Національний технічний університет України
«КИЇВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ
імені ІГОРЯ СІКОРСЬКОГО»

Department of Radio Engineering Systems

[RE-189] HUAWEI TELECOMMUNICATION NETWORKS

Curriculum of the academic discipline (Syllabus)

Course details

Level of higher education	First (bachelor's)
Field of knowledge	G - Engineering, manufacturing, and construction
Specialty	G5 - Electronics, electronic communications, instrument engineering, and radio engineering
Educational program	All
Discipline status	Elective (F-catalog)
Form of higher education	Full-time
Year of training, semester	Available for selection starting from the 3rd year, fall semester
Scope of the discipline	4 credits (Lectures 16 hours, Practical 0 hours, Lab 30 hours, Independent work 74 hours)
Semester Control/control measures	Credit
Class schedule	https://schedule.kpi.ua
Language of instruction	Ukrainian / English
Information about the course director / teachers	Lectures: Myronchuk O. Yu., Lab: Myronchuk O. Yu., Independent work: Myronchuk O. Yu.
Course location	

Curriculum

1. Description of the course, its purpose, subject matter, and learning outcomes

The purpose of the discipline is to acquire knowledge about data transmission networks, understand the basic concepts and principles of data transmission networks, and acquire practical skills in designing and maintaining networks.

After studying the discipline, students will:

- understand concepts related to data transmission networks;

- be able to describe information transmission processes;

- be familiar with the types of modern networks and their topologies;

- be able to classify network devices and know their basic functions;

- be able to configure equipment, design networks, and maintain them.

2. Prerequisites and post-requisites of the discipline (place in the structural-logical scheme of training under the relevant educational program)

Required knowledge and skills:

- user-level proficiency with personal computers;

- understanding of the basic principles of computer technology;

- knowledge of number systems used in computing (decimal, binary, hexadecimal);

- basic level of English proficiency not lower than A2.

3. Course content

List of topics

1. Fundamentals of data transmission networks
2. Reference network model
3. Basics of Huawei VRP
4. Network-level protocols and IP addressing
5. Basics of IP routing
6. OSPF Fundamentals
7. Ethernet Switching Basics
8. VLAN construction and configuration principles
9. Principles and configuration of STP
10. Communication between VLANs
11. Eth-Trunk, iStack, CSS
12. ACL principles and configuration
13. Principles and configuration of AAA
14. Network address translation
15. Network services and applications
16. WLAN Overview
17. WAN Technologies
18. Network Management, Operation, and Maintenance
19. IPv6 basics
20. SDN and NFV Overview
21. Network programmability and automation
22. Typical architectures and practical aspects of campus network design

4. Training materials and resources

The discipline is taught within the framework of the memorandum of cooperation between Igor Sikorsky KPI and Huawei. The course uses Huawei's HCIA-Datacom course materials, which the instructor distributes to students during the first class and which are available on the Huawei Talent portal. For in- depth study of specific issues, it is recommended to review the following literature:

Organization of Computer Networks [Electronic resource]: textbook: for students majoring in 121 "Software Engineering" and 122 "Computer Science" / Igor Sikorsky KPI; Yu. A. Tarnavsky, I. M. Kuzmenko. – Electronic text data (1 file: 45.7 MB). – Kyiv: Igor Sikorsky Kyiv Polytechnic Institute, 2018. – 259 p.

Educational content

5. Methodology for mastering the academic discipline (educational component)

Lectures

Lecture 1: Fundamentals of data transmission networks. Reference network model. Lecture 2: Network layer protocols and IP addressing.

Lecture 3: Network address translation Lecture 4: Network services and applications Lecture 5: Overview of WLAN

Lecture 6: WAN technologies

Lecture 7: Network management, operation, and maintenance Lecture 8: Network programmability and automation

Lecture 9: Typical architectures and practical aspects of building campus-type networks

Laboratory classes

Lab 1: Huawei VRP Basics

Lab 2: IP Routing Basics

Lab 3: OSPF Basics

Lab 4: OSPF Basics

Lab 5: Ethernet Switching Basics

Lab 6: Ethernet Switching Basics

Lab 7: Principles of VLAN Construction and Configuration

Lab 8: Communication Between VLANs

Lab 9: Principles and Configuration of STP

Lab 10: Principles and Configuration of STP

Lab 11: Eth-Trunk, iStack, CSS

Lab 12: Eth- Trunk, iStack, CSS

Lab 13: ACL Principles and Configuration

Lab 14: AAA Principles and Configuration

Lab 15: Network Address Translation

Lab 16: WLAN Overview

Lab 17: IPv6 Fundamentals

Lab 18: SDN and NFV Overview

6. Independent Student Work

Independent work involves consolidating knowledge of the material studied in lectures and lab sessions by working through the main and additional literature provided.

Policy and control

7. Academic discipline (educational component) policy

Class attendance rules

Lectures: attending classes according to the schedule; studying the material independently, remotely, using the materials provided or on the Huawei Talent portal, is also permitted.

Laboratory work: attending classes according to the schedule. During laboratory work, there may be situations when a student does not have time to complete the work during the class. In this case, it must be completed independently at home using the simulator program or on laboratory equipment during additional time allocated by the teacher.

8. Types of control and rating system for assessing learning outcomes

Current assessment: completion of laboratory work, computational and graphical work, writing a modular test.

Calendar assessment: conducted twice per semester as monitoring of the current status of syllabus requirements.

Semester assessment: test.

The student's rating score for the semester is determined by the results of completing up to 10 laboratory assignments and a modular test. Two laboratory classes are allocated for completing laboratory assignments 1-8. One laboratory class is allocated for completing laboratory assignments 9-10. The maximum score for a laboratory assignment is 4. Thus, during the semester, a student can earn 40 points for completing laboratory work. The maximum score for a modular test is 60. The modular test is conducted in the form of a test at the end of the semester. Successful completion of laboratory work is considered to be obtaining at least 60% of the maximum score for which the work is assessed. For applicants who have fulfilled all the conditions for admission to the exam and have a rating of less than 60 points, as well as for those applicants who wish to improve their rating, the teacher conducts a semester test in the form of a credit test during the last scheduled class of the semester. The condition for admission to the test is the completion of all assignments that were performed during the semester. The test is conducted in the form of a test with an additional task on the practical application of the knowledge gained. In this case, the previous rating is canceled and the result of the test determines the final test score.

Table of correspondence between rating points and grades on the university scale

Number of points	Grade
100-95	Excellent
94	Very good
84	Good
74-65	Satisfactory
64-60	Sufficient
Less than 60	Unsatisfactory
Conditions for admission not met	Not admitted

9. Additional information about the discipline (educational component)

Students studying the discipline register on the Huawei Talent portal at Igor Sikorsky KPI ICT Academy. The portal offers the opportunity to view and listen to material in English. After studying the discipline, the most successful students have the opportunity to receive a voucher free of charge and take an online exam at Huawei to obtain an HCIA-Datacom certificate.

Description of material, technical, and information support for the discipline

Huawei software and equipment

Work program for the course (syllabus):
Compiled by Myronchuk O. Yu.;
Approved by the RTS Department (Minutes No. 06/2025 dated 06/24/2025)
Approved by the methodological commission of the faculty/research institute (protocol No. 06/2025 dated 26.06.2025)