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ФИО: Ястребов Олег Александрович  
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**Federal State Autonomous Educational Institution of Higher Education  
Peoples' Friendship University of Russia named after Patrice Lumumba**

**Academy of Engineering**

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(name of the main educational unit (MEU) that developed the educational program of higher education)

## **WORKING PROGRAM OF THE DISCIPLINE**

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### **INTRODUCTION TO THE SPECIALTY**

(name of discipline/module)

**Recommended for the field of study/specialty:**

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### **27.03.04 CONTROL IN TECHNICAL SYSTEMS**

(code and name of the field of study/specialty)

**The discipline is mastered within the framework of the implementation of the main professional educational program of higher education (EP HE):**

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### **DATA SCIENCE AND SPACE SYSTEMS**

(name (profile/specialization) of the educational institution of higher education)

## 1. THE GOAL OF MASTERING THE DISCIPLINE

The course "Introduction to the Specialty" is part of the bachelor's degree program "Data Science and Space Systems" in the 27.03.04 "Control in Technical Systems" program and is studied in the first semester of the first year. The course is offered by the Department of Mechanics and Control Processes. It consists of three sections and 12 topics and focuses on the fundamentals of professional activity, as well as the main trends in the development of intelligent systems and cybersecurity systems.

The purpose of mastering this discipline is to familiarize students with the history of the emergence of information technology, cybersecurity systems and individuals, an overview of the current state of this industry, and an overview of the main trends in the development of the professional industry.

## 2. REQUIREMENTS FOR THE RESULTS OF MASTERING THE DISCIPLINE

Mastering the course "Introduction to the Specialty" aimed at developing the following competencies (parts of competencies) in students:

*Table 2.1. List of competencies developed in students while mastering the discipline (results of mastering the discipline)*

Cipher	Competence	Indicators of Competency Achievement (within this discipline)
UC-1	Able to search, critically analyze and synthesize information, and apply a systematic approach to solving assigned tasks	UC-1.1 Analyzes the task, identifying its basic components; UC-1.2 Defines and ranks the information required to solve the given problem; UC-1.3 Searches for information to solve a given problem using various types of requests; UC-1.4 Works with scientific texts, distinguishes facts from opinions, interpretations, assessments and substantiates his conclusions using philosophical conceptual apparatus; UC-1.5 Analyzes and contextually processes information to solve assigned tasks while forming one's own opinions and judgments; UC-1.6 Suggests options for solving the problem, analyzes the possible consequences of their use; UC-1.7 Analyzes ways of solving problems of ideological, moral and personal nature based on the use of basic philosophical ideas and categories in their historical development and socio-cultural context;
UC-6	Able to manage one's time, build and implement a trajectory of self-development based on the principles of lifelong learning	UC-6.1 Controls the amount of time spent on specific activities; UC-6.2 Develops tools and methods for time management when completing specific tasks, projects, and goals; UC-6.3 Analyzes one's resources and their limits (personal, situational, temporary, etc.) for the successful completion of the assigned task; UC-6.4 Finds and uses sources of additional information to improve the level of general and professional knowledge; UC-6.5 Analyzes the main opportunities and tools of continuous education in relation to one's own interests and needs, taking into account conditions, resources, personal capabilities, stages of career growth, time perspective for the development of activities and the requirements of the labor market; UC-6.6 Defines the tasks of self-development, goals and priorities of professional growth; UC-6.7 Distributes tasks into long-, medium- and short-term ones with justification of their relevance and analysis of resources for their implementation;

### 3. PLACE OF THE DISCIPLINE IN THE STRUCTURE OF THE EDUCATIONAL EDUCATIONAL INSTITUTION

Course "Introduction to the Specialty" refers to the mandatory part of block 1 "Disciplines (modules)" of the educational program of higher education.

As part of the higher education program, students also master other disciplines and/or practices that contribute to the achievement of the planned results of mastering the discipline "Introduction to the Specialty".

*Table 3.1. List of components of the educational program of higher education that contribute to the achievement of the planned results of mastering the discipline*

<b>Cipher</b>	<b>Name of competence</b>	<b>Previous courses/modules, practical training*</b>	<b>Subsequent disciplines/modules, practices*</b>
UC-1	Able to search, critically analyze and synthesize information, and apply a systematic approach to solving assigned tasks		<i>Business Ethics**;</i> <i>Sociology**;</i> <i>Cultural Studies**;</i> Philosophers; Jurisprudence; Research work / Scientific research work; Technological Training; Undergraduate Training;
UC-6	Able to manage one's time, build and implement a trajectory of self-development based on the principles of lifelong learning		<i>Fundamentals of Engineering Economics and Management;</i> <i>Psychology and Pedagogy;</i> <i>Philosophers;</i> <i>Fundamentals of Project Activities;</i> <i>Fundamentals of Artificial Intelligence;</i> <i>Physical Education;</i> <i>Research work / Scientific research work;</i> <i>Technological Training;</i> <i>Undergraduate Training;</i>

\* - filled in accordance with the competency matrix and the SUP EP HE

\*\* - elective courses/practices

#### 4. SCOPE OF THE DISCIPLINE AND TYPES OF EDUCATIONAL WORK

The total workload of the course “Introduction to the Specialty” is 2 credit units.

