

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Routing algorithms and protocols</b>		Code <b>1010335411010337163</b>
Field of study <b>Computer Science</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>1 / 1</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>polish</b>	Course (compulsory, elective) <b>elective</b>
Cycle of study: <b>Second-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: <b>16</b> Classes: <b>-</b> Laboratory: <b>16</b> Project/seminars: <b>-</b>		No. of credits <b>5</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b>		ECTS distribution (number and %) <b>5 100%</b>
<b>Responsible for subject / lecturer:</b> 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		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Student has knowledge from bachelor's degree.
2	<b>Skills</b>	Student has skills from bachelor's degree.
3	<b>Social competencies</b>	Student has social competencies from bachelor's degree.
<b>Assumptions and objectives of the course:</b> Students should obtain knowledge of many issues related to routing algorithms and protocols.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Student has knowledge of contemporary trends and most important achievements in IT. - [K_W14]		
<b>Skills:</b>		
1. Student is able to use sophisticated IT tools and technologies. - [K_U10]		
<b>Social competencies:</b>		
<b>Assessment methods of study outcomes</b>		
Lecture: written exam.		
Laboratory: tests, exercises assessment, reports assessment.		
<b>Course description</b>		

<p>Lecture.                  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>Laboratory.                  Exercises with a use of different routing algorithms and protocols.</p>		
<p><b>Basic bibliography:</b></p> <ol style="list-style-type: none"> <li>1. Comer D. E., Computer Networks and Internets</li> <li>2. Hall E.A., Internet Core Protocols, O'Reilly, Sebastopol 2000.</li> <li>3. Tanenbaum A., Computer Networks</li> </ol>		
<p><b>Additional bibliography:</b></p> <ol style="list-style-type: none"> <li>1. Ahmad K., Sourcebook of ATM and IP Internetworking. IEEE Press, Wiley Interscience, 2002.</li> <li>2. Black U, MPLS and Label Switching Networks, Prentice Hall, 2002.</li> <li>3. Chao J., Lam C. H., OKI E., Broadband Packet Switching Technologies. A practical Guide to ATM Switches and IP Routers, John Wiley &amp; Sons, 2001.</li> <li>4. Malhotra R., IP routing, O'Reilly Media, Inc., 2002.</li> </ol>		
<p><b>Result of average student's workload</b></p>		
<p><b>Activity</b></p>		<p><b>Time (working hours)</b></p>
1. Lectures		16
2. Laboratory		16
3. Exam preparation		40
4. Theoretical preparation for laboratory		20
5. Practical preparation for laboratory		34
6. Exam		2
7. Reports preparation		20
8. Consultations		3
<p><b>Student's workload</b></p>		
<p><b>Source of workload</b></p>	<p><b>hours</b></p>	<p><b>ECTS</b></p>
Total workload	151	5
Contact hours	50	2
Practical activities	35	1