit
CC 8	Mathematical modeling in scientific research	3	Exam
CC 9	Scientific seminar (Methods of intellectual analysis and optimization of complex systems)	3	Credit
CC 10	Scientific seminar (Methods and technologies of *Data Science*)	3	Credit
CC 11	Scientific seminar on the thesis topic	3	Credit
CC 12	Scientific and pedagogical training	3	Credit
Total amount of compulsory components:		**36**	
Optional Components (OCs)			
OC 1	Public speaking	3	Credit
OC 2	Commercialization of intellectual property	3	Credit
OC 3	Design of complex systems	3	Credit
OC 4	Statistical methods of analysis and forecasting	3	Credit
OC 5	International statistics	3	Credit
OC 6	Web analytics	3	Credit
OC 7	Stochastic modeling	3	Credit
OC 8	Artificial Intelligence	3	Credit
OC 9	Scientific research methodology	3	Credit
OC 10	Another educational component in agreement with the academic supervisor	3	Credit
Total amount of optional components:		**12**	
Total scope of the educational component of the educational and scientific programme		**48**	
Thesis delivery (scientific component)		**156**	
Presentation of the Thesis research results and Attestation		**36**	
Total scope of the educational and scientific programme		**240**	

3.2.2. Structural and logical scheme of the Educational and Scientific Programme

1 year	2 year	3 year	4 year

CC 1. Foreign language for academic purposes

CC 2. Philosophical worldview of the XXI century

CC 3. Scientific text

CC4. Management of scientific projects

CC 5. Pedagogy of higher education

CC 6. Information technologies in scientific research

CC 7. Intellectual property in scientific and research sphere

CC 8. Mathematical modeling in scientific research

CC 9. Scientific seminar (Methods of intellectual analysis and optimization of complex systems)

CC 10. Scientific seminar (Methods and technologies of *Data Science*)

CC 11. Scientific seminar on the thesis topic

CC 12. Scientific and pedagogical training

"Doctor of Philosophy"(PhD) Thesis Delivery

"Doctor of Philosophy"(PhD) Thesis Delivery

Presentation of the Thesis research results and Attestation

3.3. Form of attestation of higher education applicants

Attestation of the applicants for the educational level "Doctor of Philosophy" is carried out in the form of a public thesis defense.

Thesis for obtaining the "Doctor of Philosophy"(PhD) degree is an independent comprehensive study that proposes a solution to a complex problem in the field of system analysis or on its border with other subject areas and involves a deep rethinking of existing and the creation of new holistic knowledge and/or professional practice.

Thesis should not contain academic plagiarism, falsification, fabrication.

Thesis must be posted on the SUTE website.

3.4. Matrix of correspondence of programme competences to compulsory components of the Educational and Scientific Programme

| | Educational component | | | | | | | | | | | | Scientific component |
	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11	CC 12	
GC 01	·	·	·					·			·		·
GC 02			·	·		·				·	·		·
GC 03		·		·							·		·
SC 01			·					·	·	·	·		·
SC 02	·		·	·	·						·		·
SC 03			·		·						·		·
SC 04			·	·			·				·		·
SC 05						·		·	·	·	·		·
SC 06								·	·	·	·		·
SC 07						·		·		·	·	·	·
SC 08						·		·	·	·	·	·	·

3.5. Matrix for providing Programme Learning Outcomes (PLOs) with compulsory components of the Educational and Scientific Programme

	Educational component												Scientific component
	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11	CC 12	
PLO 01				.		.		.	.	.	.	.	.
PLO 02								.	.	.	.		.
PLO 03						.		.	.	.	.	.	.
PLO 04			.			.		.	.	.	.		.
PLO 05				.			.				.		.
PLO 06									.	.	.		.
PLO 07	.		.		.						.		.
PLO 08			.		.						.		.
PLO 09		.		.					.	.	.		.
PLO 10									.	.	.	.	.

3.6. Matrix of correspondence of programme competences to optional components of the Educational and Scientific Programme

	OC 1	OC 2	OC 3	OC 4	OC 5	OC 6	OC 7	OC 8	OC 9	OC 10
GC 01	.		.					.		
GC 02			.	.	.	.	.			
GC 03			.					.	.	
SC 01		.	.	.				.	.	
SC 02	.				.	.				
SC 03	.								.	*
SC 04		.							.	
SC 05			.	.			.	.		
SC 06			.	.			.	.	.	
SC 07			.	.		.				
SC 08				.	.	.		.		

The course forms competences in accordance with the specifics of the educational trajectory chosen by the candidate of higher education

3.7. Matrix for providing Programme Learning Outcomes (PLOs) with optional components of the Educational and Scientific Programme

	OC 1	OC 2	OC 3	OC 4	OC 5	OC 6	OC 7	OC 8	OC 9	OC 10
PLO 01			.				.	.	.	*
PLO 02				.	.	.		.	.	
PLO 03			.	.			.			
PLO 04					.	.			.	
PLO 05		.							.	
PLO 06	.		.							
PLO 07	.								.	
PLO 08	.					.			.	
PLO 09			.					.		
PLO 10					.	.		.		

* The course forms competences in accordance with the specifics of the educational trajectory chosen by the candidate of higher education

4. Information about educational components (Courses, scientific seminars)

4.1. Course title. FOREIGN LANGUAGE FOR ACADEMIC PURPOSES.
Type. Compulsory course.
Academic year. 2024/2025, I/II semesters.
Lecturer, academic degree, rank, position. Pryma V.V., PhD in Philology, Associate Professor of the Department of Foreign Philology and Translation, Soshko O.G., PhD in Philology, Associate Professor of the Department of Foreign Philology and Translation.
Learning outcomes. Acquisition of language competencies sufficient to present and discussion of the results of their scientific work in a foreign language in oral and written form, as well as a full understanding of foreign scientific and professional texts in the relevant specialty, in particular:
· be fluent in a foreign language for professional purposes in order to carry out professional and scientific communication, international cooperation, defending own scientific views;
· work with foreign sources of a professional nature;

· find, analyze and use information from various foreign professional sources in scientific activities, interpret the results of scientific research in a foreign language;

· communicate the results of research to colleagues in a clear and understandable way and participate in a critical dialogue and discussion of economics and foreign language management;

· translate foreign professional texts into the native language;

· listen to and take notes of lectures, prepare and conduct seminars in a foreign language;

· understand information during discussions of lectures, reports and to express own position during professional and scientific communication;

· demonstrate conscious mastery of spelling, lexical, grammatical and stylistic norms of a modern foreign language;

· use special terminology to solve professional problems.

