Ministry of Education and Science of Ukraine
National Aerospace University
«Kharkiv Aviation Institute»

Department of Computer Systems, Networks and Cybersecurity (№ 503)

APPROVED

Educational Programme Guarantor

(signature) Ievgen BABESHKO
(First name and LAST NAME)

« 31 » August 2025

SYLLABUS OF COMPULSORY ACADEMIC DISCIPLINE

Pre-Graduation Practical Training
(name of the academic discipline)

Field of knowledge: F «Information Technologies»
(code and name of the field of knowledge)

Speciality: F7 «Computer Engineering»
(code and name of the speciality)

Educational and Professional Programme: «System Programming»
(name of the educational programme)

Level of higher education: **Second (Master's)**

Syllabus effective from 01.09.2025

Kharkiv – 2025

Developer(s): Uzun D.D., Prof. _____
(surname and initials, position, academic degree and title) (signature)

The syllabus of the academic discipline was reviewed at the Department meeting of Computer Systems, Networks and Cybersecurity
(name of the department)

Minutes No. 1 dated « 29 » August 2025

Head of Department Prof. _____ Viacheslav KHARCHENKO
(academic degree and title) (signature) (First name and LAST NAME)

Agreed with the student representative:

_____ Polina OHARKO
(signature) (First name and LAST NAME)

1. General Information about the Instructor

Full name: Uzun Dmytro

Position: Professor

Academic degree: Candidate of Technical Sciences

Academic title: Associate Professor

List of disciplines taught:

DevOps Technologies
Operating Systems
Cloud Security Technologies
DevSecOps Technologies
Cybersecurity Domains
DevOps and Cloud Technologies

Research areas:

Implementation of modern technologies for automating the development cycle and ensuring the security posture of IT projects

Contact information:

d.uzun@khai.edu

2. Description of the Academic Discipline

Form of education	Full-time
Semester	3
Language of instruction	English
Type of discipline	Compulsory
Course volume: ECTS credits / number of hours	10 ECTS credits / 300 hours (0 contact hours, of which: lectures – 0, labs – 0; individual work – 300)
Types of learning activities	Individual work
Types of assessment	Ongoing assessment – pass/fail
Prerequisites	Scientific and Pedagogical Training

3. Objectives and Tasks of the Academic Discipline, Lists of Competencies and Expected Learning Outcomes

Objective – acquisition and consolidation of skills for independent research and engineering-technical work in production and research teams of enterprises and organisations.

Tasks – consolidation of theoretical knowledge and skills, mastery of research and experimentation methodology in real practical conditions of specialists at this level, development of creative abilities, ability to apply acquired knowledge in practice, collection of materials necessary for the completion of the master's qualification thesis.

Competencies acquired:

General Competencies (GC):

– GC2. Ability to think abstractly, analyse and synthesise.

– GC4. Ability to search for, process and analyse information from various sources.

– GC5. Ability to generate new ideas (creativity).

– GC6. Ability to identify, pose and solve problems.

Professional Competencies (PC):

– PC1. Ability to determine the technical characteristics, design features, application and operation of software, software-hardware

– tools, computer systems and networks of various purposes.

– PC9. Ability to present the results of own research and/or developments in the form of presentations, scientific and technical reports, articles and papers at scientific and technical conferences.

– PC10. Ability to identify, classify and describe the operation of software-hardware tools, computer systems, networks and their components;

– PC11. Ability to select effective methods for solving complex computer engineering problems, critically evaluate the results obtained and justify decisions made.

Programme Learning Outcomes (PLO):

– PLO2. To find necessary data, analyse and evaluate them.

– PLO6. To analyse the problem area, identify and formulate specific

– problems requiring solution, and choose effective methods for their resolution.

– PLO8. To apply knowledge of technical characteristics, design features, purpose and operating rules of software-hardware tools of computer systems and networks to solve complex computer engineering problems and related issues.

– PLO10. To search for information in various sources to solve computer engineering problems, and analyse and evaluate this information.

– PLO12. To communicate freely both orally and in writing in Ukrainian and one foreign language (English, German, Italian, French, Spanish) when discussing professional issues, research and innovations in the field of information technologies.

4. Content of the Academic Discipline

MODULE 1
Content Module 1.

Topic 1. Introduction

Brief annotation: Completing a safety briefing at the start of the practical training. Familiarisation with the practical training objectives and programme, receiving the assignment.

Individual work: Processing material in the pre-graduation practical training report.

