

Syllabus of the educational discipline

«COMPUTER SYSTEMS»

<i>Cycle of Higher Education</i>	<i>First cycle of higher education (Bachelor's degree)</i>
<i>Field of Study</i>	<i>12 Information Technologies</i>
<i>Specialty</i>	<i>123 Computer engineering</i>
<i>Educational program</i>	<i>Computer systems and networks</i>
<i>Discipline status</i>	<i>Normative</i>
<i>Teaching language</i>	<i>English</i>
<i>Year of studies, semester</i>	<i>3 year (6 semester)</i>
<i>Number of credits ECTS</i>	<i>3 credits</i>
<i>Distribution by types of trainings and hours of study</i>	<i>Lectures, Laboratory studies, Independent training</i>
<i>Form of final assessment</i>	<i>Exam</i>
<i>Teacher</i>	<i>Korol Yu.Yu., associate professor of the department of computer systems and network</i>
<i>Teacher's contacts</i>	<i>yuriy.korol@uzhnu.edu.ua</i>
<i>Course Schedule</i>	<i>According to the timetable</i>

The purpose of studying the discipline "Computer Systems" is to provide students with basic knowledge of computer systems. The acquired knowledge of this discipline will allow the application of classical and modern methods of rational and effective usage of computer technology in practical work.

As a result of studying the discipline the student must:

know:

- basic terms and definitions of computer systems;*
- basic trends in the development of computer hardware, including computer systems;*
- basic structures of computer systems;*
- how to design and use modern computer systems*

be able to:

- model the temporal characteristics of computer systems and networks; analyze the effectiveness of technical solutions*
- correctly set tasks, give a comparative characteristic of various solutions at the stages of designing computer systems.*

Prerequisites for learning

Programming, Organization and Functioning of Computers, System Programming

Content of the educational discipline

- Topic 1.** Introduction to Computer Systems
- Topic 2.** Computer generation
- Topic 3.** Evolution of microprocessors
- Topic 4.** The smallest computers
- Topic 5.** Personal computers
- Topic 6.** Collaborative Computers
- Topic 7.** Supercomputers
- Topic 8.** Fundamentals of computer system classification
- Topic 9.** Flin classification and its extension
- Topic 10.** Other classifications of computer systems
- Topic 11.** Superscalar Organization of Computing
- Topic 12.** Reduced Instruction Set Computers
- Topic 13.** Symmetric multiprocessor systems
- Topic 14.** NUMA multiprocessor system
- Topic 15.** PVP architecture
- Topic 16.** Computer clusters
- Topic 17.** MPP architecture
- Topic 18.** Types of communication networks

Topic 19. Static communication network topologies
Topic 20. Bus-based dynamic communication networks
Topic 21. Switching Dynamic Communication Networks
Topic 22. Cache memory
Topic 23. Data integrity in memory
Topic 24. MESI protocol

Course page on the Moodle platform (personal training system)	<i>Syllabus of the educational discipline, hyperlinks to electronic publications of the discipline, recommended literature, students' attendance, lecture materials, presentations, questions for self-control, methodical materials for laboratory works, tests, tasks for checking students' knowledge.</i> https://moodle.uzhnu.edu.ua
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Recommended literature

1. *David Money Harris Digital Design and Computer Architecture.* - Morgan Kaufmann; 2nd edition. 2012. - 720p.
2. *Sarah L. Harris, David Harris Digital Design and Computer Architecture, RISC-V Edition: RISC-V Edition.* - Morgan Kaufmann; 1st edition, 2021. - 592p.
3. *Jim Ledin Modern Computer Architecture and Organization: Learn x86, ARM, and RISC-V architectures and the design of smartphones, PCs, and cloud servers.* - Packt Publishing; Illustrated edition, 2020. - 560p.

Assessment system of learning outcomes

The ECTS grade that a student receives after studying a credit module of a discipline is determined according to the student's rating. A student's credit module rating consists of the points the student receives during the semester for the following types of work:

1. *Modular control work (MCW) duration of 2 acad. hours each. The maximum number of points for the MCW is 40 points.*
2. *Performance of laboratory works.*

During the semester, students perform laboratory works (maximum number of points - 50)

Scores on individual and independent work of students are awarded for: preparation of essays, modernization of tasks, creative approach to task performance, performance of tasks to improve didactic materials on the discipline: 0-10 points for each module.

Each module is assessed a maximum of 100 points. At the end of the discipline a rating score is derived as the arithmetic average of the points from the two modules.

ECTS and national grading scale

Mark scale	ECTS	Exam	Test
90 - 100	A	Excellent	Satisfied
82 - 89	B	Good	
74 - 81	C		
64 - 73	D	Satisfactory	
60 - 63	E		
35 - 59	FX	“Unsatisfactory” with possibility to pass the exam again	“Not satisfied” with possibility to pass the exam again
1 - 34	F	“Unsatisfactory” with obligatory repeated study of the discipline	“Not satisfied” with obligatory repeated study of the discipline