SYLLABUS

INTERNATIONAL EUROPEAN UNIVERSITY

BUSINESS ARS EST

EUROPEAN SCHOOL OF BUSINESS

Computer architecture
Educational program «Software engineering»

2024

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1	Name of the course and educational program

Computer architecture
Educational program "Software engineering"

2	Course description

The study of the discipline "Computer Architecture" contributes to the formation of the scientific level of thinking of the future specialist contains a theoretical base that considers the modern principles of building the main functional units of a computer: the control unit and the arithmetic-logic unit of the central processing unit, the computer memory and the unifying system bus. This theoretical base is necessary when mastering applied design issues of both single-processor computers and multiprocessor computing systems of universal and specialized purpose. The main emphasis in the course is on the construction of computer nodes with von Neumann architecture, the study of the modern foreign elemental base and the basics of technology and means of designing computer nodes.

3	Study prerequisites

Expanding students' knowledge regarding the study of the arithmetic, logical, informational and architectural foundations of building computers and computer systems of various levels, the purpose and principles of operation of the main modules.
Computer Architecture is closely related to the educational disciplines "Software Quality and Testing", "Software Architecture and Design".

4	Amount of credits/hours

4 ECTS credits/ 120 hours

5	Training format

Blended learning

6	Classroom location

Audience 405. https://dist.ieu.edu.ua/course/view.php?id=630

7	Information about the teacher

Boris Shevchuk, Ph.D., associate professor of the Department of Information Technologies

8	Department

Department of Information Technologies

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9	Office location

Kyiv, Akademika Glushkova Ave., 42 B, room 505

10	Schedule of counseling

Every Tuesday from 12:00 to 16:00 with prior appointment via corporate mail

11	E-mail of the teacher

borys _ shevchuk @ieu.edu.ua

12	Course objectives

Study of the general structure and principles of PC operation, study of the structure, main technical characteristics and principles of operation of the main structural elements of a PC and acquisition of knowledge on the construction of computer hardware, mastering the organization and effective maintenance and repair of main components of a PC and peripheral devices, acquisition of practical skills working with hardware of computer systems and computer technologies.

13	The role of academic discipline in achieving program results

PR07. Know and apply in practice the fundamental concepts¨, paradigms and basic principles of the functioning of linguistic, instrumental and computational means of engineering¨software.
PR08. Be able to develop a human-machine interface.
PR15. Motivated to choose programming languages and development technologies to solve the tasks of creating and maintaining software.

14	Learning outcomes

Know:
- basic concepts of the architecture of electronic computing machines;
- principles of the structure of individual devices of computing systems;
- processes that occur during the management of basic devices;
- theoretical principles of increasing the efficiency and productivity of computer systems;
- basic hardware maintenance technologies.

Be able:
- conduct research on methods of using modern computer and information and communication tools;
- explore the types and parameters of hardware and software of a personal computer;
- perform simple maintenance of computer systems;
- create educational projects based on system architecture and computer technologies;
- work with technical literature. Systematize and analyze various technical information.

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15	Course content

Content module I. CONSTRUCTION AND HARDWARE COMPOSITION OF IVM RS
Topic 1. Origin of personal computers. Types of computer architectures
Topic 2. Types and specifications of microprocessors
Topic 3. System boards and buses
Topic 4. RAM
Topic 5. ATA/IDE, SATA interface
Content module II. PC PERIPHERAL DEVICES
Topic 6. Serial, parallel and other input/output interfaces
Topic 7. Power supply units and cases of personal computers
Topic 8. Magnetic data storage devices. Accumulators on hard disks
Topic 9. Accumulators with removable media. Flash media are optical data storage devices
Topic 10. Video adapters and monitors. Audio devices. Network equipment
Topic 11. Information input and output devices. Scanners and printers.

