

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Studio techniques of audio processing		Code 1010842131010842692
Field of study Electronics and Telecommunications	Profile of study (general academic, practical) general academic	Year /Semester 2 / 3
Elective path/specialty Multimedia and Consumer Electronics	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: 1 Classes: - Laboratory: 2 Project/seminars: -		No. of credits 2
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 %) 2 100% 2 100%
Responsible for subject / lecturer: dr inż. Maciej Bartkowiak email: mbartkow@multimedia.edu.pl tel. 6653850 Wydział Elektroniki i Telekomunikacji ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	K1_W06, K1_W11, K1_W18, K1_W19, K1_W20, K1_W24, K1_W25
2	Skills	K1_U01, K1_U07, K1_U10, K1_U13, K1_U15, K1_U19
3	Social competencies	K1_K01, K1_K02
Assumptions and objectives of the course: Getting knowledge on audio signal processing techniques in radio, television and recording studio. Learning the principles and structure of audio equipment for spectrum and dynamics modification, generation of virtual acoustics, as well as signal enhancement for meeting broadcast standards. Acquiring a deeper knowledge about the impact of various compression techniques on audio quality. Learning quality assessment techniques for audio, measuring the distortions introduced by lossy coding.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Deep knowledge on construction and principles of audio parts in telecommunication systems - [K2_W01] 2. Structured and theoretically underpinned knowledge on compression techniques for speech and wideband audio, including applications of perceptual compression in communications via data transport networks - [K2_W14]		
Skills:		
1. Ability to analyze the operation of a multimedia system for its audio transmission path, as well as its limitations, and to gain the maximum use of the data transmission conditions offered - [K2_U03] 2. Ability to implement the audio path in VoIP and programmable radio, as well as to take into account the peculiarities of audio representation and perception, and how they impact the requirements of such systems. Ability to select appropriate tools for enhancement of an audio signal distorted or interfered by noise - [K2_U12, K2_U13, K2_U16]		
Social competencies:		
1. Ability of self-learning (textbooks, computer programs) - [K2_K04] 2. Understanding the non-technical factors of engineering - [K2_K05] 3. Knowing the responsibility for the electronic and telecommunication systems being designed - [K2_K06]		

Assessment methods of study outcomes		
1. Written exam 2. Reports from the lab exercises 3. Check of the activity during laboratory exercises		
Course description		
<p>Basic components of audio processing path in a studio (the structure of a mixing console, patching fields, signal recorders, converters, synchronizers, and monitoring setup).</p> <p>Data formats of compressed and non-compressed digital audio in studio environment. Two and multichannel digital audio interfaces. Multitrack digital recording systems.</p> <p>Signal processing tools and equipment in recording and broadcasting studio (equalizers, dynamic processors, reverberation processors). Operating principles and structure of common equipment. Processing impact on subjective audio quality. Dangers and risks related to dynamic compression during radio and television broadcast.</p> <p>Sound synthesis in electronic musical instruments and studio equipment for scoring and recording. Architecture of a Digital Audio Workstation and its applications to signal processing in studio work.</p>		
Basic bibliography:		
1. The Art Of Digital Audio, J. Watkinson, Focal Press, 2001 2. Audio Post-production in Video and Film, T. Amyes, Focal Press, 1998 3. Handbook of Recording Engineering, Kluwer, 2003		
Additional bibliography:		
1. DAFX, Digital Audio Effects, Udo Zoelzer (red.), Wiley, 2002 2. Audio Signal Processing and Coding, A. Spanias, T. Painter, V. Atti, Wiley, 2007		
Result of average student's workload		
Activity	Time (working hours)	
1. Lecturers and laboratories	30	
2. Preparation for laboratories	20	
3. Consultations	2	
4. Preparation to the exam	5	
5. Exam	3	
Student's workload		
Source of workload	hours	ECTS
Total workload	50	2
Contact hours	35	1
Practical activities	30	1