Title	Code
Computer networks	**1010334471010330582**
Field: **Computer Science**	Year / Semester: **4 / 7**
Specialty: **-**	Course: **core**
Hours: Lectures: **3** Classes: **12** Laboratory: **1** Projects / seminars: **-**	Number of credits: **4**
	Language: **polish**

Lecturer:

dr inż. Tomasz Bilski
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Faculty:

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Status of the course in the study program:

obligatory

Assumptions and objectives of the course:

The main objective of the course is to provide knowledge on different computer networks technologies, including: transmission media, network hardware, methods and principles of communication, communication protocols in ISO/OSI layers. Additionally students have to obtain skills in making decisions on computer network design, installation and configuration.

Contents of the course (course description):

Lecture

Computer networks classification (LAN, MAN, WAN, wired, wireless). Communication models (point to point, broadcast, multicast, connection oriented, connectionless, peer to peer, client-server). Modes of transmission: synchronous, asynchronous, isochronous, narrowband, wideband. Topology. Media parameters and applications: twisted pair, coaxial, fiber, infrared, radio bands. Structured cabling. Multilayer transmission model. Physical and link layers. Communication channel access methods: CSMA/CD. Network hardware: network interface card, modem, hub, switch. Main technologies: Ethernet, ATM, IEEE 802.11. Last mile networks (DSL, GSM, UMTS, CATV, PLC). Internetwork layer, IPv4, host addressing. Routers and switches. Routing algorithms and protocols. ICMP. Transport layer, TCP (ports, sockets, circuit opening and closing). UDP.

Classes

Transmission parameters analysis (delay, throughput) based on Ethernet network. IP addressing. Routing table optimization with distance-vector and Dijkstra algorithms. TCP analysis: optimum window calculation.

Laboratory

Network configuration, basic network parameters analysis (ipconfig, netstat, ping, tracert, arp). Experiments with basic network protocols (Ethernet, IP, TCP) with protocol monitoring program (Wireshark). Routing tables optimization for different network topologies (experiments with simulation tools). Fundamentals of network programming.

Introductory courses and the required pre-knowledge:

Operating systems, electronics, foundations of programming

Courses form and teaching methods:

Lecture with multimedia presentation

Classes
Laboratory

Form and terms of complete the course - requirements and assessment methods:

Lecture: written exam
Classes: test
Laboratory: experiments and reports evaluation

Basic Bibliography:

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Additional Bibliography:

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