

ODESSA I.I. MECHNYKOV NATIONAL UNIVERSITY
FACULTY OF MATHEMATICS, PHYSICS AND INFORMATION TECHNOLOGIES
DEPARTMENT OF MATHEMATICAL SUPPORT OF COMPUTER SYSTEMS

Syllabus of the course "Virtualization technologies in computer systems"

Amount	total number of: credits -4; hours – 120; content modules - 3
Semester	autumn
Days, Time, Place	according to the class schedule
Teacher(s)	Oleksandr Antonenko, Ph.D. (physics and mathematics), Associate Professor of the Department of Mathematical Support of Computer Systems
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E-mail	antonenko@onu.edu.ua ; asantonenko@gmail.com
Workplace	department of mathematical support of computer systems
Consultations	face-to-face consultations: according to the class schedule online consultations: ZOOM (link is generated at the beginning of classes)

COMMUNICATION

Communication with students will be carried out by e-mail, in the classroom or via ZOOM.

COURSE ABSTRACT

Subject of the study of the course is the main types, methods, platforms and technologies of virtualization of computer systems.

Course prerequisites

The course material is based on previously acquired knowledge, practical skills and skills of the topics and areas related to the architecture of computers, computer networks, and operating systems. The corresponding courses are taught within the educational program of the first (bachelor) level of higher education in specialty 126 "Information systems and technologies".

Post-requisites of the course

This course is the basis for mastering the following disciplines of the educational and professional master's training program in the specialty 126 "Information systems and technologies": "Professional research practice", "Execution of master's qualification work".

Purpose of the course is to study and acquire knowledge and skills about virtualization technologies, terminology, varieties and main advantages of virtualization.

Course content

Considered:

- History, modern technologies and virtualization platforms, features and advantages.
- Architecture and features of virtual machines.
- Server virtualization (full virtualization and paravirtualization).
- Virtualization at the level of operating systems.
- Application virtualization and workplace virtualization.
- Microsoft virtualization technologies and platforms.
- VMware virtualization technologies and platforms.
- Virtualization technologies and platforms in the Linux OS (Xen, KVM, Citrix XenServer, QEMU, LXC, Docker).

EXPECTED RESULTS

As a result of studying the course, the student must

know: the main terms and key concepts of virtualization, the main types of virtualization, modern virtualization platforms and their components.

be able: design and administer a distributed network information system based on knowledge of basic architectures, protocols and principles of virtualization using modern Oracle, VMware and Microsoft platforms and environments.

Competencies that the student receives as a result of studying the course:

- *the ability to develop and apply ICT necessary for solving strategic and current tasks;*
- *the ability to design information systems taking into account the specifics of their purpose, incomplete / insufficient information and conflicting requirements.*

Learning outcomes: upon completion of the course, the student will have skills

- *make effective decisions on the problems of information infrastructure development, creation and application of IT;*
- *justify the choice of technical and software solutions taking into account their interaction and potential impact on solving organizational problems, organize their implementation and use;*
- *make a reasonable choice of project solutions and design a service-oriented information architecture of the enterprise (institution, organization, etc.).*

FORMS AND METHODS OF TEACHING

The course will be taught in the form of lectures (18 hours) and laboratory classes (18 hours), organization of students' independent work (84 hours).

The basic training of students is carried out in lectures and laboratory classes.

During the teaching of the course, the following teaching methods are used: verbal (lecture, explanation); face-to-face (Power Point presentation); practical (laboratory works); work with literary sources (independent work of students, student essays and reports).