



Subject card

Subject name and code	Studio Measurements, PG_00048327						
Field of study	Electronics and Telecommunications						
Date of commencement of studies	February 2025	Academic year of realisation of subject			2025/2026		
Education level	second-cycle studies	Subject group			Optional subject group Specialty subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Multimedia Systems -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Grzegorz Szwoch					
	Teachers	dr hab. inż. Grzegorz Szwoch					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		4.0		16.0	50
Subject objectives	The aim is to teach students how to perform measurements in studio technology. Students learn about modern measurement equipment, methodology of acoustic and electroacoustic measurements and sound quality assessment. During the laboratory classes, students perform audio measurements on their own.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U12] is able, to an increased extent, to analyze the operation of components and systems related to the field of study, as well as to measure their parameters and study their technical characteristics, and to plan and carry out experiments related to the field of study, including computer simulations, interpret the obtained results and draw conclusions	Student knows how to evaluate the obtained test results in order to assess the quality of systems and devices used in studio technology. Student knows how to create reports with test results. Student knows how to interpret the obtained test results and how to evaluate the tested unit for a specific application in studio technology.	[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	[K7_U03] can design, according to required specifications, and make a complex device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	Student knows how to create a test system necessary to measure the quality of devices and systems used in studio technology. Student knows how to perform a test in a way that the obtained results may be used for assessment of the tested unit.	[SU4] Assessment of ability to use methods and tools
	[K7_W03] knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	Student knows the most important parameters that describe the quality of devices and systems used in studio technology. Student understands the relationship between the test results and the usefulness of the tested system in a specific studio technology application.	[SW1] Assessment of factual knowledge

Subject contents	<ol style="list-style-type: none"> 1. Introduction 2. Computer systems for electroacoustic measurements 3. Test signals and measurement units 4. Characteristics of the electroacoustic systems 5. Frequency response tests 6. Phase distortion tests 7. Nonlinear distortion tests 8. Intermodulation distortion tests 9. Other tests: signal-to-noise, crosstalk and separation, frequency, phase, impedance 10. Digital signal generators and analysers 11. Measurements of digital sound systems 12. Testing compressors, expanders and other studio devices 13. Testing microphones, loudspeakers and earphones 14. Quasi-anechoic measurements in enclosed spaces 15. Digital systems for real-time measurements 16. Subjective testing of sound quality 17. Testing quality of the encodec speech and music 18. Video measurements 											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Subject passing criteria</th> <th style="width: 33%;">Passing threshold</th> <th style="width: 33%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Final exam</td> <td>51.0%</td> <td>50.0%</td> </tr> <tr> <td>Practical exercises</td> <td>51.0%</td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Final exam	51.0%	50.0%	Practical exercises	51.0%	50.0%
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Final exam	51.0%	50.0%										
Practical exercises	51.0%	50.0%										
Recommended reading	Basic literature	Lecture presentations and supplementary materials: http://sound.eti.pg.gda.pl/student/materialy.html Instructions for laboratory classes: http://sound.eti.pg.gda.pl/student/laboratoria.html										

	Supplementary literature	<p>J. Sereda: Pomiary w elektroakustyce. WKiŁ, Warszawa 1981.</p> <p>K. Blair Benson: Audio Engineering Handbook. McGraw Hill, 1988.</p> <p>H.B. Miller: Acoustical measurements. HRP Company, Pelsynwania 1982.</p> <p>Z. Żyszkowski: Miernictwo akustyczne. WNT, Warszawa 1987.</p> <p>G. Davis, R. Jones: The Sound Reinforcement Handbook. HP Hal Leonard Publishing Corp., 1990.</p> <p>J. Sereda: Pomiary w elektroakustyce. WKiŁ, Warszawa 1981.</p>
Example issues/ example questions/ tasks being completed	eResources addresses	Adresy na platformie eNauczanie:
Work placement	Not applicable	

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