Content. Personal and professional identification. Specifics of the scientific style of language, genres of scientific works. Technical and scientific articles and reports, term formation. Communication in a foreign language in a scientific and professional environment. Technologies for working with scientific (professional) texts, features of using a dictionary and reference literature.

Recommended sources and other learning resources/tools.

1. Латигіна А.Г. English of Economics for Post-Graduate Students / А.Г. Латигіна. – Київ : Київ. нац. торг.-екон. ун-т, 2019. – 224 с.
2. Brook-HartGuy. BusinessBenchmark / GuyBrook-Hart. – CambridgeUniversityPress, 2020. – 194 p.
3. De Chazal E., McCarter. Oxford English for Academic Purposes. Upper Intermidiate, Oxford: Oxford University Press, 2020, 238p.
4. Swalesn J. AcademicWritingforGraduateStudents: EssentialSkillsandTasks / J. Swalesn, C. Feak. – MichiganUniversityPress, 2019. – 344 p.

Planned learning activities and teaching methods. Practical classes, independent work. Use of traditional and innovative methods and technologies of training: explanatory-illustrative, problem-searching, communicative methods; methods of interactive learning (presentation, discussion, situation modeling, computer technology).

Assessment methods:
- current control (oral examination, test control, verification of prepared presentations and abstracts)
- final control (exam).

Language of training. English, Ukrainian.

4.2. Course title. PHILOSOPHICAL WORLDVIEW OF THE XXI CENTURY.

Type. Compulsory course.

Academic year. 2024/2025, I/II semesters.

Lecturer, academic degree, rank, position. Morozov A.Y., Doctor of Sciences (Philosophy) , Professor , Professor of the Department of Philosophy, Sociology and Political Science.

Learning outcomes. Provide postgraduate students with modern systemic philosophical and scientific knowledge on the main problems of human development, society and civilization in the XXI century, to promote the formation of general theoretical and methodological foundations of scientific thinking and scientific knowledge, their practical use in the future professional activity of a scientist with the educational degree "Doctor of Philosophy".

Content. Philosophical worldview of the XXI century: theoretical concept. Socio-humanitarian discourse of the basic concepts of globalization. Modern global science as a post-classical type of scientific rationality. Methodology and metatheory of modern science: cognitive analysis. Philosophy of innovation in the theory and practice of post-industrial society. Socio-philosophical reflections of modern economics. Information challenge of post-industrial civilization. Anthropological imperatives in the development of philosophy in the XXI century. Global ideologies: contamination of divergence and convergence. Massification and aberration of modern global consciousness and culture.

Recommended sources and other learning resources/tools.

1. Після кінця історії: розмови з Френсісом Фукуямою. – Київ : Основи, 2021. – 310 с.
2. Тейлор Ч. Секулярна доба. Частина II / Ч. Тейлор. – Київ : Дух і Літера, 2020. – 400 с.
3. Франкл В. Людина в пошуках справжнього сенсу. – К.: Основи, 2021. – 290 с.

Planned learning activities and teaching methods. Lectures, seminars, practical classes, independent work.

Assessment methods:

- current control (questioning, colloquia, testing);
- final control (exam).

Knowledge and skills of postgraduate students are based on the results of current and final tests on a 100-point scale.

Language of training. Ukrainian.

4.3. Course title. SCIENTIFIC TEXT.

Type. Compulsory course.
Academic year. 2024/2025, I semester.
Lecturer, academic degree, rank, position.
Evgeniia Kyianytsia, PhD in Social Communication, Associate Professor of the Department of Journalism and Advertising.
Learning outcomes. Formation of a set of theoretical knowledge and practical skills on the methodology and techniques of compiling scientific texts.
Content. Scientific style of presenting information. Scientific text, its structure and composition rules. Classification of scientific texts and their titles. Possibilities of presentation of scientific research. The essence and types of scientific text editing. Basics of proofreading a scientific text. Rules for creating references and citations in various types of scientific text. International and Ukrainian standardization system for compiling bibliographic descriptions, its use in various types of scientific texts.
Recommended sources and other learning resources/tools.

1. Баган М.П. Культура української наукової мови: [посібник для самостійної роботи студентів]. Київ: Видавничий центр КНЛУ, 2022. 48 с.
2. Онуфрієнко Г. Науковий стиль української мови. Навчальний посібник з алгоритмічними приписами / Галина Онуфрієнко. Київ : Центр учбової літератури. 2021. 426 с.
3. Основи наукового мовлення: навчальний посібник: / С. А. Бронікова та ін.; за ред. І. М. Плотницької, Р. І. Ленди. Київ: Вид-во «Центр учбової літератури», 2022. 252 с.

Planned learning activities and teaching methods. Lectures, practical classes with the use of information technologies.
Assessment methods:
- current control (text analysis, writing scientific texts, testing, checking individual tasks, project defence);
- final control: exam.
Language of training. Ukrainian.

