

KARTA OPISU MODUŁU KSZTAŁCENIA		
Nazwa modułu/przedmiotu Sieci i oprogramowanie systemowe		Kod 1010532111010519199
Kierunek studiów Automatyka i robotyka	Profil kształcenia (ogólnoakademicki, praktyczny) ogólnoakademicki	Rok / Semestr 1 / 1
Ścieżka obieralności/specjalność Smart aerospace and autonomous systems	Przedmiot oferowany w języku: angielski	Kurs (obligatoryjny/obieralny) obligatoryjny
Stopień studiów: II stopień	Forma studiów (stacjonarna/niestacjonarna) stacjonarna	
Godziny Wykłady: 15 Ćwiczenia: - Laboratoria: 15 Projekty/seminaria: -		Liczba punktów 3
Status przedmiotu w programie studiów (podstawowy, kierunkowy, inny) (ogólnouczelniany, z innego kierunku) kierunkowy z danego kierunku		
Obszar(y) kształcenia i dziedzina(y) nauki i sztuki		Podział ECTS (liczba i %)
Odpowiedzialny za przedmiot / wykładowca:		
<p>dr inż. Michał Sajkowski, doc. email: michal.sajkowski@put.poznan.pl tel. 61 6653062 Wydział Informatyki ul. Piotrowo 3, 60-965 Poznań</p>		
Wymagania wstępne w zakresie wiedzy, umiejętności, kompetencji społecznych:		
1	Wiedza:	Student starting this module should have basic knowledge regarding computer systems organization, algorithms and data structures, and operating systems.
2	Umiejętności:	He/she should have skills allowing formulation of algorithms and their programming with the use of at least one widely used software tool. He/she should have skills that are necessary to acquire information from given sources of information. Student should understand the need to extend his/her competences and should express cooperativeness in a team.
3	Kompetencje społeczne	In addition, in respect to the social skills the student should show attitudes as honesty, responsibility, perseverance, curiosity, creativity, manners, and respect for other people.
Cel przedmiotu:		
<p>1. Provide students knowledge regarding computer networks, within the scope of using, configuration, design and programming of local area and wide area networks, and cognition of technical solutions applied in these networks. Provide students basic knowledge regarding real-time operating systems.</p> <p>2. Develop students? skills in solving simple problems related to the use and configuration of computer networks.</p> <p>3. Develop students? skills in team work, especially in configuration, design, and programming of technical solutions applied in computer networks.</p>		
Efekty kształcenia i odniesienie do kierunkowych efektów kształcenia		
Wiedza:		
<p>1. acquire specialist knowledge on remote systems, distributed systems, real-time systems and network systems - [K_W3]</p> <p>2. have well-ordered, theoretically based and detailed knowledge on analysis and design methods of control systems - [K_W7]</p> <p>3. be informed about trends and advances in automatics and robotics and allied fields of study - [K_W12]</p>		
Umiejętności:		
<p>1. is able to analyze and interpret technical documentation of the design, and use scientific literature related to given subject. - [K_U2]</p> <p>2. is able to plan and arrange self-education process in order to improve and update his/her professional attitudes. - [K_U6]</p> <p>3. is able to evaluate usability and possibility of the use of new achievements in automatics and robotics (technique and technology). - [K_U16]</p> <p>4. is able to design and implement complex device, object or system, considering non-technical aspects. - [K_U23]</p>		
Kompetencje społeczne:		

1. understands the needs, and knows the possibilities of supplementing one's education ? improving of professional, personal and social attitudes, is able to inspire and organize the process of the education of other persons. - [K_K1]
2. is aware of the importance and understands the nontechnical aspects and effects of engineering activity, including its impact on environment, and corresponding responsibility of undertaken decisions. - [K_K2]
3. is aware of the responsibility of its own work, and is able to conform to the rules of team work and being responsible for commonly implemented tasks, is able to manage the team work, and is able to define the aims and assign the priorities of a task - [K_K3]
4. is aware of the necessity of a professional approach to the technical topics, detailed study of the technical documentation and environmental conditions, in which devices or their parts may function. - [K_K4]
5. is able to think and act creatively and enterprisingly. - [K_K5]

