

(faculty stamp)

## COURSE DESCRIPTION

Z1-PU7

WYDANIE N1

Strona 1 z 3

<b>1. Course title: INTERNET TECHNOLOGIES</b>		<b>2. Course code</b>		
<b>3. Validity of course description: 2016/2017</b>				
<b>4. Level of studies: 1<sup>st</sup> cycle of higher education</b>				
<b>5. Mode of studies: intramural studies</b>				
<b>6. Field of study: AUTOMATION AND ROBOTICS</b>			RAU	
<b>7. Profile of studies: general</b>				
<b>8. Programme:</b>				
<b>9. Semester: 5</b>				
<b>10. Faculty teaching the course: Automatic Control, Electronics and Computer Science</b>				
<b>11. Course instructor: Jerzy Mościński, PhD</b>				
<b>12. Course classification: common courses</b>				
<b>13. Course status: compulsory</b>				
<b>14. Language of instruction: English, Polish</b>				
<b>15. Pre-requisite qualifications: Course attendants are supposed to have general knowledge and practical skills concerning content of the following courses: Fundamentals of Computer Programming, Object Oriented Programming, Operating Systems, Databases.</b>				
<b>16. Course objectives: Course aims at having the students got accustomed with up-to-date Internet programming technologies and effective usage of Internet services. Course content includes technologies concerning building and using Internet databases and examples of its usage in industry, education and commerce. The course concerns fundamental concepts and technologies of computer networks as basis for designing and implementing Internet services.</b>				
<b>17. Description of learning outcomes:</b>				
Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Knows rules concerning design and functioning of internetworks and methods of implementing internet services by means of up-to-date hardware/software solutions.	assessment test	lecture	K_W6/3;
2.	Knows basic Internet technologies and protocols, specification and tools for internet services implementation.	assessment test	lecture	K_W6/3; W5/1;W20/1
3.	Knows how to design and implement Internet systems for enhancing education and engineering design, by means of efficient Internet technologies and services.	assessment test	lecture	K_W6/3; W20/1; W25/1
4.	Can define functionality of Internet system according to customer needs and available Internet technologies.	project work/report/presentation assessment	project work	K_U13/3;
5.	Can use available tools and software platforms in order to build Internet systems using modern technologies.	project work/report/presentation assessment	project work	K_U13/3
6.	Can test developed Internet systems, identify system deficiencies and remove it, and implement components supporting secure usage of designed system.	project work/report/presentation assessment	project work	K_U13/3
7.	Can convincingly present concept of Internet system and its implementation to potential investor, customer and user.	project work/report/presentation assessment	project work	K_K02/1 K_K07/2

**18. Teaching modes and hours**

Lecture 30 h / BA /MA Seminar / Class / Project 30 h / Laboratory

**19. Syllabus description:****Lecture:**

Lecture covers wide spectrum of topics concerning introduction to computer networks as used for building Internet systems and developing and implementing Internet services by means of Internet technologies. Below, major groups of lecture topics are quoted: Computer networks functioning basics, review of typical technologies used in computer networks based communication. Computer networks applications, security in computer networks, quality of network and Internet services.

Internet based services, Internet as example of computer networks globalisation, Internet access methods, hardware and software resources for building and using Internet services.

Internetworks functioning basics, layered models of computer network (TCP/IP), Internet protocols in relation with Internet services and Internet applications programming, typical Internet based applications, remote work and internetwork file transfer canonical applications.

Defining and using Internet technologies, HTTP protocol and www architecture, HTML language as web systems building basis, modern web systems building frameworks, CSS cascading style sheets system.

Advanced Internet technologies for web systems, XML language with tools, MathML language, JavaScript extension, Flash technology. Java language technologies for Internet services programming, applets and applications programmed in Java, servlet technology, JavaBeans, Java as universal platform for building interactive Internet applications.

Technologies for implementing database services with Internet access, CGI technology, various methods of building interactive web systems, JSP and ASP technologies with connection to database services, PHP language and technology.

www servers configuration and administration, relational database systems configuration (MySQL and PostgreSQL), PHP based systems configuration, examples of design and implementation of interactive web services with database components.

AJAX technology as merging JavaScript and XML for implementing new technique of Internet application building. Content Management Systems – CMS – for supporting building and maintenance of web services systems by target users.

Protection technologies in Internet systems, access control, coding and data transfer security, building protection system on system, network and internetwork levels.

Internet technologies in e-learning systems, creating autonomous Internet database systems for enhancing open and remote studying platforms.

Using Internet technologies for remote operation of apparatus and devices, creating and maintaining virtual and remote laboratories for multiplying access to unique laboratory devices and research experiments.

Internet technologies in engineering design systems, technologies for presenting and publishing research and design results by means of Internet platform.

**Project:**

Project topics vary every year and are proposed by course tutors or external (industrial) bodies. Typically project work concerns some of the following topical areas: programming Internet portals using HTML language and CSS system; using JavaScript extension for enhancing web pages; programming applets and applications in Java language for Internet systems; using Java and similar platforms for engineering design and education applications programming; object oriented programming for Internet applications; programming in PHP, Internet databases; programming Internet systems for university studies organisation enhancement; advanced PHP programming applications; advanced JavaScript programming; presentation components, ActionScript language and similar; advanced animation components based on ActionScript language; advanced Java based systems for engineering design and education. Every project is accompanied by preparation of extensive report/documentation and several variants of project results (product) presentation with different target consumers in mind.

**20. Examination: no****21. Primary sources:**

James F. Kurose, Keith W. Ross, Computer Networking: A Top-Down Approach, 6<sup>th</sup> Edition, Pearson, 2013, (5<sup>th</sup>-PL Helion, 2012), ISBN-10: 0132856204, ISBN-13: 978-0132856201.

Douglas E. Comer, Computer Networks and Internets with Internet Applications, 6<sup>th</sup> Edition, Pearson, 2014, ISBN 10: 0133587932 ISBN 13: 9780133587937.

Andrew Stuart Tanenbaum, Computer Networks, 5<sup>th</sup> Edition, Pearson, 2010, ISBN-10: 0132126958, ISBN-13: 978-0132126953.

**22. Secondary sources:**

Steven M. Schafer, HTML, XHTML i CSS. Biblia, Wydanie V, Helion, 2010, ISBN 978-83-246-2742-4, 9788324627424.

William Stallings, Data and Computer Communication, 10<sup>th</sup> Edition, Pearson, 2014, Print ISBN 9780133506488, 0133506487.

Douglas E. Comer, Internetworking with TCP/IP, Vol. 1, 6<sup>th</sup> Edition, Pearson, 2014, Print ISBN: 9780136085300, 013608530X.

**23. Total workload required to achieve learning outcomes**

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	30/5
2	Classes	/
3	Laboratory	/
4	Project	30/25
5	BA/ MA Seminar	/
6	Other	0/5
	Total number of hours	60/35

**24. Total hours: 95****25. Number of ECTS credits: 3****26. Number of ECTS credits allocated for contact hours: 2****27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 2****26. Comments:**

Approved:

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(date, Instructor's signature).....  
(date, the Director of the Faculty Unit signature)