4.4. Course title. MANAGEMENT OF SCIENTIFIC PROJECTS.
Type. Compulsory course.
Academic year. 2024/2025, I semester.
Lecturer, academic degree, rank, position.
Kryvoruchko O. V., Doctor of Technical Sciences, Professor, Head of the Department of Software Engineering and Cybersecurity.
Content. Project management and its significance in the scientific development of society. Justification of the feasibility of the scientific

project. Creation of a scientific project. Organization of the scientific project management system. Methodology of scientific project implementation. Development of the scientific project schedule. Organization of the process of financing scientific projects. Tools of grant funding and their role in the implementation of scientific projects and programs. Organization of bidding by projects. Management of scientific projects in the conditions of digitization. Risk management of scientific projects. Corporate scientific projects and programs. Management of the quality of scientific projects. Software for the scientific project management process.

Recommended sources and other learning resources/tools.

1. Сусліков Л.М., Студеняк І.П. Управління науковими проєктами: електронний навчальний посібник. 100 Мбайт. Ужгород: ДВНЗ «УжНУ», 2020. 409 сл. 1 електрон.опт.диск (SD_R) кольор.; 12 см. – Систем.вимоги: Windows XP (або більш пізня); MS Power Point 2013/2016. Назва з титутлу екрану. ISBN 978-617-7825-06-6

2. Сазонець І. Л., Ковшун Н. Е. Управління науковими проектами: навчальний посібник / І. Л. Сазонець, Н. Е. Ковшун. — Київ: «Центр учбової літератури», 2021. — 208 с.

3. Блага, Н. В. (2021). Управління проєктами. Львівський університет внутрішніх справ. URL: http://surl.li/gsdcp

Planned learning activities and teaching methods.

A combination of traditional and non-traditional teaching methods with the use of innovative technologies: lectures (thematic, problem-based); practical classes (traditional, work in small groups, interactive online technologies, individual projects).

Assessment methods:
- current control (testing, oral and written questioning, verification of practical and independent works);
- module test;
- final control (exam).

Language of training. Ukrainian.

4.5. Course title. INFORMATION TECHNOLOGIES IN SCIENTIFIC RESEARCH.

Type. Compulsory course.

Academic year. 2024/2025, I semester.

Lecturer, academic degree, rank, position. Tsyutsyura S.V., Doctor of Technical Sciences, Professor, Professor of the Department of Software Engineering and Cybersecurity.

Learning outcomes. The formation of post-graduate students' informational and communicative competencies, related to the understanding of the essence and possibilities of the modern information environment regarding the implementation of scientific research and scientific-pedagogical activities, the use of information technologies and systems in scientific research for the purposeful search and systematization of scientific information, planning of experiments, processing and data analysis using software tools, methods of economic and mathematical modeling, database technologies, use of computer networks and Internet scientific and educational resources.

Content. The essence and possibilities of modern information technologies in solving tasks of professional and scientific activity. Regulatory and legal bases of the use of information technologies. Technical and software means of implementing information processes. Information technology means of data structuring and organization. Database technologies. Information technologies in research work. Processing of scientific data using special packages of application programs. Computer tools for working with text and graphic information. Information technologies for processing the results of scientific research. Application of network information technologies and telecommunications in scientific research.

Recommended sources and other learning resources/tools.

1. Артем'єва І. О. Напрями розвитку системи статистичного вимірювання параметрів цифрової економіки / І. О. Артем'єва // Статистика України. – Київ, 2020. – № 1. – С. 66–74.
2. Близнюк М. Основи вивчення інформаційних технологій: теоретичні і методичні засади / М. Близнюк // Вища шк. – Київ, 2019. – № 12. – С. 47–57.
3. Гриценко В. І. Гармонізація національних і міжнародних стандартів впровадження технологій цифрової економіки / В. І. Гриценко, Л. І. Бажан // Control systems & computers. – 2020. – № 3. – С. 3–14.
4. Паєтко Т. В. Діджиталізація урядової бюрократії в європейських країнах: корупційні ризики та антикорупційні ефекти / Т. В. Паєтко, В. М. Федосов // Фінанси України. – Київ : Академія фінансового управління, 2020. – № 8. – С. 86–102.

Planned learning activities and teaching methods. A combination of traditional and non-traditional teaching methods with the use of innovative technologies: lectures (thematic, problem-based) using multimedia tools; practical works (traditional, creative tasks); application of distance learning elements.

Assessment methods:

- current control (questioning, testing);

- final control (credit).
Language of training. Ukrainian.

4.6. Course title. PEDAGOGY OF HIGHER EDUCATION.
Type. Compulsory course.
Academic year. 2024/2025, II semester.
Lecturer, academic degree, rank, position. Golovnia Y.I., Candidate of Economic Sciences, Associate Professor, Associate Professor of the Department of Public Management and Administration.
Learning outcomes. Formation of postgraduate students' knowledge about the content and directions of higher education reform; theoretical, organizational-procedural, methodical principles of the process of education and upbringing of student youth, their scientific and professional training in accordance with state and European standards, the needs of society.
Content. The system of higher education in Ukraine and abroad. Management of the educational process of higher education. Didactic bases of pedagogical process. Methods and forms of organization of the educational process in a higher education institution. Innovative and information technologies in higher education. The educational process in higher education institution as a way to implement the tasks of professional training of students. Pedagogical skill of a teacher of a higher education institution. Pedagogical practice as a factor in the professional development of the future teacher.
Recommended sources and other learning resources/tools.
1. Педагогіка вищої школи : Підручник для здобувачів другого рівня вищої освіти педагогічних університетів / С.Г. Немченко, В.В. Крижко, І.Ф. Шумілова, О.М. Старокожко, О.Б. Голік. Бердянськ: БДПУ, 2020. 517 с.
2. Марцева Л.А. Педагогіка і психологія вищої школи : навч. посіб. / Л.А. Марцева. – Електронні дані. – Житомир: Державний університет «Житомирська політехніка», 2022. – 150 с.
3. Освіта України в умовах воєнного стану. Інноваційна та проєктна діяльність: Науково-методичний збірник/ за загальною ред. С. М. Шкарлета. Київ-Чернівці «Букрек». 2022. 140 с.
Planned learning activities and teaching methods. Problem and thematic lectures, seminars with the use of presentations, discussions, work in small groups, etc.
Assessment methods:
- final control (credit).
Language of training. Ukrainian.

