

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Digital Broadcasting Systems		Code 1010812121010812682
Field of study Electronics and Telecommunications	Profile of study (general academic, practical) general academic	Year /Semester 1 / 2
Elective path/specialty Radio Communications	Subject offered in: Polish	Course (compulsory, elective) elective
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 2 Classes: - Laboratory: 2 Project/seminars: -		No. of credits 5
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) from field
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 5 100% 5 100%
Responsible for subject / lecturer: prof. dr hab. inż. Krzysztof Wesolowski email: wesolows@et.put.poznan.pl tel. 0616653812 Faculty of Electronics and Telecommunications ul. Piotrowo 3A 60-965 Poznań		Responsible for subject / lecturer: prof. dr hab. inż. Krzysztof Wesolowski email: wesolows@et.put.poznan.pl tel. 0616653812 Faculty of Electronics and Telecommunications ul. Piotrowo 3A 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Knows the principle of operation of digital transmission systems, including baseband transmission, digital modulations, signal transmission in channels, signal reception, forming the spectral properties of signals, countering channel distortions. [K1_W15] Knows rules of radio wave propagation [K1_W14] Possesses basic knowledge in satellite systems [K1_W14]
2	Skills	Is able to solve typical problems related to electromagnetic field analysis, EM wave propagation and design and implementation of antennas [K1_U11] Is able to write simulation programs in C and C++ or Matlab [K1_U13] Is able to determine basic parameters and properties of signals and telecommunication systems, under predefined constraints. [K1_U15]
3	Social competencies	Demonstrates responsibility and professionalism in solving technical problems. Is able to participate in collaborative projects. [K1_L02]
Assumptions and objectives of the course: Learning about all segments of digital transmission of digital television DVB and digital radio DAB and DRM, learning about new transmission techniques applied in such systems, describing the rules of operation of multi- and single-frequency networks, learning calculation of DVB satellite link budget		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has in-depth knowledge of radiocommunication systems as well as standards, architectures and operation of digital broadcast networks - [K2_W01] 2. Has in-depth, supported with mathematical methods, knowledge of functioning of broadcast satellite, terrestrial and cable networks, as well as basic rules of their design - [K2_W01] 3. Has a systematic, advanced knowledge of state-of-the-art techniques applied in digital radio DAB and DRM systems . - [K2_W06]		
Skills:		
1. Is able to perform calculation of satellite link budget - [K2_U09] 2. Is able to explain operation of contemporary DVB digital broadcast systems - [K2_U02] 3. Is able to efficiently model operation of digital broadcast system - [K2_U18]		
Social competencies:		

1. Is able to act as a formal head of a small group of co-workers designing reception system of digital broadcast signals - [K2_K01]
2. Understands the role of information society in the country development . - [K2_K02]
3. Understands the legal framework of Polish and international standards in the area of DVB and DAB networks. - [K2_K03]

Assessment methods of study outcomes		
Examination based on the course contents, evaluation of the report based on the work performed within laboratory excercises		
Course description		
Lectures: Rules of operation of DVB television system in its satellite, terrestrial and cable segments, DVB standard analysis, single- and multi-frequency networks, foundations of digital television network design, specification of DVB-H standards, rules of operation of digital DAB and DRM radio broadcasting		
Laboratory excercises: Design excercises aiming at modeling selected functional blocks of given DVB systems		
Basic bibliography:		
1. ETSI DVB-S, DVB-S2, DVB-T, DVB-T2, DVB-C and DVB-H Standards		
2. DAB standards		
3. DRM standards		
Additional bibliography:		
1. R. de Bruin, J. Smits, Digital Video Broadcasting. Technology, Standards, and Regulations, Artech House, 1999		
Result of average student's workload		
Activity		Time (working hours)
Student's workload		
Source of workload	hours	ECTS
Total workload	125	5
Contact hours	65	2
Practical activities	70	2