*Table 4.1. Types of educational work by periods of mastering the educational program of higher education for full-time education.*

Type of academic work	TOTAL,academic hours		Semester(s)
			1
<i>Contact work, academic hours</i>	36		36
Lectures (LC)	0		0
Laboratory work (LW)	0		0
Practical/seminar classes (SC)	36		36
<i>Independent work of students, academic hours</i>	36		36
<i>Control (exam/test with assessment), academic hours</i>	0		0
<b>Total complexity of the discipline</b>	<b>academic hours</b>	<b>72</b>	<b>72</b>
	<b>credit</b>	<b>2</b>	<b>2</b>

## 5. CONTENT OF THE DISCIPLINE

Table 5.1. Content of the discipline (module) by types of academic work

Section number	Name of the discipline section	Topic Title		Topic Contents	Type of academic work*
Section 1	Introduction to the specialty	1.1	The purpose, objectives, and structure of the course (introduction to the key values of the industry and profession for the development of science, economics, and society; a brief overview of the sections and topics of the course, work formats during the semester, literary sources; explanations of the BRS)	Course goals and objectives: Introduction to the key values of the information technology industry and professions in this field, as well as their role in the development of science, economics, and society. A brief overview of the course sections and topics, and a description of the semester's work formats (lectures, practical classes, independent work) are provided. A review of recommended literature and course materials is provided. An explanation of the point-rating system for academic assessment is provided.	SC
		1.2	The history of the origin and development of information technology and cybersecurity systems (the main stages of the development of the industry and profession in Russia and the world)	Key stages in the development of information technology and cybersecurity in Russia and globally. The emergence of the first computing systems. The evolution of information security threats. The development of methods and tools for information security. The contribution of domestic and international schools to the development of the field.	SC
		1.3	Professional landscape (where and in what positions graduates of the educational program in "Management in Technical Systems" work; the functionality of activities in the specialty in different positions; basic terms and definitions in the profession)	An overview of the jobs and typical positions of graduates in the "Management of Technical Systems" program. The job descriptions cover various positions, from engineer to department manager. Key terms and concepts of the profession include information security, information protection, technical systems management, and cyber resilience.	SC
		1.4	Requirements of modern employers from the IT industry for the level of training of graduates (requirements of professional standards, requirements for the "hard" and "soft" skills of graduates; norms of professional ethics, corporate culture and social responsibility)	Analysis of professional standards for specialists in technical systems management and information security. Hard skills requirements include knowledge of security systems, programming languages, and administrative tools. Soft skills requirements include communication skills, teamwork, and analytical thinking. Standards of professional ethics, corporate culture, and social responsibility are also addressed.	SC
		1.5	The trajectory of higher education in IT professions (overview of the structure and procedure for mastering the educational program; the trajectory and principles of developing graduate competencies; an overview of key disciplines and practices of the educational	The structure and process of mastering the bachelor's/specialist's degree program. Individual learning paths and principles for developing graduate competencies. An overview of key curriculum disciplines and elective courses. The types and content of educational and industrial internships. Opportunities for participation in research.	SC

