

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Sensor Networks</b>		Code <b>1010802131010812914</b>
Field of study <b>Electronics and Telecommunications</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>2 / 3</b>
Elective path/specialty <b>Information and Communication</b>	Subject offered in: <b>English</b>	Course (compulsory, elective) <b>elective</b>
Cycle of study: <b>Second-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>1</b> Classes: <b>-</b> Laboratory: <b>2</b> Project/seminars: <b>-</b>		No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>major</b>		(university-wide, from another field) <b>from field</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>2 100%</b> <b>2 100%</b>
<b>Responsible for subject / lecturer:</b>  dr inż. Robert Kotrys email: robert.kotrys@et.put.poznan.pl tel. +48 61 665 39 14 Faculty of Electronics and Telecommunications ul. Piotrowo 3A 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Students starting this course should have basic knowledge of Computer Networks course. [K1_W22]
2	<b>Skills</b>	Must have the ability to solve basic problems in the field of simple configuration of network devices. [K1_U25]
3	<b>Social competencies</b>	He should understand the need to expand their competences / have a willingness to work together as a team. Moreover, the social skills the student must present such attitudes as honesty, responsibility, perseverance, cognitive curiosity, creativity, manners, respect for other people. [K2_K04]
<b>Assumptions and objectives of the course:</b> The aim of the course is to familiarize students with the issues specific to sensor networks, in particular, refer to the standard 802 154 and the ZigBee standard as well as the methods and algorithms solutions, data link layer, network, and application of algorithms in the selection of paths in networks wieloskokowych.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b> 1. He has expertise in the construction and architecture of programmable digital systems and in their practical use - [K2_W02] 2. He has ordered a practical knowledge of the design of telecommunication networks or audio engineering or measuring systems and embedded. - [K2_W09] 3. He has ordered, mathematical underpinnings extensive knowledge in the field of telecommunication networks and ways to transfer information. - [K2_W13]		
<b>Skills:</b> 1. He can use the programmable integrated circuits and microcontrollers in the implementation of projects in the field of electronics and telecommunications. - [K2_U04] 2. Versed in the policies of standardization of technical solutions, knows international and national standardization bodies (ITU, ISO, ETSI, CISPR, 3GPP, etc.) - [K2_U08] 3. Able to design, build, program and test complex and technically advanced systems and electronic systems with particular emphasis on the needs of the equipment and telecommunication systems and networks. - [K2_U15]		
<b>Social competencies:</b>		

1. It can act as a co-leader of the group, is able to manage a small team. - [K2\_K01]
2. He understands the dilemmas of working in the field of electronics and telecommunications. He can think and act in an entrepreneurial manner. - [K2\_K03]
3. Knows the limits of their own knowledge and skills, understands the need for ongoing education. - [K2\_K04]

### Assessment methods of study outcomes

Forming Rating:

a) In the lecture:

based on answers to questions about the material discussed in the previous lectures,

b) in the laboratory / training:

based on an assessment of the progress of the task,

Rating summary:

a) in respect of lectures to verify the assumed effects of education is provided by:

assessment of knowledge and skills listed on the written test for a problematic, (5 questions with 25 questions available, the maximum score of 50 points, the allocation of 27 points).

discuss the results of the examination,

b) in the laboratory / exercise to verify the assumed effects of education is provided by:

continuous assessment for each course (oral response)? Rewarding gain skills they met the principles and methods

assessment report prepared partly in the classroom and partly after the end of the appraisal also includes the ability to work in a team,

### Course description

General characteristics of the sensor network.

Standards in sensor networks.

Specific Integrated Circuits - components of sensor networks

Construction of 802.15.4 physical layer network

Construction 802.15.4 MAC layer network

Construction of the data link layer 802.15.4 networks

Construction of the ZigBee network layer network

Construction of the ZigBee application layer network

Safety aspects of ZigBee networks

Aspects of designing appliances bareryjnie

MAC layer algorithms related to sensor networks

Algorithms for routing packets in networks wieloskokowych

Energy management in sensor networks

Aspects of the construction and programming of micro-controllers control network node.

#### Basic bibliography:

1. Nitaigour P. Mahalik (editor): Sensor Networks and Configuration. Springer-Verlag, 2007.

2. Cauligi S. Raghavendra, Krishna M. Sivalingam, Taieb Znati: Wireless sensor network. New York: Kluwer Academic Publishers, 2004

#### Additional bibliography:

1. . Chi-Fu Huang, Hsiao-Lu Wu, Yu-Chee Tseng. Distributed protocols for Ensuring Both Coverage and Connectivity of a Wireless Sensor Network. , 2007. ACM Transactions on Sensor Networks.

### Result of average student's workload

Activity	Time (working hours)
1. participation in lectures	15
2. laboratory classes	30
3. preparation for laboratory exercises	15
4. Preparation for the completion of the course	10
5. Passing lab exercise completion	2
6. Consulting with teachers	3

### Student's workload

<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	75	2
Contact hours	50	2
Practical activities	45	1