

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Routing algorithms and protocols		Code 1010332511010337163
Field of study Information Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 1
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) elective
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 30 Classes: - Laboratory: 30 Project/seminars: -		No. of credits 5
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 5 100%
Responsible for subject / lecturer: dr inż. Tomasz Bilski email: tomasz.bilski@put.poznan.pl tel. 061 66 53 554 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Student has knowledge from bachelor's degree.
2	Skills	Student has skills from bachelor's degree.
3	Social competencies	Student has social competencies from bachelor's degree.
Assumptions and objectives of the course: Students should obtain knowledge of many issues related to routing algorithms and protocols.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Student has knowledge of contemporary trends and most important achievements in IT. - [K_W14]		
Skills:		
1. Student is able to use sophisticated IT tools and technologies. - [K_U10]		
Social competencies:		
Assessment methods of study outcomes		
Lecture: written exam.		
Laboratory: tests, exercises assessment, reports assessment.		
Course description		

<p>Lecture.</p> <p>IPv4, packet structure, addressing, ARP, CIDR, NAT. IPv6. Autonomous systems: definition, numbering, classification: end, transit, multihomed. Routing algorithms: static, dynamic. Route optimization. Source routing, shortest path algorithm (Dijkstra), distance-vector algorithms, link-state algorithms. Routing protocols: RIP, OSPF, BGP, IGRP, EIGRP, OSPF, IS-IS. Multicasting routing: source trees, shared trees, IGMP, reverse path forwarding, protocols: PIM, MBGP, DVMRP, MOSPF. Wireless mesh networks routing protocols: OLSR, AODV, HSL, ZRP, AWPP, MobileMESH, IpMESH. Internetwork layer switching: MPLS, equivalence class. Routers: elements, functions, queue management: FIFO, FIFO + drop tail, random drop on full, drop front on full, early drop, RED. Router operating systems: IOS (Cisco), JUNOS (Juniper Networks), 3Com Operating System (3Com), SR_OS (Alcatel).</p> <p>Course update 2017: new models for networks (NFV, SDN).</p> <p>Teaching methods:</p> <ul style="list-style-type: none"> - lecture with multimedia presentations, - additional topics available in Moodle course. <p>Laboratory.</p> <p>Exercises with a use of different routing algorithms and protocols.</p>		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Comer D. E., Computer Networks and Internets 2. Hall E.A., Internet Core Protocols, O'Reilly, Sebastopol 2000. 3. Tanenbaum A., Computer Networks 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Ahmad K., Sourcebook of ATM and IP Internetworking. IEEE Press, Wiley Interscience, 2002. 2. Black U, MPLS and Label Switching Networks, Prentice Hall, 2002. 3. Chao J., Lam C. H., OKI E., Broadband Packet Switching Technologies. A practical Guide to ATM Switches and IP Routers, John Wiley & Sons, 2001. 4. Malhotra R., IP routing, O'Reilly Media, Inc., 2002. 		
<p>Result of average student's workload</p>		
<p>Activity</p>	<p>Time (working hours)</p>	
1. Lectures	30	
2. Laboratory	30	
3. Exam preparation	30	
4. Theoretical preparation for laboratory	15	
5. Practical preparation for laboratory	15	
6. Exam	2	
7. Reports preparation	15	
8. Consultations	3	
<p>Student's workload</p>		
<p>Source of workload</p>	<p>hours</p>	<p>ECTS</p>
Total workload	140	4
Contact hours	65	2
Practical activities	45	1