Section number	Name of the discipline section	Topic Title		Topic Contents	Type of academic work*
			program; relationships with related industries and specialties)		
Section 2	Outstanding leaders of the profession and their contributions to the industry	2.1	Russian "pioneers" in the field of IT and cybersecurity	The lives and work of outstanding Russian scientists and engineers who laid the foundations of computing, information theory, and information security. Their contributions to the creation of the first computers, communication systems, algorithmic support, and cryptographic methods. Historical examples of solving complex technical problems.	SC
		2.2	Contemporary Russian leaders in IT and cybersecurity	A review of the work of leading Russian specialists, IT company executives, and heads of research schools in the fields of cybersecurity and technical systems management. Their role in developing the industry, creating innovative products, and training personnel.	SC
		2.3	Students meet with a prominent Russian IT industry leader	Organizing and hosting a meeting with an invited expert—an executive or leading specialist from an IT company, a representative from the scientific community, or a government agency. Discussing current issues in the industry's development, career paths, and requirements for young professionals.	SC
Section 3	Current state and development trends in the industry. Mechanisms and tools for professional development.	3.1	The current state and main development directions of the IT industry in Russia and worldwide.	An analysis of the current state of the information technology and cybersecurity industry. Key trends: digital transformation of the economy, import substitution, development of artificial intelligence, the Internet of Things, and cloud technologies. Government support programs for the IT industry.	SC
		3.2	Innovation and digitalization in the IT industry	The concept of innovation in information technology. Examples of breakthrough technologies: big data, distributed ledgers, biometric authentication, quantum communications. The impact of digitalization on industry, management, and the social sphere.	SC
		3.3	An overview of labor markets in Russia and around the world; possible career paths: science and education, business, the public sector, etc.	The IT and cybersecurity labor market structure. In-demand specialties and salaries. Possible career paths: research and teaching, business (corporate sector, startups), government service and defense industry, independent consulting.	SC
		3.4	Soft skills for professional success	A list of key soft skills required for a specialist in technical systems management and cybersecurity: critical thinking, systems thinking, effective communication, teamwork, time management, self-learning ability, stress tolerance, and decision-making in non-standard situations. Ways to develop these skills during and outside of	SC

Section number	Name of the discipline section	Topic Title	Topic Contents	Type of academic work*
			training.	

\* - to be completed only for FULL-TIME education: LC – lectures; LW – laboratory work; SC – practical/seminar classes.

## 6. LOGISTIC AND TECHNICAL SUPPORT OF DISCIPLINE

Table 6.1. Material and technical support for the discipline

Audience type	Equipment of the auditorium	Specialized educational/laboratory equipment, software and materials for mastering the discipline (if necessary)
Lecture	A lecture hall equipped with specialized furniture, a whiteboard (screen), and multimedia presentation equipment.	Projector
Seminar	An auditorium for conducting seminar-type classes, group and individual consultations, ongoing monitoring and midterm assessment, equipped with a set of specialized furniture and technical means for multimedia presentations.	
For independent work	A classroom for independent student work (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to the Electronic Information System.	

\* - the classroom for independent work of students MUST be indicated!

## 7. EDUCATIONAL, METHODOLOGICAL AND INFORMATIONAL SUPPORT OF THE DISCIPLINE

### Main literature:

1. They say IT pays well, E. Pravdina, Bombora Publishing House, p. 384, 2021. ISBN 978-5-04-119275-4
2. How Computers Really Work, Justice Matthew, DMK Press, p. 428, 2022. ISBN 978-5-97060-973-6

### Further reading:

1. Pages of the history of domestic IT / Comp. E.M. Proydakov. - M.: Alpina Publisher, 2015. Vol. 1. - 2015. - 265 p. ISBN 978-5-9614-4853-5
2. History of IT Business 1990s, Krotov N., Fedorov A.

### Resources of the information and telecommunications network "Internet":

1. RUDN University Electronic Library System and third-party electronic library systems to which university students have access based on concluded agreements
  - RUDN University Electronic Library System – RUDN University Electronic Library System <https://mega.rudn.ru/MegaPro/Web>
  - Electronic Library System "University Library Online" <http://www.biblioclub.ru>
  - EBS "Urayt" <http://www.biblio-online.ru>
  - Electronic Library System "Student Consultant" [www.studentlibrary.ru](http://www.studentlibrary.ru)
  - EBS "Knowledge" <https://znanium.ru/>
2. Databases and search engines
  - Sage <https://journals.sagepub.com/>
  - Springer Nature Link <https://link.springer.com/>
  - Wiley Journal Database <https://onlinelibrary.wiley.com/>
  - Scientometric database Lens.org <https://www.lens.org>

*Educational and methodological materials for independent work of students in mastering a discipline/module\*:*

1. Lecture course on the subject "Introduction to the specialty".

\* - all teaching and methodological materials for independent work of students are posted in accordance with the current procedure on the discipline page in TUIS!

**DEVELOPER:**

Associate Professor

*Position, DEPARTMENT*

*Signature*

Saltykova Olga  
Alexandrovna

*Surname I.O.*

**HEAD OF THE DEPARTMENT:**

Head of Department

*Position of the DEPARTMENT*

*Signature*

Razumny Yuri Nikolaevich

*Surname I.O.*

**HEAD OF THE EP HE:**

Head of Department

*Position, DEPARTMENT*

*Signature*

Razumny Yuri Nikolaevich

*Surname I.O.*