ITM OPERATIONS (ITMO)

ITMO 517
Shell Scripting for System Administration
Focuses on preparation of shell scripts to enhance and streamline system administration tasks in all contemporary server operating systems. Scripting will be taught in both native and portable environments. The course will address shell programming, regular expressions, common and system-specific shell utilities and built-in commands, user defined and shell variables, flow control structures, shell functions, and the creation and execution of shell scripts. Homework and hands-on exercises will provide practical experience in contemporary server environments. Same as ITMO 417.
Prerequisite(s): ITMO 556 with min. grade of C
Lecture: 3 Lab: 0 Credits: 3

ITMO 533
Enterprise Server Administration
Students learn to set up, maintain, and administer X86-based servers and associated networks using a contemporary industry-standard proprietary operating system. Topics include hardware requirements; software compatibility; system installation, configuration, and options and post-installation topics; administrative and technical practices required for system security; process management; performance monitoring and tuning; storage management; back-up and restoration of data; and disaster recovery and prevention. Also addressed is configuration and administration of common network and server services such as DNS, DHCP, remote access, email, basic virtualization, web and web services, and more.
Prerequisite(s): ITMO 540 with min. grade of C
Lecture: 3 Lab: 0 Credits: 3

ITMO 540
Introduction to Data Networks and the Internet
This course covers current and evolving data network technologies, protocols, network components, and the networks that use them, focusing on the Internet and related LANs. The state of worldwide networking and its evolution will be discussed. This course covers the Internet architecture, organization, and protocols including Ethernet, 802.11, routing, the TCP/UDP/IP suite, DNS, SNMP, DHCP, and more. Students will be presented with Internet-specific networking tools for searching, testing, debugging, and configuring networks and network-connected host computers. There will be opportunities for network configuration and hands-on use of tools.
Lecture: 3 Lab: 0 Credits: 3

ITMO 541
Network Administration and Operations
Students learn the details, use, and configuration of network applications. Currently protocols and application technologies considered include SNMP, SMTP, IMAP, POP, MIME, BOOTP, DHCP, SAMBA, NFS, AFS, X, HTTP, DNS, NetBIOS, and CIFS/SMB. Windows workgroups and domains: file and printer sharing, remote access, and Windows networking are addressed. A research paper in the above topic areas is required.
Prerequisite(s): ITMO 540 with min. grade of C
Lecture: 3 Lab: 0 Credits: 3

ITMO 542
Wireless Technologies and Applications
This course will provide students with the knowledge of wireless communication technologies. The course will focus on the 3G and 4G wireless networks such as UMTS, LTE, and WiMAX. Students will have the opportunity to study the different wireless networks architectures and major network elements including devices, base stations, base station controller, and core networks. Major topics of the course include air interfaces, protocols, session management, QoS, security, mobility, and handoff.
Lecture: 3 Lab: 0 Credits: 3

ITMO 544
Cloud Computing Technologies
Computing applications hosted on dynamically-scaled, virtual resources available as services are considered. Collaborative and non-collaborative "cloud-resident" applications are analyzed with respect to cost, device/location independence, scalability, reliability, security, and sustainability. Commercial and local cloud architectures are examined. A group-based integration of course topics will result in a project employing various cloud computing technologies.
Prerequisite(s): ITMO 556 with min. grade of C and ITMD 510 with min. grade of C
Lecture: 3 Lab: 0 Credits: 3

ITMO 545
Telecommunications Technology
This course introduces technologies underlying telecommunications and real-time communications systems and services. Topics will include: wire-line and fiber systems including those associated with the public switched telephone networks and cable service providers; wireless systems including cellular, WiFi and WiMAX. Methods and architectures for delivery of signaling, voice and video are introduced; analog telephone systems, digital telephone systems on circuit switched networks both wire-line and cellular; digital telecommunications on packet switched networks. Codecs and transformation of voice and video into digital formats are introduced. Physical and data-link layer protocols are studied with emphasis on how they carry voice and video. Channelization and multiple-access methods are introduced. Switching methods studied include circuit switching, virtual circuit switching and packet switching.
Lecture: 3 Lab: 0 Credits: 3

ITMO 546
Telecommunications Over Data Networks
This course covers a suite of application protocols known as Voice over IP (VoIP). It describes important protocols within that suite including RTP, SDP, MGCP and SIP and the architecture of various VoIP installations including on-net to on-net to PSATN and inter-domain scenarios. The functions of the Network Elements that play significant roles in this architecture will be defined. Examples of network elements that are currently available as products will be examined.
Lecture: 2 Lab: 2 Credits: 3
Lecture: min. grade of C
Prerequisite(s): source software.

email, web, and web services as well as support issues for open
dNS, DHCP, firewall, proxy, remote access, file and printer sharing,
and administration of common network and server services such
sion; configuration
tuning; storage management; back-up and restoration of data; and
system security; process management; performance monitoring and
compatibility; administrative and technical practices required for
security, process management; performance monitoring and
ting; storage management; back-up and restoration of data; and
system security; process management; performance monitoring and
and skills required to configure networked storage to include archive,
system architecture; package management; command–line
commands; devices, filesystems, and the filesystem hierarchy
standard. Also addressed are applications, shells, scripting and data
management; user interfaces and desktops; administrative tasks;
essential system services; networking fundamentals; and security,
as well as support issues for open source software. Multiple
distributions are covered with emphasis on the two leading major
distribution forks.

Prerequisite(s): ITMO 546 with min. grade of C
Lecture: 2 Lab: 2 Credits: 3

ITMO 554
Operating Systems Virtualization
This course will cover technologies allowing multiple instances
of operating systems to be run on a single physical system.
Concepts addressed will include hypervisors, virtual machines,
paravirtualization and virtual appliances. Both server and desktop
virtualization will be examined in detail, with brief coverage of
storage virtualization and application virtualization. Business
benefits, business cases and security implications of virtualization
will be discussed. Extensive hands-on assignments and a group
project will allow students to gain first-hand experience of this
technology.
Prerequisite(s): ITMO 556 with min. grade of C
Lecture: 2 Lab: 2 Credits: 3

ITMO 556
Introduction to Open Source Software
This course will cover the fundamental concepts and philosophy
behind free and open source software (FOSS). The course will
discuss open source and free software licensing; open source
business strategies and impact; FOSS utilization in the enterprise;
and development methodologies. Students will learn to set up and
configure an industry-standard open source operating system,
including system installation, and basic system administration;
system architecture; package management; command–line
commands; devices, filesystems, and the filesystem hierarchy
standard. Also addressed are applications, shells, scripting and data
management; user interfaces and desktops; administrative tasks;
esential system services; networking fundamentals; and security,
as well as support issues for open source software. Multiple
distributions are covered with emphasis on the two leading major
distribution forks.

Lecture: 2 Lab: 2 Credits: 3

ITMO 557
Storage Technologies
Modern enterprise data storage technologies and architectures are
examined in depth. Topics include storage devices, file systems,
storage networks, virtual storage, RAID, NAS, SAN, and other current
enterprise-level storage models. Storage management, replication,
deduplication, storage tiers, backups as well as fundamentals of
business continuity, application workload, system integration, and
storage/system administration are addressed. Specific knowledge
and skills required to configure networked storage to include archive,
backup, and restoration technologies are covered.

Lecture: 3 Lab: 0 Credits: 3