Intellectual property for security systems

Specialty	**Institute**
125 Cybersecurity and information protection	Educational and Scientific Institute of Computer Science and Information Technology (320)
Educational program	**Department**
Cybersecurity	Cybersecurity (328)
Level of education	**Course type**
Bachelor's level	Profile training, Selective
Semester	**Language of instruction**
3	English

Lecturers and course developers

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Candidate of economic sciences, associate professor of the department of cybersecurity of National Technical University "Kharkiv Polytechnic Institute".

The author of more than 30 publications: of them 3 monographs in co-authorship and 1 handbook with a neck. Leading lecturer in the disciplines: "Intellectual property of security systems", "Legal regulation of cyber security", "Strategic communications in conditions of hybrid warfare", "Fundamentals of systems theory and system analysis".
Детальніше про викладача на сайті кафедри

General information

Summary

The educational discipline "Intellectual property of security systems" is an optional educational discipline. The study of the discipline is aimed at the acquisition by students of universal professional competences in the use of intellectual property objects in the activities of the enterprise.

Course objectives and goals

Mastering the necessary knowledge of the system of intellectual and industrial property in invention and patent-licensing activities, methodological foundations of the creation of objects of industrial property and engineering psychology, protection of patent rights, international cooperation in the field of intellectual property, copyright and related rights, as well as the system of patent information ; the ability to use regulatory and legal acts in practice to ensure legal protection of scientific and technical achievements and creative products, to conduct patent and information research in a certain field of technology, to find analogues and to issue an application for an object of industrial property.

Format of classes

Lectures, workshops, consultations, self-study. Final control - credit test.

Competencies

GC-2. Knowledge and understanding of the domain and understanding of the profession.

GC-5. Ability to search, process and analyze information.

GC-8. Ability to make decisions and act in accordance with the principle of inadmissibility of corruption and any other manifestations of dishonesty.

PC-2. Ability to use information and communication technologies, modern methods and models of information security and/or cyber security.

PC-5. The ability to ensure the protection of information processed in information and telecommunication (automated) systems for the purpose of implementing the established information and/or cyber security policy.

PC-8. Ability to carry out incident management procedures, conduct investigations, provide them with an assessment.

PC-10. Ability to apply methods and means of cryptographic and technical protection of information at objects of information activity.

PC-12. Ability to analyze, identify and evaluate possible threats, vulnerabilities and destabilizing factors to the information space and information resources in accordance with the established policy of information and/or cyber security.

Learning outcomes

LO-1. Apply knowledge of state and foreign languages in order to ensure the effectiveness of professional communication;

LO-2. Organize own professional activity, choose optimal methods and ways of solving complex specialized tasks and practical problems in professional activity, evaluate their effectiveness;

LO-3. Use the results of independent search, analysis and synthesis of information from various sources for the effective solution of specialized tasks of professional activity.

LO-4. Analyze, argue, make decisions when solving complex specialized tasks and practical problems in professional activity, which are characterized by complexity and incomplete determination of conditions, be responsible for the decisions made.

LO-5. Adapt under the conditions of frequent changes in the technologies of professional activity, to predict the final result.

LO-6. Critically understand the main theories, principles, methods and concepts in education and professional activity.

LO-7. Act on the basis of the legislative and regulatory framework of Ukraine and the requirements of relevant standards, including international ones in the field of information and/or cyber security.

LO-8. Prepare proposals for regulatory acts on ensuring information and/or cyber security.

LO-9. Implement processes based on national and international standards for detection, identification, analysis and response to information and/or cyber security incidents.

LO-10. Perform analysis and decomposition of information and telecommunication systems.

LO-11. Perform analysis of connections between information processes on remote computer systems.

LO-12. Develop threat and intruder models.

LO-13. Analyze projects of information and telecommunication systems based on standardized technologies and data transmission protocols.

LO-14. Solve the task of protecting programs and information processed in information and telecommunication systems by hardware and software tools and evaluate the effectiveness of the quality of the decisions made.

LO-15. Use modern hardware and software of information and communication technologies.

LO-16. Implement complex information security systems in the automated systems (AS) of the organization (enterprise) in accordance with the requirements of regulatory and legal documents.

LO-17. Ensure the processes of security and functioning of information and telecommunication (automated) systems based on practices, skills and knowledge, regarding structural (structural-logical) schemes, network topology, modern architectures and models of security of electronic information resources with a reflection of relationships and information flows, processes for internal and remote components.

LO-18. Use software and software-hardware complexes for the security of information resources.

LO-19. Apply theories and methods of protection to ensure information security in information and telecommunication systems.