16	Course materials and requirements

1. Zubkov S.V. Assembler for DOS, Windows and Unix . - 5th ed ., ed . and additional - M.: DMK, 2012.
2. Watermelon S. IN. Computer architecture. Peculiarities of using computers in IS: teaching . help - Kh. : Khneu, 2015. – 256 p.
3. Matvienko M. P. Computer architecture: teach . help for studies higher teach app . / M. P. Matvienko, V. P. Rosen , O. M. Depository - K. : Lira, 2013. – 264 p.
4. Workshop on the use of information technology: educational and methodological manual. Ch. 1 / T.M. Slaboshevska , I.M. Smekalin , S.M. Yashanov; in general edited by S.M. Yashanova ; Ministry of Education and Science, Youth and Sports of Ukraine , National ped. University named after M. P. Drhagomanova . – K.: Publishing house of the M. NPU. P. Drgahomanova , 2012. – 130 p.
5. Workshop on the use of information technology: educational and methodological manual. Ch. 2 / T.M. Slaboshevska , I.M. Smekalin , S.M. Yashanov; in general edited by S.M. Yashanova ; Ministry of Education and Science, Youth and Sports of Ukraine , National ped. University named after M. P. Drhagomanova . – K.: Publishing house of the M. NPU. P. Drgahomanova , 2012. – 113 p.
6. Sokolovskyi Y.I., Pirko I.B., Kens I.R., Dendyuk M.V., Yatsyshyn S.I. Computer circuitry. Study guide. " Computing " series , - Lviv: "Magnolia - 2006", 2017.
7. Shevchuk B.V., Shevchuk L.D. Repair and modernization of a personal computer: educational and methodological manual. Pereyaslav-Khmelnytskyi: Ya.M. Dombrovska, 2019. 350 p.
8. Yashanov S.M. Workshop on educational Internet technologies: Educational and methodological manual. - K.: NPU, 2010. - 487 p.
9. Yashanov S.M., Shevchuk B.V. Architecture of computer systems. Laboratory practicum for students who obtain the "Bachelor's" certificate in the specialty "Professional education. Computer technologies" with the qualification "Teacher of professional training. Specialist in information technologies". Kyiv: Publishing House of the NPU named after M.P. Drahomanova, 2017. 106 p

17	Technical requirements for working on the course

To work on the Human-Machine Interaction course, you need regular access to a computer and the Internet.

In order to successfully study and pass the exam from the training course, you need to constantly familiarize yourself with the materials posted on the university's remote platform (Moodle) in the Human-Machine Interaction course. You also need to create reporting documents for the performance of laboratory work and upload them to the platform. You can use the remote platform only from your corporate mail account.

If it is impossible to access the platform or the course, you must notify the dean's office or the headmaster, or the course instructor directly.

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18	Learning process

The process of studying the course " Computer Architecture" includes lectures and laboratory sessions.
During the lectures, such teaching methods as lecture, lecture-conversation, discussion, discussion of problematic issues, demonstration, and analysis of various situations will be used according to the topic of the lectures.
During laboratory classes, such teaching methods as surveys, testing, performance of individual tasks, performance of analytical and calculation works, solved specific problems and situations will be used).

19	Signs of discipline

Term of teaching	Semester	International Disciplinary integration	Course study	Cycles: general training/ professional training/ free choice
1 semester	5th semester	No	3ty course	Cycle of professional training

20	Evaluation policies

You will have different ways to demonstrate your knowledge and skills throughout the semester. This includes how you attend class, how and what you contribute to topic discussions, how you complete and complete lab assignments and tests on time, how you complete independent work assignments, and the ability to present your work. In addition, it is possible to perform tasks that are performed individually or in a small group in the form of a student scientific work.

Activities during the semester	Maximum number of points during the semester
Performing laboratory work (16 units)	33
Performing independent work	14
Performance of individual work	10
Total current work	**60**
Exam	**40**
TOTAL	**100**

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The grade for the discipline is defined as the sum of the points scored for the current activity in the semester. Each module includes an assessment score for the student's current work. Module control activities are carried out upon completion of the study of the taught material of this module. The minimum number of points for the current educational activity, which allows the discipline to be counted as completed, must be at least 60. The maximum point for the discipline is 100.

The total grade for studying the discipline is set according to the national and European scale (EKTS).

The overall final grade in points, according to the national scale and according to the ECTS scale, is entered in the student's assessment and examination information, study card and student's assessment book.