Sposoby sprawdzenia efektów kształcenia

Formative assessment:

a) lectures:

based on answers to questions on previous lectures,

b) laboratory classes:

evaluation of doing correctly assigned tasks,

Total assessment:

a) verification of assumed learning objectives related to lectures:

based on the sum of answers and the activity during lectures.

b) verification of assumed learning objectives related to laboratory classes:

i. evaluation of student's skills related to carrying out the lab tasks,

ii. monitoring students' continuing activities during classes,

iii. evaluation of students' knowledge and skills related to configuration task

iv. evaluation of students' knowledge and skills based on written test, covering from 3 to 5 questions. In order to obtain positive note, the student should obtain 50% of maximum number of points. During the test, student cannot use any lecture notes, books, etc.

Additional elements cover:

i. discussing more general and related aspects of the class topic,

ii. effectiveness of the acquired knowledge during the solving of given problem

iii. ability of cooperation in a team during solving laboratory task

iv. showing how to improve the instructions and teaching materials.

v. Indication of students' perception difficulties, allowing improvement of didactic process.

Treści programowe

The lecture should cover the following topics

1) Fundamentals of computer networks (historical note, motivation, required properties of a network, network architecture: OSI and TCP/IP, network topologies, network types, network devices, standards).

2) Network access technologies (functions of network interface card: encoding, framing, error detection, reliable transmission, link access methods), local area networks (CSMA/CD - Ethernet, Token Ring ? FDDI, CSMA/CA ? wireless networks).

3) Delivery, forwarding and routing (packet switching, forwarding, routing ? routing algorithms, RIP and OSPF protocols, cell switching ? ATM, switching devices).

4) Internetworking (IPv4 protocol, IPv6 protocol, multicast, domain name system ? DNS).

5) Internet (structure, addressing, transport protocols: UDP, TCP, standards, applications).

6) Real-time operating systems (characteristics, applications, examples of systems).

The lab-classes should cover the following topics:

1) IPv4 addressing,

2) Configuration of Linux network

3) Network access protocols

4) Introduction to network socket interface

5) Server model using fork()

6) Server model using threads

7) Server model using events

Learning methods:

1. Lectures: multimedia presentation, presentation illustrated with examples presented on black board.

2. Labs: solving tasks, practical exercises with the use of network devices, discussion, teamwork, multimedia

showcase, configuration task verified during laboratory classes.		
Literatura podstawowa:		
1. TCP/IP Protocol Suite, Third edition, B.A. Forouzan, McGraw-Hill, Boston, 2006		
2. Computer Networks, Fifth edition, A.S. Tanenbaum, D.J. Wetherall, Pearson, Boston, 2011		
3. Computer Networking: A Top-Down Approach, Fifth edition, J.F. Kurose, K.W. Ross, Pearson Education, Boston, 2010		
4. Computer Networks: A Systems Approach, L.L. Peterson, B.S. Davie, Fifth edition, Morgan Kauffmann, San Francisco, 2012		
Literatura uzupełniająca:		
1. Network Analysis and Troubleshooting, J. Scott Haugdahl, Addison-Wesley, 1999		
Bilans nakładu pracy przeciętnego studenta		
Czynność		Czas (godz.)
1. participating in laboratory classes / tutorials		15
2. preparing to laboratory classes		15
3. consulting issues related to the subject of the course; especially related to laboratory classes,		8
4. preparing to assessment test, participation in assessment test:		12
5. participating in lectures		15
6. studying literature / learning aids, 10 pages of scientific text = 1 hour,		10
Obciążenie pracą studenta		
forma aktywności	godzin	ECTS
Łączny nakład pracy	75	3
Zajęcia wymagające bezpośredniego kontaktu z nauczycielem	38	2
Zajęcia o charakterze praktycznym	30	1