LO-20. Ensure the functioning of special software to protect information from destructive software influences, destructive codes in information and telecommunication systems.

LO-21. Solve tasks of provision and support (including: review, testing, accountability) of the access control system according to the stated security policy in information and telecommunication (automated) systems.

LO-22. Solve the management procedures of identification, authentication, authorization of processes and users in information and telecommunication systems according to the established policy of information and/or cyber security.

LO-23. Implement measures to prevent unauthorized access to information resources and processes in information and telecommunication (automated) systems.

LO-24. Solve the problems of managing access to information resources and processes in information and telecommunication (automated) systems based on access management models (mandatory, discretionary, role-based).

LO-25. Ensure the introduction of accountability of the access management system to electronic information resources and processes in information and telecommunication (automated) systems using event registration logs, their analysis and stated protection procedures.

LO-26. Implement measures and ensure the implementation of processes of prevention of unauthorized access and protection of information, information and telecommunication (automated) systems based on the reference model of interaction of open systems.

LO-27. Solve problems of data flow protection in information and telecommunication (automated) systems.

LO-28. Analyze and evaluate the effectiveness and level of security of resources of various classes in information and telecommunication (automated) systems during tests in accordance with the established policy of information and/or cyber security.

LO-29. Evaluate the possibility of realization of potential threats of information processed in information and telecommunication systems and the effectiveness of the use of complexes of protection means under the conditions of realization of threats of various classes.

LO-30. Assess the possibility of unauthorized access to elements of information and telecommunication systems.

LO-31. Apply protection theories and methods to ensure the security of elements of information and telecommunication systems.

LO-32. Solve the tasks of managing the processes of restoring the regular functioning of information and telecommunication systems using backup procedures in accordance with the stated security policy.

LO-33. Solve the problems of ensuring the continuity of business processes of the organization on the basis of risk management theory.

LO-34. Participate in the development and implementation of an information security and/or cyber security strategy in accordance with the goals and objectives of the organization.

LO-35. Solve the tasks of providing and supporting complex information security systems, as well as countering unauthorized access to information resources and processes in information and information-telecommunication (automated) systems in accordance with the stated policy of information and/or cyber security.

LO-36. Detect dangerous signals of technical means.

LO-37. Measure the parameters of dangerous and interfering signals during the instrumental control of information security processes and determine the effectiveness of information security against leakage through technical channels in accordance with the requirements of regulatory documents of the technical information security system.

LO-38. Interpret the results of special measurements using technical means, monitoring the characteristics of information and telecommunication systems in accordance with the requirements of regulatory documents of the technical information security system.

LO-39. Carry out attestation (based on accounting and survey) of regime territories (zones), premises, etc. under the conditions of compliance with the secrecy regime, recording the results in the relevant documents.

LO–40. Interpret the results of special measurements using technical means, control of ITS characteristics in accordance with the requirements of regulatory documents of the technical information security system.

LO-41. Ensure the continuity of the event and incident logging process based on automated procedures.

LO-42. Implement processes of detection, identification, analysis and response to information and/or cyber security incidents.

LO-43. Apply national and international regulatory acts in the field of information security and/or cyber security to investigate incidents.

LO-44. Solve the problems of ensuring the continuity of the organization's business processes on the basis of risk management theory and the stated information security management system, in accordance with national and international requirements and standards.

LO-45. Apply early classes of information security and/or cyber security policies based on risk-based access control to information assets.

LO-46. Analyze and minimize the risks of information processing in information and telecommunication systems.

LO-47. Solve the problems of protection of information processed in information and telecommunication systems using modern methods and means of cryptographic protection of information.

LO-48. Implement and maintain intrusion detection systems and use cryptographic protection components to ensure the required level of information security in information and telecommunications systems.

LO-49. Ensure the proper functioning of the monitoring system of information resources and processes in information and telecommunication systems.

LO-50. Ensure the functioning of software and software-hardware complexes for detecting intrusions of various levels and classes (statistical, signature, statistical-signature).

LO-51. Maintain operational efficiency and ensure configuration of intrusion detection systems in information and telecommunication systems.

LO-52. Use tools for monitoring processes in information and telecommunication systems.

LO-53. Solve problems of software code analysis for the presence of possible threats.

LO-54. Be aware of the values of a civil (free democratic) society and the need for its sustainable development, the rule of law, the rights and freedoms of a person and a citizen in Ukraine.

Student workload

The total volume of the course is 120 hours (4 ECTS credits): lectures - 32 hours, workshops- 16 hours, self-study - 72 hours.

Course prerequisites

"Jurisprudence".