4.7. Course title. INTELLECTUAL PROPERTY IN SCIENTIFIC AND RESEARCH SPHERE.

Type. Compulsory course.

Academic year. 2025/2026, I semester.

Lecturer, academic degree, rank, position. Hurzhii A.V., Doctor of Law, Associate Professor, Associate Professor of the Department of Administrative, Financial and Information Law.

Learning outcomes. The discipline "Intellectual Property in the Research Sphere", as a mandatory component of the educational program, provides students with general and professional competencies to achieve program learning outcomes in relevant educational and professional programs: the formation of in-depth knowledge and comprehensive understanding of international law, national legal system, legal and economic policy of the state and leading international institutions; ability to apply legal knowledge and implement the results of scientific research in rule-making, law enforcement, teaching and other professional activities.

Content. The first part of the discipline is devoted to the study of the concept of intellectual activity and its result in the research field. The specifics and legal nature of the results of intellectual activity, as well as the system of legislation of Ukraine in this area are studied. In the second part, much attention is paid to the study of copyright in research, namely the emergence of legal relations between co-authors and the conclusion of agreements on the right to use copyright. Copyright on collected volumes and other compiled works is considered in detail. The procedure of registration of objects of copyright and related rights is studied. The third part is devoted to offenses in the field of copyright and related rights. Issues such as plagiarism and piracy are considered in detail. Academic integrity in research. The order of observance of academic integrity by students. The last section of the discipline is devoted to the consideration of legal liability for intellectual property offenses in the research field.

Recommended sources and other learning resources/tools.

1. Право інтелектуальної власності: підручник / за заг.ред.О.І.Харитонова. Дмитришин В.С. Київ: Юрінком Інтер, 2023. – 540 с.

2. Інтелектуальна власність: підручник. Л.М. Попова., А.В. Хромов, І.В. Шуба: Харків, «Федорко», 2021, с. – 262.

3. Інтелектуальна власність та патентознавство: підручник / Н. О. Білоусова, Н. В. Гаврушкевич, та ін. : за ред. проф. П. М. Цибульова та доц. А. С. Ромашко. Київ: КПІ ім. Ігоря Сікорського, Вид-во «Політехніка», 2021. – 374с.

Planned learning activities and teaching methods. A combination of traditional and non-traditional teaching methods with the use of innovative technologies: lectures (review / thematic); seminars / practical classes.
Assessment methods:
- current control (testing, oral / written questioning, solving legal problems, etc.);
- final control (credit).
Language of training. Ukrainian.

4.8. Course title. MATHEMATICAL MODELING IN SCIENTIFIC RESEARCH.
Тип. Compulsory course.
Academic year. 2025/2026.
Lecturer, academic degree, rank, position. Roskladka A.A., Doctor of Economics, Professor, Head of the Department of Digital Economy and System Analysis.
Learning outcomes. Formation of a system of knowledge on methodology and tools for building and using various types of mathematical models during scientific research.
Content. Conceptual aspects of the application of mathematical modeling in scientific activity. Optimization models. Mathematical forecasting models. Study of the quality of mathematical models. Alternative ranking methods. Expert modeling methods in scientific research. Mathematical models of decision-making under conditions of uncertainty.
Recommended sources and other learning resources/tools.
1. Добротвор І.Г. Системний аналіз : навч. посіб. / І.Г. Добротвор, А.О. Саченко, Л. М. Буяк. – Тернопіль : ТНЕУ, 2019. – 170 с.
2. Шувалова Ю.С. Економіко-математичні моделі задач лінійного програмування. Завдання та методичні вказівки до виконання індивідуальних завдань з дисципліни «Оптимізаційні методи і моделі» / Ю.С. Шувалова, О.О. Гончарова. – Харків : УкрДУЗТ, 2019. – 62 с.
3. Tovey C. A. Linear Optimization and Duality. A modern Exposition / Craig A. Tovey. – Chapman and Hall/CRC, 2021. – 585 p.
4. Kulakowski K. Understanding the Analytic Hierarchy Process / Konrad Kulakowski. – Chapman and Hall/CRC, 2020. – 262 p.
5. Bhunia A. K., Sahoo L., Shaikh A. A. Advanced Optimization and Operations Research / Asoke Kumar Bhunia, Laxminarayan Sahoo, Ali Akbar Shaikh. – Singapore : Springer Singapore Pte. Limited, 2020. – 626 p.
Planned learning activities and teaching methods. A combination of traditional and non-traditional teaching methods with the use of innovative technologies: lectures (thematic, problem-based); practical classes (traditional, work in small groups, interactive online technologies).
Assessment methods:

- current control (testing, oral and written questioning, verification of practical and independent works);
- module test;
- final control (credit).
Language of training. Ukrainian.

4.9. Course title. METHODS OF INTELLECTUAL ANALYSIS AND OPTIMIZATION OF COMPLEX SYSTEMS.
Type. Compulsory course (scientific seminar).
Academic year. 2024/2026.
Lecturer, academic degree, rank, position. Nataliia Geseleva, PhD in Technical Sciences, Associate Professor, Associate Professor of the Department of Digital Economy and System Analysis.
Learning outcomes. Obtaining theoretical knowledge about the mechanisms of processing and presenting knowledge in intelligent systems, understanding the problems that arise during the construction and use of modern intelligent systems, and acquiring practical skills for using artificial intelligence and intelligent control systems to solve applied problems. Acquisition of theoretical knowledge and practical skills of quantitative analysis and optimization of complex economic processes.
Content. Conceptual foundations of building intelligent systems. Network models of complex systems representation. Approaches to creating expert systems. Methods of fuzzy logic in intelligent systems. Intelligent interfaces. Mathematical methods and models for evaluating system characteristics of the enterprise: maneuverability, reliability, tension. Modeling and analysis of strategies of complex economic systems. Instability and nonlinearity of dynamic systems. Methodology of systematic research of economic development. Modeling of economic systems in conditions of vague uncertainty. Modeling of economic systems under conditions of stochastic uncertainty. Stochastic models of economic dynamics. Multi-criteria mathematical models of economic systems. Tasks and methods of system analysis of multifactorial risks.
Recommended sources and other learning resources/tools.
1. Величко О. М., Гордієнко Т. Б. Основи системного аналізу і прийняття оптимальних рішень: Підручник.– Одеса: Олді+, 2021. – 672с.
2. Математичні моделі і методи прийняття рішень для сталого розвитку : навч. посіб. / О. В. Трифонова, Л. В. Тимошенко, С. А. Ус ; М-во освіти і науки України, Нац. техн. ун-т «Дніпровська політехніка». – Дніпро : НТУ «ДП», 2023. – 240 с.