Rating scale: national and ECTS

The sum of points for all types of educational activities	Evaluation ECTS	Evaluation on a national scale	
		for an exam, course project (work), practice	for credit
90-100	A	perfectly	
82-89	B	good	Enrolled
74-81	C		
66-73	D	satisfactorily	
60-65	E		
30-59	FX	unsatisfactory with possibility reassembly	not counted with the possibility of retaking
1-29	F	unsatisfactory with mandatory repeated sstudy of the discipline	not enrolled with mandatory repeated study of the discipline

To check your assignment grades and read the teacher's comments, you need to check the relevant tabs on the distance learning platform (Moodle) in this course.

You can also get information about the received grades in the joint chat of the subject group (Viber or Telegram) or directly from the course instructor via corporate mail, messengers or by appointment on the days of consultations.

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23	Course policies

For the productive educational and cognitive activity of the applicants when studying the discipline, thematic lectures are held and practical classes are conducted in the form of laboratory works.

In classes and during his stay at the university, the student must treat teachers, staff and other students with respect, attend classes according to the schedule, come on time and not leave the classroom without the teacher's permission. It is necessary to complete all academic tasks and their work within the specified time.

The teacher, in turn, must constantly raise his professional level, pedagogical skill, general culture, provide conditions for students to master educational programs at the level of mandatory requirements for the content, level and scope of education, promote comprehensive professional development of students. It is mandatory to follow the educational and thematic plan, not to be late for classes, not to allow any manifestations of corruption, discrimination, bullying, harassment and oppression of the rights of those seeking education.

Education is based on the application of active learning methods. Active participation is expected and the norm. Attendance and active participation make up 80% of the grade. A student who, for good reasons, documented, was not subject to current control has the right to undergo current control within a two-week period after returning to studies.

A student who was absent from classes without valid reasons, did not participate in current control activities, did not liquidate academic debt, is not allowed to take the final semester control of knowledge in this discipline, and on the day of the exam in the examination information by a scientific and pedagogical employee the grade "not admitted" is issued. Retaking the exam in the discipline is prescribed on the condition that all types of educational, independent (individual) work provided for in the work curriculum of the discipline are performed, and is carried out in accordance with the liquidation schedule approved by the directorate.

The academic integrity of any institution of higher education requires integrity in teaching and research, so academic integrity is required of all MEU students. Academic dishonesty is prohibited in all programs at our university. All participants in the educational process are guided by the principles of academic integrity.

24	Completing the task late, correcting grades, working out

Assignment reports must be uploaded to Moodle by the due dates specified in the course schedule. Best practice would be to complete assignments as soon as possible after receipt to allow enough time to actively participate in class. If more time is needed to complete the task, flexible deadlines are available. Completed assignments are accepted for full credit until the last class in the discipline on the schedule, after which 40% partial credit based on the grade received will be awarded within a week of the last day of class. Assignments that were not submitted at all will receive 0.

If classes are missed for more than one week due to illness or other reasons, it is necessary to contact the teacher to agree on alternative options for completing tasks. Deadlines work both ways, and meeting them ensures that your instructor provides timely feedback on your assignments to ensure you stay on course.

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25	Teacher's response time (about checking assignments)

Via corporate mail (within 24 hours), via messengers (within 1-2 hours).

26	Effective communication

Effective communication is essential to success in this course, we recommend using the following channels:
Forum of questions and answers: for general course questions, you need to check the FAQ section in Moodle and then post your question in the Q&A forum to ask your colleagues or the instructor (guaranteed to receive a notification by e-mail every time a new publication or an answer to a question appears);
E-mail: have a personal question related to studying the course, write to the teacher directly;
Social networks, messengers: personal communication with classmates, teacher;
Face-to-face meeting: communication with classmates during classes and with the teacher on consultation days.

27	Policy of publication and distribution of course materials

Students may not post, publish, sell, or otherwise publicly distribute course materials without written Permission the teacher. Such materials include: lecture notes, slides (presentations) of lectures, video or audio recordings, tasks, problem sets, tests, other students' works and answers, etc. Students who sell, post, publish, or distribute course materials without written permission or otherwise may be subject to disciplinary action, up to and including withdrawal.
The use of generative AI is permitted subject to adherence to the principles of academic integrity.

