Cloud Computing

Course Workload		Assessment form (examination/ graded test/ ungraded test)
ECTS	**Hours**	
3	**108**	**Exam**

As a result of mastering the discipline, undergraduates will acquire: Knowledge: - the main types and platforms of cloud computing; - typical models for the implementation of MOV; - principles of operation of storages, virtual networks. Skills: - manage virtual resources; - assess the possibility of scaling computing processes based on the concept of MOV; configure virtual switches and network storages using various protocols. Skills: - adaptation of classical algorithms and MOV data models for solving applied problems (dissertation research); - working with technical documentation and standards in foreign languages.

Course structure:

1. Introduction to Virtualization and Cloud Computing

1.1. The concept of virtualization, types and scope of virtualization, virtualization infrastructure; workstation virtualization, resource virtualization and sharing; application virtualization and hardware virtualization; containers, orchestration. SaaS, PaaS, IaaS principles. The concept of cloud computing, types of cloud computing, cloud computing platforms.

2. Create virtual machines

2.1. Virtual machines, basic definitions, resource allocation, the concept of a hypervisor, managing virtual machines, creating a server infrastructure.

3. Setting up and managing virtual networks

3.1. Principles of configuring virtual networks, including configuring VLANs, Management interfaces, and protecting switches. The options for configuring standard and distributed switches, the principles of organizing load balancing (IP, MAC, Port) are considered.

4. Setting up and managing virtual storage

4.1. Principles of operation of the iSCSI, NFS, FC, FCoE protocols. Storage setup, storage protection organization principles, resource allocation.

5. Virtual Machine Management and Network Troubleshooting

5.1. Creating templates and clones, working with the virtual machine reservation function, basic troubleshooting methods in a virtual infrastructure.

6. Resource management and, security and monitoring

6.1. Resource management, load balancing in data centers, basic security principles, encryption of virtual machines, monitoring and analysis of user actions.