3. Системи і методи підтримки прийняття рішень: підручник / П.І. Бідюк, О.Л. Тимощук, А.Є. Коваленко, Л.О. Коршевнюк. – Київ: КПІ ім. Ігоря Сікорського, 2022. – 610 с

4.10. Course title. DATA SCIENCE METHODS AND TECHNOLOGIES.

Type. Compulsory course (scientific seminar).

Academic year. 2024/2026.

Lecturer, academic degree, rank, position. Volodymyr Kulazhenko, PhD in Economics, Associate Professor, Associate Professor of the Department of Digital Economy and System Analysis.

Learning outcomes. Understanding the Basic Concepts of Data Science: familiarity with the basic concepts, methods and technologies underlying Data Science. Mastering various methods of data analysis. Learning key methods of statistical analysis, machine learning and deep learning. Formulation of Data Science tasks, selection of appropriate methods and tools for solving them. Application of Data Science tools and technologies: popular Data Science tools and technologies (Python, R, Hadoop, Spark, TensorFlow). Data Science model creation and evaluation. Procedures for developing, training and evaluating Data Science models using different algorithms. Using Data Science to solve real problems in various fields (business, science, health care).

Content. Definition of Data Science, history of development, areas of application, key concepts. Basic methods of statistical analysis, data visualization, pattern detection, hypothesis testing. Classification and regression, machine learning algorithms (logistic regression, SVM, decision tree, k-nearest neighbors, neural networks). The concept of deep learning, types of neural networks (convolutional, recurrent), applications in various fields. Natural language processing: text data processing algorithms, entity detection, translation, tonality analysis. Overview of popular Data Science tools and platforms (Python, R, Hadoop, Spark, TensorFlow, Jupyter Notebook). Addressing the ethical aspects of using Data Science, data privacy, biases in algorithms.

Recommended sources and other learning resources/tools.

1. Gareth J. et al. An introduction to statistical learning: With applications in python. Springer Nature, 2023.

2. Aurélien Géron, "Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools,
and Techniques to Build Intelligent Systems," O'Reilly Media, 2019.

3. Stanford Machine Learning Course:
   https://www.coursera.org/learn/machine-learning.

4.11. Course title. PUBLIC SPEAKING.
Type. Elective course.
Academic year. 2024/2026.
Lecturer, academic degree, rank, position. Razitskii V. I., Candidate of Historical Sciences, Associate Professor, Associate Professor of the Department of Philosophy, Sociology and Political Science.
Learning outcomes. Ability to prove the results of research and innovation and publicly present them, discuss them and discuss with the scientific and professional community. Ability to apply the acquired communicative competencies and ethical guidelines for scientific discussions and to find solutions to current problems of philosophy.
Content. Oratory as a component of personality culture. The concept of public speaking. Functions of eloquence. Oratory in the humanities. Goals and objectives of public speaking. Formation of a positive professional image by means of language. The main stages of the origin and development of public speaking. Fundamentals of oratory skills of the teacher. Public speech of the teacher. Development of eloquence in Ukraine. Speaker and audience. Public speech. Figures of public speaking. Fundamentals of speech technique in public speaking. Evidence and justification in a public speech.
Recommended sources and other learning resources/tools.
1. Борг Дж. Мистецтво говорити. – Фабула, 2020. – 304 с.
2. Молдован В. Судова риторика. – Київ : Юрінком Інтер, 2020. – 496 с.
3. Сучасні технології нейролінгвістичного програмування / О. Черненко, С. Гнатюк, В. Петрик, В. Гурєєв, В. Курганевич. – Київ : Центр навчальної літератури, 2021. – 200 с.
4. Marcus Alexander. The Public Speaking Bible. – Marcus Alexander Publishing, 2021. – 210 p.
Planned learning activities and teaching methods.
Lectures, seminars, practical tasks, independent work.
Assessment methods:
- current control (questioning, colloquia, testing);
- final control (credit).
Language of training. Ukrainian.

4.12. Course title. COMMERCIALIZATION OF INTELLECTUAL PROPERTY.

Type. Elective course.

Academic year. 2024/2026.

Lecturer, academic degree, rank, position. Zhukovska V.M., Doctor of Economic Sciences, Associate Professor, Professor of the Department of Management.

Learning outcomes. The development of theoretical knowledge and practical skills in higher education applicants for the degree of Doctor of Philosophy regarding the mechanism and organizational and legal provision of commercialization of the results of scientific research and development, the application of specific methods and tools of commercialization, acquisition of professional competences in planning, organization and control of commercialization projects.

Content. The essence and mechanism of commercialization of the results of scientific research and development as objects of intellectual property law. Methods of commercialization of the results of scientific research and development. Stages and forms of commercialization of the results of scientific research. Objects of industrial property and methods of their commercialization. Compilation and submission of an application for an invention and utility model. Technological audit of the object of commercialization. Valuation of intellectual property rights. Licensing as a form of commercialization of the results of scientific research and development. Principles and methods of license price calculation. Marketing of the results of scientific research and development. Commercialization of objects using artificial intelligence. Transfer at the company.