Features of the course, teaching and learning methods, and technologies

In the course of teaching the discipline, the teacher uses explanatory-illustrative (informational-receptive) and reproductive teaching methods. Presentations, conversations, and master classes are used as teaching methods aimed at activating and stimulating the educational and cognitive activities of applicants.

Program of the course

Topics of the lectures

Topic 1. The concept of intellectual property and the system of its legal protection.
Tasks of the academic discipline. The structure and content of the discipline, its connection with other disciplines. Concept of intellectual activity and its result. Functions of civil law regarding the protection and use of the results of intellectual activity and means of individualization equated to them. Reflection in the general rules of civil law features of intellectual activity and its results. Special institutes of civil law mediating intellectual activity and its results. Interrelation of special institutes of civil law mediating intellectual activity and its results.
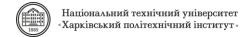
Topic 2. Legal nature of intellectual property rights.
The concept of intellectual property, the relationship between intellectual property rights and property rights. Legal nature of intellectual property. Legal protection of intellectual property. Objects of intellectual property rights. Subjects of intellectual property law. Intellectual property and obligation law. The concept of ownership and use.

Topic 3. Basic institutions of intellectual property law.
Terms. Copyright and related rights. Patents and related concepts. Means of individualization of goods and services. Non-traditional results of intellectual activity.

Topic 4. Concepts and signs of the object of copyright.

Concept of copyright object. Signs of the object of copyright. The value of the work. Legal significance of individual elements of the work. Works that are objects of copyright. Works that are not objects of copyright.

Topic 5. Subjects of copyright. Authors' rights.
Primary and derivative subjects of copyright. Subjects of copyright according to law and contract. Domestic and foreign citizens as subjects of copyright. The authors of the work. Occurrence of copyright in the creator of the work. Translators as subjects of copyright. Co-authorship. Other subjects of copyright. Authors' rights. Personal non-property rights of authors. Property rights of authors. Copyright term.

Topic 6. Transfer of property copyrights.
Disposal of property copyrights. Copyright agreement. Related rights. Executor's rights. Collective management of copyright and related rights. Mechanism of creation, functions and duties of collective rights management organizations.

Topic 7. Protection of copyright and related rights.
Violation of copyright and related rights. Jurisdictional form of protection of copyright and related rights. Ways of civil protection of copyright and related rights. Administrative and criminal liability for violation of copyright and related rights.

Topic 8. General concepts of law and its systems. Concept, subject and principles of patent law.
General concepts of law and its system. Subject and principles of patent law.

Topic 9. The system of sources of patent law and its connection with civil, administrative, economic and criminal law.
System of sources of patent law. Multilateral international treaties in the field of industrial property, to which Ukraine is a party. Bilateral international agreements of Ukraine on cooperation in the field of industrial property protection.List of normative acts of Ukraine in the field of protection of intellectual property rights. Patent law and its relationship with civil, administrative, economic and criminal law.

Topic 10. Objects of patent law.
Objects of the invention (utility model). Concepts and features of the invention (utility model). Novelty, concept of prior art, priority and order of its establishment, novelty benefit, inventive step, industrial applicability. Basic requirements for objects of patent law.

Topic 11. Subjects of patent law.
Authors of inventions, utility models, industrial designs. Rights and obligations of patent owners. Service inventions. Rights and obligations of heirs. Purpose, structure and tasks of the patent office in Ukraine. Intellectual property representatives (patent attorneys).

Topic 12. Protection of rights to objects of industrial property. Ways of protecting rights.
Patent as a form of protection of industrial property objects. Content of patent rights. Ways of protecting patent rights to an invention (utility model, industrial design).

Topic 13. International system of protection of industrial property objects.
The main tasks and principles of the World Intellectual Property Organization. Agreements providing protection of industrial property. Paris Convention on the Protection of Industrial Property. Basic principles. Washington Treaty on Intellectual Property Regarding Integrated Circuits. Agreement on Laws Concerning Trademarks. Agreements that make it easier to obtain industrial property protection in several countries and affirm international classifications.

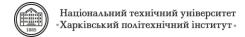Topic 14. Registration of patent rights in foreign countries.
Registration of patent rights in Ukraine. Registration of patent rights in foreign countries. Patenting of inventions in accordance with the requirements of various patent conventions. Patenting of inventions in accordance with the requirements of the Patent Cooperation Treaty (PCT). Patenting of inventions in accordance with the requirements of the European Patent Convention (EPC). Patenting of inventions in accordance with the requirements of the Eurasian Patent Convention (EAPC).

