STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Radiocommunications		**1010804171010810324**
Field of study	Profile of study (general academic, practical)	Year /Semester
Electronics and Telecommunications	**general academic**	**4 / 7**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**obligatory**
Cycle of study:	Form of study (full-time,part-time)	
First-cycle studies	**part-time**	
No. of hours		No. of credits
Lecture: **-** Classes: **10** Laboratory: **-** Project/seminars: **-**		**1**
Status of the course in the study program (Basic, major, other)	(university-wide, from another field)	
other	**university-wide**	
Education areas and fields of science and art		ECTS distribution (number and %)
technical sciences		**1 100%**
Technical sciences		**1 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	A student knows the basics of digital communication systems, baseband transmission, digital modulation, signal transmission over the channel, reception techniques, spectrum shaping nad techniques for combating channel distortions (K1_W15); A student has detailed knowledge and mathematical foundations in the area of telecomunication theory, necessary for understanding, analysis and testing of the analogue and digital telecommunication systems (K1_W17)
2	**Skills**	A student can draw information from the literature, databases and other sources in Polish and in English; A student can integrate information, interprete it, draw conclusions and provide reasoning for his/her opinions (K1_U01); A student can solve problems in the area of electronics and telecommunications using mathematical tools: mathematical analysis, algebra and probability theory (K1_U07)
3	**Social competencies**	A student knows the limitations of his/her knowledge and competences, understands the necessity of further learning (K1_K01); A student is aware of the necessity of professional approach to technical problems and responsibility for his/her proposed technical solutions (K1_K02)

Assumptions and objectives of the course:

Knowing and understanding the fundamental problems of radio communication in various radio propagation environments and the basics of contemoprary wireless communication systems.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. A student has detailed knowledge and mathematical foundations in the area of teorii pola elektromagnetycznego, propagacji fal elektromagnetycznych oraz budowy i własności anten - [K1_W07]

2. A student has basic knowledge and mathematical foundations in the area of radio communications, has basic knowledge of the 2G, 3G and 4G mobile systems; A student has basic knowledge concerning the architecture and maintainance of radio communication systems and elements of tele-informtion networks, including wireless networks - [K1_W14]

Skills:

1. A student is able to solve basic problems in the area of electromagnetic fields, radio propagation, antenna design - [K1_U11]

2. A student is able to compare radio communication systems and stantards, and to select advantageous radio transmission technique or wireless standard in the given propagation and users mobility conditions. - [K1_U23]

Social competencies:

1. A student is aware of the necessity of professional approach to technical problems and responsibility for his/her proposed technical solutions - [K1_K02]
2. A student feels responsibility the designed electronic and telecommunication systems and is aware of the potential threats for other persons or society of improper use of these systems and designs - [K1_K03]
3. A student is able to formulate opinions concerning challenges of contemporary radio communications; A student is aware of the impact of rario systems and networks on the information society. - [K1_K04]

Assessment methods of study outcomes
Written exam from theory and content of the lectures (test with open questions)
Classes passing based on solved problems and written test.
Course description
1. Calculation of signal propagation and power in radio communication channels
2. Calculation of the channel parameters and receiver design
3. Calculation of the cellular systems capacity for the desired grade of service
4. Design of coverage areas for cellular base stations
Basic bibliography:
1. Krzysztof Wesołowski, Systemy radiokomunikacji ruchomej, Wydawnictwa Komunikacji i Łączności WKŁ, Warszawa 2003
2. H. Bogucka,Projektowanie i obliczenia w radiokomunikacji, Wyd. II, Wydawnictwo Politechniki Poznańskiej, Poznań 2005
Additional bibliography:
1. A. Molisch, Wireless Communication Systems, John Wiley and Sons, 2005
2. G. Stueber, Principles of Mobile Communication Systems, Kluwer Academic Publishers, 2003
3. T. S. Rappaport, Wireless Communications, Principles and Practice, Prentice Hall PTR, USA 1996

Result of average student's workload

Activity	Time (working hours)
1. Participation in classes	10
2. Individual work on solving problems	10
3. Preparation for the test	10

Student's workload

Source of workload	hours	ECTS
Total workload	30	1
Contact hours	12	1
Practical activities	30	1