28	Expected workload and involvement of students

Approximately 2-3 hours per week should be allocated to work in this course. If circumstances arise that force you to spend more time on one of the tasks, you must inform the teacher by e-mail (messenger).
An extension of the submission deadline is possible only under the condition that the teacher is informed in advance that it is impossible to submit the assignment by the specified time. Students are expected to have a backup plan in case of computer malfunctions or Internet outages.

29	Support services

Electronic schedule: https://rozklad.ieu.edu.ua
Online library: https://onlinelibrary.ieu.edu.ua
Repository: https://sed.ieu.edu.ua/index.php/sed/index
Educational Ombudsman: https://ieu.edu.ua/pro-mieu/ombudsmen

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Topic name	Content of practical class

Topic 1. Origin of personal computers. Types of computer architectures	1. Control on lectures
	  2. Laboratory work 1 - Safety techniques when working with a PC. Structure of a personal computer
	  3. Questions submitted for independent study - Creating an explanatory dictionary.
	4. Tests

Topic 2. Types and specifications of microprocessors
.
	1. Control on lectures
	  2. Laboratory work 2 – Types of microprocessors and their characteristics. Central processor of a personal computer;
	  3. Questions submitted for independent study - Creating an explanatory dictionary
	4. Tests

Topic 3. System boards and buses	1. Control on lectures
	  2. Laboratory work 3 - Motherboard and its components. Determination of the characteristics of the motherboard of a personal computer
	  3. Questions submitted for independent study - Creating an explanatory dictionary.
	4. Tests

Topic 4. RAM
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	1. Control on lectures
	  2. Laboratory work 4 - Internal memory of a personal computer . Diagnostics of operational and cache memory and their performance check
	  3. Laboratory work 5 - Creation of a virtual disk in the RAM of a personal computer
	  4. Questions submitted for independent study - Creating an explanatory dictionary.
	5. Tests

Topic 5. ATA/IDE, SATA interface .	1. Control on lectures 2. Laboratory work 6 - Connecting and configuring ATA / SATA interface devices 3. Questions submitted for independent study - Creating an explanatory dictionary. 4. Tests
Topic 6. Serial, parallel and other input/output interfaces	1. Control on lectures 2. Questions submitted for independent study - Creating an explanatory dictionary. 3. Tests
Topic 7. Power supply units and cases of personal computers	1. Control on lectures 2. Laboratory work 7 - Case, power supply unit and areas of the PC system unit 3. Questions submitted for independent study - Creating an explanatory dictionary. 4. Tests

Topic 8. Magnetic data storage devices. Accumulators on hard disks	1. Control on lectures 2. Laboratory work 8 - Accumulators on hard magnetic disks of a personal computer 3. Laboratory work 9 - Creating a virtual hard disk on a physical disk 4. Laboratory work 10 - Creating a virtual hard disk using the Oracle program VW VirtualBox . OS installation 5. Questions submitted for independent study - Creating an explanatory dictionary. 6. Tests
Topic 9. Accumulators with removable media. Flash media are optical data storage devices	1. Control on lectures 2. Laboratory work 11 - Drives on optical discs 3. Questions submitted for independent study - Creating an explanatory dictionary. 4. Tests
Topic 10. Video adapters and monitors. Audio devices. Network equipment	1. Control on lectures 2. Laboratory work 12 - PC communication equipment. Video adapter, monitors, audio systems and network card 3. Questions submitted for independent study - Creating an explanatory dictionary. 4. Tests
Topic 11. Information input and output devices. Scanners and printers	1. Control on lectures 2. Questions submitted for independent study - Creating an explanatory dictionary. 3. Tests

31   Tips for successful study

The goal is unique to everyone, but its correct setting greatly affects the result, as well as the learning process. For example,
- processing the materials of the theoretical component (lectures) of the discipline will provide insight and knowledge about the
- development process and the architecture of the OS itself, and the implementation of the practical component - the acquisition
- of practical skills in the use of methods and tools for creating system software. After all, any training that follows a clear plan and
- with a serious attitude to the material will always be successful.

So, if you want to successfully master this subject, you must be:
- persistent, attentive and inquisitive;
- creative and cheerful, open to communication and discussions
- ready to receive information and knowledge on the subject not only during lectures, but also during extracurricular hours

See you soon!