STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Digital image and audio**		Code **1010804181010844245**
Field of study **Electronics and Telecommunications**	Profile of study (general academic, practical) **general academic**	Year /Semester **4 / 8**
Elective path/specialty **-**	Subject offered in: **Polish**	Course (compulsory, elective) **elective**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **part-time**	

No. of hours				No. of credits **4**
Lecture: **20**	Classes: **-**	Laboratory: **20**	Project/seminars: **-**	

Status of the course in the study program (Basic, major, other) **other**	(university-wide, from another field) **university-wide**

Education areas and fields of science and art
 	
technical sciences
    Technical sciences
	ECTS distribution (number and %**)**
	
	4 100%
	    4 100%

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	1. Has a systematic knowledge of mathematical analysis, algebra and theory of probability (K1_W01) 2. Has a systematic knowledge, together with necessary mathematical background, of 1D signal theory; this knowledge allows him/her to understand the representation of signals and signal analysis in time domain and frequency domain (K1_W06) 3. Knows the principles of construction of computer programs ; has knowledge from the area of computing science; knows the syntax of C, C++, C#, MatLab (K1_W09)
2	**Skills**	1. Is able to extract information from Polish or English language literature, databases and other sources. Is able to synthesize gathered information, draw conclusions, and justify opinions (K1_U01) 2. Demonstrates the ability to solve problems related to signal analysis in time domain and frequency (K1_U10) 3. Is able to write software for basic computational algorithms, using popular programming languages (e.g. Matlab, C) (K1_U13)
3	**Social competencies**	1. Is aware of the limitations of his/her current knowledge and skills; is committed to further self-study (K1_K01)

Assumptions and objectives of the course:

Familiarize students with the state of the art multimedia techniques, with methods of image and video analysis, with techniques of image and video compression and methods of their presentation. Familiarize students with methods of audio and speech processing and compression.

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

Knowledge:

1. The student has skills associated with the state of the art multimedia techniques, with methods of image and video analysis, knows techniques of image, video, and audio (basics) compression, and is familiar with image and video presentation solutions. - [K1_W11]

2. The student has skills associated with techniques of audio and speech processing and compression. - [K1_W11]

Skills:

1. The student is able to solve basic problems associated with methods of image and video analysis, and also with methods of image, video, and audio (basics) compression. The student is aware of constraints of the methods. - [K1_U16]

2. The student is able to solve technical problems associated with audio and speech processing and compression. - [K1_U16]

Social competencies:
1. The student understands the need for continuous training in order to improve skills. - [K1_K01]

Assessment methods of study outcomes

Written and/or oral exam from material presented during lectures.

Reports from thematically homogenous laboratory exercises and/or an exams (+ project).

Course description

Lectures:
- basics of one-dimensional signal processing
- basics of image technology
- image and video representation and compression
- basics of audio and speech processing
- techniques of audio and speech compression

Laboratories:
Laboratory excercises are related to selected topics that are presented during lectures.

Basic bibliography:

1. Marek Domański, ?Obraz cyfrowy?, Wydawnictwa Komunikacji i Łączności, 2011
2. D. Salomon, G. Motta, Handbook of Data Compression, Springer-Verlag, 2010
3. K. Sayood, Introduction to Data Compression, Morgan Kaufmann, 2012

Additional bibliography:

1. A. Czyżewski ?Dźwięk cyfrowy?

Result of average student's workload

Activity	Time (working hours)
1. Lectures (20 hours) + laboratories (20 hours)	40
2. Consultation of lectures, laboratories + project	20
3. The study of the literature, preparation for laboratory and preparing for classes	60

Student's workload

Source of workload	hours	ECTS
Total workload	100	4
Contact hours	65	2
Practical activities	40	2