Topics of the workshops

Topic 1. Rules for drawing up and submitting an application for an invention and an application for a utility model.
Topic 2. Details of the current accounts of the examination institution - SE "Ukrpatent", to which fees are paid for actions related to the protection of rights to intellectual property objects.
Topic 3. Carrying out a search for legal acts confirming intellectual property rights. A computer program is a special object of copyright.

Topic 4. Carrying out a search for legal acts confirming intellectual property rights. Introduction of programs into economic circulation.
Topic 5. Means of individualization.

Topics of the laboratory classes

Not provided for in the curriculum.

Self-study

A student's independent work is one of the forms of organization of learning, the main form of mastering educational material in free time from classroom training. During independent work, students study lecture material, do individual homework, prepare for tests, tests and exams. Students are also recommended additional materials (videos, articles) for self-study and analysis.

Non-formal education

Within the framework of non-formal education, according to the relevant Regulation (http://surl.li/pxssv), the educational component or its individual topics may be taken into account in the case of independent completion of professional courses/trainings, civic education, online education, vocational training, etc.
Subjects are not considered for this component in case of successful completion of the courses.

Course materials and recommended reading

Basic literature:

1. Website of the World Intellectual Property Organization (WIPO)
https://www.wipo.int/portal/en/index.html
2. State Enterprise "Institute of Intellectual Property" // [Electronic resource].
Access mode: https://ukrpatent.org/uk
3. Popova L.M. Intellectual property: textbook / L.M. Popova., A.V. Khromov, I.V. Fur coat: Kharkiv, "Fedorko", 2021, p. 262.
https://fpk.in.ua/images/biblioteka/3bac_pravo/Book_2021_Popova_Intelektualna_vlasnist.pdf
4. On copyright and related rights: Law of Ukraine, version dated April 15, 2023, No. 2811-IX.
https://zakon.rada.gov.ua/laws/show/2811-20#n855
5. Synergy of building cybersecurity systems: monograph / S. Yevseiev, V. Ponomarenko, O. Laptiev, O. Milov and others. - Kharkiv: PC TECHNOLOGY CENTER, 2021. - 188 p.
https://drive.google.com/drive/u/1/folders/1wOTN8N-GBGO06AnvjQHU1SdBl3xCaUju
6. Models of socio-cyber-physical systems security: monograph / S. Yevseiev, Yu. Khokhlachova, S. Ostapov, O. Laptiev and others. - Kharkiv: PC TECHNOLOGY CENTER, 2023. - 168 p.
https://drive.google.com/drive/u/1/folders/1wOTN8N-GBGO06AnvjQHU1SdBl3xCaUju
7. Modeling of security systems for critical infrastructure facilities: monograph / S. Yevseiev, R. Hryshchuk, K. Molodetska, M. Nazarkevych and others. - Kharkiv: PC TECHNOLOGY CENTER, 2022. - 196 p.
https://drive.google.com/drive/u/1/folders/1wOTN8N-GBGO06AnvjQHU1SdBl3xCaUju.

Additional literature:

8. On amendments to some legislative acts of Ukraine regarding strengthening the protection of intellectual property rights: Law of Ukraine, version of March 20, 2023 No. 2974-IX.
https://zakon.rada.gov.ua/laws/show/2974-20#Text
9. On the protection of rights to inventions and utility models: Law of Ukraine, version of December 31, 2023 No. 3687-XII.
https://zakon.rada.gov.ua/laws/show/3687-12#Text.

Assessment and grading

Criteria for assessment of student performance, and the final score structure

Points are awarded according to the following ratio:
• workshops: 30% of the semester grade;
• independent work: 10% of the semester grade;
• control work: 20% of the semester grade;
• credit test: 40% of the semester grade

Grading scale

Total points	National	ECTS
90–100	Excellent	A
82–89	Good	B
75–81	Good	C
64–74	Satisfactory	D
60–63	Satisfactory	E
35–59	Unsatisfactory (requires additional learning)	FX
1–34	Unsatisfactory (requires repetition of the course)	F

Norms of academic integrity and course policy

The student must adhere to the Code of Ethics of Academic Relations and Integrity of NTU "KhPI": to demonstrate discipline, good manners, kindness, honesty, and responsibility. Conflict situations should be openly discussed in academic groups with a lecturer, and if it is impossible to resolve the conflict, they should be brought to the attention of the Institute's management.

Regulatory and legal documents related to the implementation of the principles of academic integrity at NTU "KhPI" are available on the website: http://blogs.kpi.kharkov.ua/v2/nv/akademichna-dobrochesnist/

Approval

Approved by	Date, signature		Head of the department
	28.08.2024		Serhii YEVSEIEV
	Date, signature 28.08.2024		Guarantor of the educational program Serhii YEVSEIEV

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