ITMO

ITMO University

Computer Networks – Advanced Features

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

The course is designed for a deep understanding and deep understanding of corporate computer networks, including different types of VPN implementations (point-to-point, multipoint). The course provides knowledge about the software-defined networking paradigm, search for feature virtualization and overlay technologies, including VXLAN and NVGRE.

Course structure:

1. Introduction to VPN

1.1. Types of VPN: site-to-site, multipoint. Classification of VPNs, advantages and disadvantages of various types of VPN.
2. Building dynamic multipoint VPN (DMVPN)

2.1. DMVPN construction principles, including implementation protocols: IPSEC, mGRE, NHRP. During practice, it is planned to configure dynamic multipoint VPNs in a virtual emulation environment
3. Building of Group Encrypted Transport (GET) VPN

3.1. GETVPN construction principles, including implementation protocols: IPSEC, key server, GDOI. During practice, it is supposed to configure GET VPN in a virtual emulation environment.
4. Principles of building software-defined networks

4.1. The concept of SDN (software defined networks). Controller definition. Openflow protocol. Cisco ACI technology.
5. Network Functions Virtualization

5.1. The concept of NFV. Virtualization of network devices: routers, switches, firewalls, etc. Configuring a virtual switch.
6. Building of overlay computer networks (VXLAN, NVGRE)

6.1. Basic concepts and definitions of overlay networks. Principles of functioning of technologies VXLAN, NVGRE. Setting up VXLAN in a virtual emulation environment.