Topic 2. Research and Analysis of the Subject Domain

Brief annotation: Investigation of subject domain specifics. Identification of motivation for the thesis/project topic direction. Justification of the relevance of the thesis/project topic. Analysis and selection of approaches/measures for software development in accordance with the thesis/project topic.

Individual work: Research into the characteristics of the subject area. Identification of motivation regarding the direction of the thesis/project topic.

Topic 3. Software Design and Development

Brief annotation: Software requirements specification. Selection of data structure and development of algorithm and software implementation for solving the individual assignment.

Individual work: Development of algorithms and their software implementation.

MODULE 2
Content Module 2.

Topic 4. Software Testing

Brief annotation: Testing software code using modern approaches and tools.

Individual work: Creating test suites for verifying the developed software.

Topic 5. Software Documentation

Brief annotation: Use of tools for generating software documentation. Formatting reports in accordance with DSTU and other specified requirements.

Individual work: Processing material in the pre-graduation practical training report.

Topic 6. Presentation

Brief annotation: Creation of electronic presentations.

Individual work: Creating a presentation, delivering a report at the pre-graduation practical training report defence.

5. Individual Assignments

Not provided

6. Teaching Methods

Individual work of students using relevant materials (Sections 11, 12).

7. Assessment Methods

Ongoing assessment, final assessment in the form of a pass/fail grade based on the pre-graduation practical training report.

8. Assessment Criteria and Score Distribution, received by students

Table 8.1 – Score distribution received by students

Components of academic work	Total number of points
Practical training report	0…70
Illustrative part	0…20
Work defence	0…10
Total	0..100

Table 8.2 – Assessment scales: point-based and traditional

Total points	Grade on the traditional scale	
	Exam	Pass/fail
90 – 100	Excellent	Passed
75 – 89	Good	
60 – 74	Satisfactory	
0 – 59	Unsatisfactory	Failed

Assessment criteria for student work

Satisfactory (60–74) – Demonstrate minimum knowledge and skills, complete the main practical training programme.

Good (75–89) – Have a firm command of the minimum, complete the full practical training programme, demonstrate a sufficient level of self-organisation and initiative.

Excellent (90–100) – Demonstrate confidence, organisation and

conscientious attitude to assigned dut'ies, complete the full pre-graduation practical training programme, and complete the practical training report in a timely and proper manner.

9. Course Policy

Compliance with academic integrity requirements by students during the study of the academic discipline. During the study of the academic discipline, students must comply with generally accepted moral and ethical norms and rules of conduct, academic integrity requirements stipulated by the Academic Integrity Policy of the National Aerospace University «Kharkiv Aviation Institute» (https://khai.edu/polozenna-pro-akademicnu-dobrocesnist). Students' works are expected to be their original research. Failure to cite sources, fabrication of sources, plagiarism, and interference with the work of other students constitute, but are not limited to, examples of possible academic dishonesty. Detection of academic integrity violations in a student's written work is grounds for it not being credited by the instructor.

Conflict Resolution. The procedure and processes for resolving conflicts are governed by the Code of Ethical Conduct at the National Aerospace University «Kharkiv Aviation Institute» (https://khai.edu/kodeks-etiki).

10. Methodological Support

1. Discipline page in the distance learning system «Mentor» [Electronic resource]. URL: https://mentor.khai.edu/course/view.php?id=3703

11. Recommended Literature

Core

1. A. Yu. Berko et al. Organisation of Scientific Research, Writing and Defence of a Master's Dissertation: Teaching guide. Lviv: «Novyi Svit-2000», 2020. 282 p.
2. Handbook for Degree Candidates: Collection of normative documents and information materials on the attestation of highly qualified scientific personnel. 5th ed. / Compiled by Yu.I. Tsekov. Kyiv, 2011. 69 p.
3. Sheiko V.M., Kushnarenko N.M. Organisation and Methodology of Research Activity: Textbook. 6th ed. Kyiv: Znannia-Pres, 2008. 310 p.
4. Rusalovskyi A. V. Legal and Organisational Issues of Labour Protection: Study guide. 5th ed., suppl. and rev. Kyiv: University «Ukraine», 2011. 295 p.
5. Azarenkov V. I. Presentation. Design. Speech: study guide for higher education students / V. I. Azarenkov, O. V. Olkhovska. Poltava: PUET, 2023. 107 p.

Supplementary

1. Kennedy D., Matthews D. Powerful Presentations. Kyiv: Fabula. 2023. 208 p.

12. Information Resources

1. Master Thesis Database [Electronic resource]. URL: https://euipo.europa.eu/knowledge/mod/data/view.php?id=13258