# Syllabus of the educational discipline
# «ORGANIZATION AND FUNCTIONING OF COMPUTERS»

| | |
|---|---|
| ***Cycle of Higher Education*** | *First cycle of higher education (Bachelor's degree)* |
| ***Field of Study*** | *F Information Technologies* |
| ***Specialty*** | *F7 Computer engineering* |
| ***Educational program*** | *Computer systems and networks* |
| ***Discipline status*** | *Normative* |
| ***Teaching language*** | *English* |
| ***Year of studies, semester*** | *1 year (1 semester)* |
| ***Number of credits ECTS*** | *3 credits* |
| ***Distribution by types of trainings and hours of study*** | *Lectures, Laboratory studies, Independent training* |
| ***Form of final assessment*** | *Test* |
| ***Teacher*** | *Voitovich B. V., assistant lecturer of department of computer systems and networks* |
| ***Teacher's contacts*** | *bohdan.voitovych@uzhnu.edu.ua* |
| ***Course Schedule*** | *According to the timetable* |

The purpose of the discipline "Organization and Functioning of Computers" is to give fundamental knowledge about computer software and operating systems, and to study of the functional capabilities of hardware and software components of personal computers (PC) and computer networks. At the end of this course, students should:

*know:*

- basics of processors, processor types, the company manufacturers of microprocessors;
- features of work different types of computer buses and their use, the basic characteristics of motherboards and characteristics of basic blocks placed on the board;
- basic types of storage devices and their characteristics, manufacturing technology for various types of memory;
- basic BIOS settings, working with RAID arrays;
- identify the characteristics of video and audio adapter and basic characteristics of monitors, types of monitors.

*be able to*

- using theoretical and practical knowledge for working with PC ;
- debug the hardware and software errors of computers and computer systems.

**Prerequisites for learning**

High School Informatics Course

**Content of the educational discipline**

**Module 1**

**Topic 1.** History of PC.
**Topic 2.** Components of a PC, its capabilities and structure of the system.
**Topic 3**. Microprocessor Types And Specifications.
**Topic 4.** Motherboard.
**Topic 5.** Types of busses in computer architecture.
**Topic 6.** BIOS: basic input-output.
**Topic 7.** Memory.
Modular control work

**Module 2**

**Topic 8.** Interface ATA/IDE.
**Topic 9.** Magnetic data storage devices.
**Topic 10.** Hard drives.
**Topic 11.** Storage on removable media.
**Topic 12.** Optical storage devices.
**Topic 13.** Video adapters.
**Topic 14.** Monitors.

**Topic 15.** Audio devices.
Modular control work
Test

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

**Recommended literature**


1. *Slater, R. Portraits in Silicon, Cambridge, MA: M.I.T. Press, 1987.*
2. *Bechini, A., Conte, T.M., and Prete, Ñ A. Opportunities and Challenges in Embedded Systems, IEEE Micro Magazine, vol. 24, pp. 8-9, July-Aug. 2004.*
3. *Henkel, J., Hu, X.S., and Bhattachatyya, S.S. Taking on the Embedded System Challenge, IEEE Computer Magazine, vol. 36, pp. 35-37, April 2003.*
4. *Weiser, M. The Computer for the 21st Century, IEEE Pervasive Computing, vol. 1, pp. 19-25, Jan.-March 2002; originally published in Scientific American, Sept. 1991.*
5. *Lutz,J., and Hasan, A. High Performance FPGA based Elliptic Curve Cryptographic Co-Processor, Proc. Int'l Conf. on Inf. Tech.: Coding and Computing, IEEE, pp. 486-492, 2004*
6. *Saha, D., and Mukherjee, A. Pervasive Computing: A Paradigm for the 21st Century, IEEE Computer Magazine, vol. 36, pp. 25-31, March 2010.*


**Assessment system of learning outcomes**

*Current control carried out the semester and evaluated by the amount of points (max is 100 points). A minimum amount, that allows a student to get credit is 35 (max is 100 points).*

*The student's rating ($R_s$) in the course consists of points that he/she receives for defended laboratory exercises ($R_1$) and the modular control work($R_2$): $R_s=R_1+R_2=100$ points. As a result, the maximum average weight score in each module is equal to: 4 laboratory exercises x 10 points = 40 points, modular control work = 60 points*

*Each module is rated at a maximum of 100 points. At the end of the discipline displayed rating score, which is defined as the arithmetic mean of two modules.*

*The students whose overall points at the end of the semester are more or equal to 60 points can:*

*− get their final grade according to the rating system;*

*− pass a final test in order to increase the grade.*

*Final (semester) control is carried out in the form of exam and evaluated in points (max is 100 points, min is 35 points).*

**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 |