Recommended sources and other learning resources/tools.

1. Комерціалізація інновацій: Конспект лекцій [Електронний ресурс] : навч. посіб. для студ. спеціальності 073 «Менеджмент», освітньо-професійної програми «Менеджмент інвестицій та інновацій» / КПІ ім. Ігоря Сікорського ; уклад.: С.О.Пермінова. – Електронні текстові дані (1 файл: 287 КБ). Київ : КПІ ім. Ігоря Сікорського. 2020.127 с.

2. Коваль І. Ф. Комерціалізація прав інтелектуальної власності : навч. Посіб. Донец. нац. ун-т ім. Василя Стуса, Наук.-дослід. ін-т інтелект. власності. Київ : Юрінком Інтер, 2018. 271 с.

3. Остапович Г. М., Стороженко О. М., Уманців Г. В., Фоміна О. В.Інтелектуальна власність: навч. посіб.. К.: КНТЕУ, 2022. 456 с.

4. Сагер Л. Ю., Сигиди Л. О. Комерціалізація інновацій: захист інтелектуального капіталу, маркетинг та комунікації : монографія. Суми: Сумський державний університет, 2022. 363 с.

5. Мікульонок.І. О. М. Інтелектуальна власність та патентознавство: підручник. 3-тє вид., перероб. та доповн. Київ: КПІ ім. Ігоря Сікорського, Вид-во «Політехніка», 2019. – 244 с.

6. Your Guide to IP Commercialization. The European IP helpdesk. 2019. – URL: https://www.iprhelpdesk.eu/sites/default/files/2018-12/european-ipr-helpdesk-your-guide-to-ip-commercialisation.pdf

Planned learning activities and teaching methods.
A combination of traditional and non-traditional teaching methods with the use of innovative technologies: problem lectures, case study method, practical tasks with the use of information technologies, presentations, solving computational and analytical problems, independent work of students.

Assessment methods:
- current control (testing, verification of individual tasks, situational exercises, speaking in a discussion, solving analytical and calculation tasks, project defence).

Language of training. Ukrainian.

4.13. Course title. DESIGN OF COMPLEX SYSTEMS.

Type. Elective course.

Academic year. 2024/2026.

Lecturer, academic degree, rank, position. Kryvoruchko O.V., Doctor of Technical Sciences, Professor, Head of the Department of Software Engineering and CyberSecurity.

Learning outcomes. The ability to apply modern computer technology in scientific activities for theoretical and experimental research. Be able to use Internet technologies to build service-oriented systems. Be able to develop and use an integrated software environment based on service-oriented technologies (SOA) and ESB bus topology. Be able to effectively maintain information security and perform system administration of computer networks.

Content. Basic concepts of technology for designing complex systems. The life cycle of complex IP software. Canonical IP design. Typical IP design. The concept of a typical project, the prerequisites for typing. Analysis and modeling of the functional area of IP implementation. Comprehensive information security system in software-controlled IP. Specification of functional requirements for IP. Subject area modeling methodologies. Structural model of the subject area. Case-tools for business process modeling. BPwin tooling environment. Information support of IP. Modeling of information support. Unified Modeling Language Unified Modeling Language (UML). Stages of IP design using UML.

Recommended sources and other learning resources/tools.

1. Стецюк М.В. Модель забезпечення живучості та відмовостійкості спеціалізованих інформаційних технологій в умовах руйнуючого впливу зловмисного програмного забезпечення / М.В. Стецюк, А.В. Горошко, Б.О. Савенко // Вимірювальна та обчислювальна техніка в технологічних процесах. – 2020. – № 1(65). – С. 97–103.
2. Яковина В.С. Основи теорії надійності програмних систем : навч. посіб. / В.С. Яковина, М.М. Сенів ; Нац. ун-т «Львівська політехніка». – Львів : Львів. політехніка, 2020. – 248 с.
3. Інформаційні технології та системи : монографія / В.П. Бурдаєв, О.Г. Руденко, О.О. Безсонов [та ін.] ; за заг. ред. В.С. Пономаренка ; Харк. нац. екон. ун-т ім. Семена Кузнеця. – Харків : ФОП Бровін О.В., 2020. – 173 с.
4. Литвин, В. В., Пасічник, В. В., Яцишин Ю.В. (2020). *Інтелектуальні системи*. Новий Світ – 2000. URL: http://surl.li/snorn

Planned learning activities and teaching methods. A combination of traditional and non-traditional teaching methods with the use of innovative technologies:
- lectures (thematic, problem-based – remote work);
- practical classes (traditional, individual work);
- seminar classes.

Assessment methods:
- current control (written questioning; verification of individual tasks);
- final control (credit).

Language of training. Ukrainian.

4.14. Course title. STATISTICAL METHODS OF ANALYSIS AND FORECASTING.

Type. Elective course.

Academic year. 2024/2026.

Lecturer, academic degree, rank, position. Motoryn R.M., Doctor of Sciences in Economics, Professor of the Department of Statistics and Econometrics.

Learning outcomes. Acquiring systemic knowledge and practical skills regarding the statistical analysis of the results of mass processes, the creation of mathematical and statistical models of the studied phenomena, the analysis of the correspondence of the created models to the studied processes, forecasting the development of processes, classification of objects, measurement of complex socio-economic categories, which will

allow testing the proposed scientific hypotheses and justify the obtained scientific conclusions.

Content. Methodological bases of statistical analysis and forecasting. Statistical estimation of parameters of mass processes and bases of the statistical conclusion. Statistical testing of hypotheses. Statistical modeling of the relationship between indicators and experimental results. Analysis of one-dimensional time series and their forecasting. Analysis and modeling of time series relationships. Panel data models. Statistical models of classification in scientific activity. Statistical models of latent variables in scientific research.

Recommended sources and other learning resources/tools.

