SYLLABUS OF THE EDUCATIONAL DISCIPLINE
Computer Networks

Component of the educational program – mandatory (4.0 credits)

Educational and professional program	Information Technologies and Project Management
Specialty	122 – Computer Science
Field of knowledge	12 – Information Technologies
Level of higher education	first (bachelor's)
Language of instruction	Ukrainian
Instructor profile	Oleksandr Matvii Associate Professor of the Department of Mathematical Modeling, PhD in Physical and Mathematical Sciences, Associate Professor http://matmod.fmi.org.ua/pro-kafedru/spivrobitnyky/matviy-oleksandr-vasylyovych/
Contact phone number	+38037-258-48-25
E-mail:	o.matviy@chnu.edu.ua
Course page in Moodle	https://moodle.chnu.edu.ua/course/view.php?id=3861
Consultations	Monday, 16:00 – 16:30, Room 17

ANNOTATION OF THE EDUCATIONAL DISCIPLINE

Introductory course for studying the fundamentals of designing and organizing computer networks. The main objectives of the discipline "Computer Networks" are to study the general principles and standards of building and functioning of computer networks.

Within this discipline, students will become familiar with the technical aspects of building computer networks, the main data transmission protocols, the architecture of network devices, and the tools for monitoring and managing the network. Furthermore, the study of this discipline will help students acquire skills in planning, configuring, and administering computer networks.

The aim of the educational discipline is to prepare students for professional activities in the field of information technology, where they will be able to successfully design, deploy, and manage computer networks in various organizations. The main objectives include:

- mastering the fundamental principles of building computer networks and their functioning;
- acquiring knowledge about network technologies and data transmission protocols;
- training in the planning and configuration of network equipment;
- familiarizing students with the basics of designing, configuring, managing, and operating computer networks using the Cisco Packet Tracer software for modeling computer networks;

- skills in administering computer networks, including diagnosing issues and resolving them.

EDUCATIONAL CONTENT OF THE COMPONENT

	MODULE 1 FUNDAMENTALS OF COMPUTER NETWORKS
TOPIC 1	General concepts of computer networks and their classification. Fundamentals of computer network topology.
TOPIC 2	Standards in the field of computer networks. Fundamentals of computer network organization.
TOPIC 3	The OSI reference model. The TCP/IP model and protocol stack.
TOPIC 4	Physical and data link layer of the computer network.
TOPIC 5	Ethernet technology. MAC addresses. CSMA/CD access method.
TOPIC 6	Switched Ethernet. Ethernet switches.
TOPIC 7	Fundamentals of Wi-Fi technology. Access to the medium in Wi-Fi technology. Wi-Fi services.
	MODULE 1 Administration of a computer network based on the TCP/IP protocol stack
TOPIC 8	Network layer. Network layer protocols.
TOPIC 9	IP protocol and fundamentals of routing.
TOPIC 10	Classful and classless addressing. IP addresses.
TOPIC 11	Organization of static and dynamic routing.
TOPIC 12	Control protocols of the network layer.
TOPIC 13	Fundamentals of Virtual Local Area Networks (VLANs).
TOPIC 14	Transport layer. Application of transport layer protocols.
TOPIC 15	Application layer. Key services of the application layer.

FORMS, METHODS, AND EDUCATIONAL TECHNOLOGIES OF TEACHING

Teaching methods:
- verbal methods (lecture, discussion, debate, explanation, storytelling, etc.);
- practical methods (laboratory sessions);
- visual methods (demonstration, illustration);
- working with information resources: educational and methodological literature, regulatory documents, and internet resources;
- independent work on individual assignments or according to the curriculum of the educational discipline;
- distance learning using appropriate online platforms (Moodle and Google Meet).

FORMS AND METHODS OF CONTROL AND ASSESSMENT

Current assessment

Forms of current assessment include oral and/or written responses (testing, laboratory work, individual assignments) from the student.

Assessment tools

Oral assessment in the form of individual and group questioning during lectures and laboratory sessions, defense of laboratory work, and individual research assignments; written assessment in the form of tests and final testing surveys.

Final assessment – exam.

CRITERIA FOR ASSESSING LEARNING OUTCOMES

Assessment of the educational program outcomes for students is conducted using the European Credit Transfer and Accumulation System (ECTS) grading scale.

The criterion for successful assessment is the achievement of minimum threshold levels (points) by the higher education student for each planned learning outcome.

The final grade is based on the total points earned in the content modules during the semester and in the final module (exam/credit).

POLICY ON ACADEMIC INTEGRITY

Adherence to the policy on academic integrity by participants in the educational process during the study of the educational discipline is regulated by the following documents:

✔ "Ethical Code of Chernivtsi National University named after Yuriy Fedkovych" https://www.chnu.edu.ua/media/jxdbs0zb/etychnyi-kodeks-chernivets koho-natsionalnoho-universytetu.pdf

✔ "Regulations on the Detection and Prevention of Academic Plagiarism at Chernivtsi National University named after Yuriy Fedkovych" https://www.chnu.edu.ua/media/n5nbzwgb/polozhennia-chnu-pro-plahiat-2023plusdodatky-31102023.pdf

INFORMATION RESOURCES

1. https://moodle.chnu.edu.ua/course/view.php?id=3861
2. Комп'ютерні мережі: методичні рекомендації та завдання для лабораторних робіт. Укл.: Олександр Матвій, Ігор Черевко – Чернівці: Чернівецький національний університет, 2023. – 72 с. https://archer.chnu.edu.ua/xmlui/handle/123456789/10099
3. Матвій О.В. Основи комп'ютерних мереж: навчальний посібник / Матвій О.В., Мельник В.С., Черевко І.М. – Чернівці : Чернівецький національний університет ім. Юрія Федьковича, 2024. – 158 с. https://archer.chnu.edu.ua/xmlui/handle/123456789/10326