1. Диха М. В. Економетрія / М.В. Диха, В. С. Мороз. – Київ : Центр навч. літ., 2019. – 206 с.
2. Козменко О. В. Економіко-математичні методи та моделі (Еконо-метрика) / О.В. Козменко, О.В. Кузменко. – Київ : Унів. кн., 2019. – 406 с.
3. Статистика : підручник / С.І. Пирожков, В.В. Рязанцева, Р.М. Моторин та ін. – Київ : Київ. нац. торг.-екон. у-т, 2020. – 328 с.
4. Oswald F, Viers V, Villedieu P, Kennedy G (2020). Introduction to Econometrics with R. SciencesPo Department of Economics, Paris, France. [Electronic resource]. – Available at**:** https:// scpoecon. github. io/ScPoEconometrics/
5. Hyndman, R.J., & Athanasopoulos, G. (2021) *Forecasting: principles and practice*, 2nd edition, OTexts: Melbourne, Australia. [Electronic resource]. – Available at**:** OTexts.com/fpp2.
6. Oswald F, Viers V, Villedieu P, Kennedy G (2020). Introduction to Econometrics with R. SciencesPo Department of Economics, Paris, France. [Electronic resource]. – Available at**:** https:// scpoecon. github. io/ScPoEconometrics/
7. Інтернет-сайт середовища програмування і пакетів статистичних програм і графіки R. – Режим доступу: http://www.r-project.org/

Planned learning activities and teaching methods.

Lectures, laboratory works based on real data using freely available programming environment and packages of statistical programs and R graphics.

Assessment methods:

- current control (tests, verification of laboratory work).
- final control (credit).

Language of training. Ukrainian.

4.15. Course title. INTERNATIONAL STATISTICS.

Type. Elective course.
Academic year. 2024/2026.
Lecturer, academic degree, rank, position. Motoryn R.M., Doctor of Sciences in Economics, Professor of the Department of Statistics and Econometrics.
Learning outcomes. Acquisition of systematic knowledge and skills of practical use of diverse and multifaceted information on the modern global system of planning and coordination of international statistical activities, recommendations on a common methodology for building international classifications and registers, international system of national accounts, methodological principles of international comparisons, joint international observations; ability to interpret and analyze the collected data to solve specific problems.
Content. The subject of international statistics. Modern global system of international statistics. International classifications and registers. International system of national accounts. Methodological principles of international comparisons.
Recommended sources and other learning resources/tools.
1. Моторин Р.М. Міжнародна статистика. Організація та методологія : підручник / Р.М. Моторин. – Київ : Київ. нац. торг.-екон. ун-т, 2019. – 456 с.
2. International DebtStatistics 2020. / The World Bank 1818 H Street NW, Washington DC 20433
3. Statistical Yearbook 2022, 65th issue, Series S, No. 41 Sales Number, E.22.XVII.14.H, 2022.
4. Державна служба статистики України. – Режим доступу : http://www.ukrstat.gov.ua
5. Статистичний комітет ООН. – Режим доступу : http://unstats.un.org/
Planned learning activities and teaching methods.
Lectures, laboratory work based on real data.
Assessment methods:
- current control (questioning, task verification, testing);
- final control (credit).
Language of training. Ukrainian.

4.16. Course title. WEB ANALYTICS.
Type. Elective course.
Academic year. 2024/2026.
Lecturer, academic degree, rank, position. Anton Tarasiuk, PhD, Assistant of the Department of Digital Economy and System Analysis.

Learning outcomes. Acquiring practical skills in collecting and analyzing data from websites, understanding and using various tools to collect and process data about user behavior on websites, including Google Analytics, Matomo, Hotjar. Interpretation of the main indicators of web analytics: attendance, conversions, bounce rate, time spent on the site. Using web analytics data to measure the effectiveness of advertising campaigns and optimize marketing strategies. Identifying problem areas on the site, improving usability, increasing conversion, optimizing content. Using web analytics data to improve your site's ranking in Google search results. Presentation of analysis results in the form of easy-to-understand reports and infographics.

Content. Definition of web analytics, its value, types of data collected, key metrics. Overview of popular web analytics tools, their functionality, comparison. Data collection methods, web analytics tool settings, filters and segmentation. Determination of key indicators, interpretation of results, creation of reports. Using web analytics to improve the website: Content optimization, usability, conversions, SEO optimization. Integration of web analytics with other systems: Integration with e-commerce systems, CRM systems, advertising platforms.

Recommended sources and other learning resources/tools.

1. Edmondson M. Learning Google Analytics. O'Reilly Media, Inc., 2022.
2. Лобода, Ю. Г. Сучасні інструменти аналізу даних за допомогою Google Analytics. Навчальний посібник К.: ВПЦ « Чорноморські студії» 2022.
3. Google Analytics Academy: https://analytics.google.com/analytics/academy/

Planned learning activities and teaching methods. A combination of classical and modern teaching methods with the use of innovative technologies: lectures (overview / thematic); seminar / practical classes.

Assessment methods:
- current control (questioning, testing, thematic reviews, discussion);
- final control (credit).

Language of training. Ukrainian.

4.17. Course title. STOCHASTIC MODELING.
Type. Elective course.
Academic year. 2024/2026.
Lecturer, academic degree, rank, position. Hamalii V.F., Doctor of Sciences (Physics and Mathematics), Professor, Professor of the Department of Digital Economy and System Analysis.

Learning outcomes. Mastering the terminology and conceptual apparatus of the researched scientific direction. Knowledge of stochastic programming methods. Practical ability to use the numerical (iterative) method for studying stochastic models.

Content. Basic concepts of the theory of stochastic processes. Characteristics of a random process. Classification of random processes. Stochastic models using homogeneous Markov chains. Mass service systems (MSS). Methods of stochastic programming. Stochastic models of production planning. Use of the numerical (iterative) method for the study of stochastic models.

Recommended sources and other learning resources/tools.

1. Погоруй А.О. Вступ до теорії випадкових процесів : навч. посіб. / А.О. Погоруй, О.А. Чемерис. – Житомир : ЖДУ ім. І. Франка, 2020. – 70 с.
2. Жлуктенко В.І. Стохастичні процеси та моделі в економіці, соціології, екології : навч. посіб. / В.І. Жлуктенко, С.І. Наконечний, С.С. Савіна. – Київ : КНЕУ, 2020. – 226с.
3. Гармаш О.В. Теорія випадкових процесів: Задачі для самостійної роботи : навч. посіб. / О.В. Гармаш. – Київ : КПІ ім. Ігоря Сікорського, 2021. – 44 с.
4. Лоєва І.Д. Методи теорії випадкових процесів : навч. посіб. / І.Д. Лоєва, Е.М. Сєрга, Є.П. Школьний. – Одеса : Одес. держ. еколог. ун-т, 2019. – 132 с.

Planned learning activities and teaching methods. A combination of traditional and non-traditional teaching methods with the use of innovative technologies: lectures (thematic, problem-based); practical classes (traditional, work in small groups, interactive online technologies).

Assessment methods:
- current control (testing, oral and written questioning, verification of practical and independent works);
- module test;
- final control (credit).

Language of training. Ukrainian.

4.18. Course title. ARTIFICIAL INTELLIGENCE.

Type. Elective course.

Academic year. 2024/2026.

Lecturer, academic degree, rank, position. Demidov P.H., Candidate of Technical Sciences, Associate Professor, Associate Professor of the Department of Computer Science and Information Systems.

Learning outcomes. Upon completion of this course, postgraduate students must: have the ability to abstract thinking, analysis and synthesis; form a systematic scientific worldview; know: the basic concepts of research in the field of computer science - artificial intelligence (AI), models of processing and presentation of knowledge, the principles of neural networks and different approaches to learning in neural networks, programming languages for artificial intelligence; be able to: apply theoretical and practical knowledge in scientific activities to solve problems in the subject area; design AI systems, expert systems, knowledge bases; use different teaching methods; develop computer programs in artificial intelligence languages to solve intellectual problems in economics.

Content. General characteristics of artificial intelligence. Basic concepts of AI. Review of applied areas of AI. Search for solutions of problems in the space of states. Logical models and method of resolutions. Calculus of statements. Basics of predicate calculus. Derivation rules in many predicates: modus ponens, resolution method and others. Unification.

Programming languages and technologies for artificial intelligence. PROLOG language syntax for predictive logic programming. Examples of solving problems in the PROLOG language. LISP programming. Examples of solving problems in LISP. Object-oriented programming using the CLOS language. Basic concepts of neural networks. Logic programming in VisualProlog. Artificial neural network modeling programs: Neural 10, NeuroPro, StatisticaNeuralNetworks and others.

Diagrams, graphs, categorical and Copycat architecture representing knowledge. Agent-oriented and distributed problem solving. The structure of agents, their distribution by functionality. Multiagent systems. Review of technology of expert systems (ES). Output in conditions of uncertainty, deductive and inductive output models. Machine learning: symbolic, based on connections, social and emergent principles. Problems of understanding natural language.

Recommended sources and other learning resources/tools.

1. Булгакова О.С. Методи та системи штучного інтелекту: теорія та практика: навч. посібник / О.С. Булгакова, В.В. Зосімов, В.О. Поздєєв – К.: Олді Плюс, 2020. – 356 с.
2. Ковальчук М. Л. Методи та системи штучного інтелекту: навч. посібник / М. Л. Ковальчук, Ю. О. Ушенко, Д. І. Угрин – Чернівці: Чернівецький національний університет ім. Ю. Федьковича, 2022. – 318 с.

3. Троцько В.В. Методи штучного інтелекту: навчально-методичний і практичний посібник / В.В. Троцько. - К.: Університет "КРОК", 2020. – 86 с.

Planned learning activities and teaching methods. Lectures, practical classes, independent work.

Assessment methods:
- current control (written questioning; verification of individual tasks);
- final control (credit).

Language of training. Ukrainian.

4.19. Course title. SCIENTIFIC RESEARCH METHODOLOGY.

Type. Elective course.

Academic year. 2024/2026.

Lecturer, academic degree, rank, position. Purskyi O.I., Doctor of Physical and Mathematical Sciences, Professor, Head of the Department of Computer Science and Information Systems.

Learning outcomes. The ability to carry out scientific research on modern issues in the field of computer science in accordance with the methodology of scientific research, methods of scientific knowledge, forms and methods of analysis, processing and synthesis of information, the ability to formulate a goal, determine the object, subject and tasks of one's own scientific research.

Content. Science and scientific research. Technology of scientific research. The theory of errors in a scientific experiment. Modeling in scientific research. Visualization of the results of scientific research. Scientific publications. Use of specialized publishing systems. Types of research work. Preparation of a thesis. Scientometrics as a criterion for evaluating the results of scientific activity.

Recommended sources and other learning resources/tools.

1. Самсонов В.В. Методологія наукових досліджень та приклади її використання: Навч. посібник. / Самсонов В.В., Сільвестров А.М., Тачиніна О.М. - К.:НУХТ, 2022. – 385 с.
2. Thomas C. George. Research Methodology and Scientific Writing / Thomas C. George. – Springer., 2021. – 637 p.
3. Методологія наукових досліджень Навчально-методичний посібник / автори: Котловий С.А., Павлик Н.П., Сейко Н.А., Ситняківська С.М. Житомир: Вид-во ЖДУ ім. І. Франка, 2023.- 89 с.

Planned learning activities and teaching methods. A combination of traditional and non-traditional teaching methods with the use of innovative technologies: lectures (thematic, problem-based); practical classes

(traditional, work in small groups, interactive online technologies, using computer technology).

Assessment methods:
- current control (testing, oral and written questioning, verification of practical and independent works);
- module test;
- final control (credit).

Language of training. Ukrainian.

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