POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Multimedia technology [S2EiT2E-TIT>TM]

Course

Field of study	Year/Semester
Electronics and Telecommunications	1/1
Area of study (specialization)	Profile of study
Information and Communication Technologies	general academic
Level of study	Course offered in
second-cycle	english
Form of study	Requirements
full-time	elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
30	30	0
Tutorials	Projects/seminars	
0	0	

Number of credit points

5,00

Coordinators

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Lecturers

dr inż. Tomasz Grajek
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dr hab. inż. Adrian Dziembowski prof. PP
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Prerequisites

Has a structured and theoretically underpinned knowledge on one-dimensional signal theory which is necessary for understanding the representations of signals in time domain and frequency domain. Has a structured and theoretically underpinned knowledge on basic methods of digital signal processing. Can solve typical problems related to signal analysis in time and frequency domains. Is able to obtain information from literature and databases as well as other sources in English; is able to integrate obtained information, interpret it, draw conclusions and justify opinions. Knows the limits of his own knowledge and abilities, understands the need for ongoing education.

Course objective

The goal is to teach the fundamentals of multimedia technology. The course is particularly advisable for students who did not attend multimedia course before or the course was limited. The course has similar goals as "Fundamentals of multimedia", but it is multimedia technolgy-oriented.

Course-related learning outcomes

Knowledge:
Have a structured and mathematicaly underpinned knowledge on acquisition, human perception, quality assessment, processing, digital representations, compression and transmission of multimedia data.

Skills:
Understanding of the technical conditions for transmission, storage and presentation of multimedia data. Can formulate appropriate basic requirements for technical systems implementing multimedia services.

Social competences:
Knowing the limits of own knowledge and skills, understanding the need for ongoing education. Have awareness of the necessity of professional approach to solving technical problems and take responsibility for the proposed technical solutions.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
The knowledge acquired in the lecture is verified on the written and / or oral exam. The exam consists of several open questions with different levels of difficulty with the assigned number of points. The questions relate to the content presented during the lectures. Credit threshold: 50% of points.

Laboratory - the knowledge of students is verified through the ongoing assessment of student activity during laboratories and/or through the reports of tasks performed during the laboratories. Performed tasks are related to the processing and encoding of audiovisual data. Credit threshold: 50% of points.

Programme content

Lecture and laboratory topics:
Multimedia and multimedia communication systems - introduction, basic terminology.
Multimedia data representations. Lossless and lossy data compression. Entropy coding. Dictionary coding.
Digital image processing.
Digital lossless and lossy compression of images.
Video compression - introduction, basic tools, general scheme. Video compression standards.
Basic representations of audio signals.
Basic speech and audio compression standards.
Multimedia containers.

Teaching methods

Lecture - multimedia presentation, illustrated with examples on the board. Slides available to students after the lecture.
Laboratory - computer classes using software that allows advanced simulation and analysis of audiovisual signals and systems. Solving problems given by the teacher and / or specified in the laboratory instruction. Interpretation of the received solution and drawing conclusions.

Bibliography

Basic
V. Madisetti (ed.), Video, Speech, and Audio Signal Processing and Associated Standards (The Digital Signal Processing Handbook, Second Edition), CRC Press, 2009
J-R. Ohm, Multimedia Communication Technology: Representation, Transmission and Identification of Multimedia Signals (Signals and Communication Technology), Springer, 2004
E. Carne, Connections for the Digital Age: Multimedia Communications for Mobile, Wiley, 2011
Additional
D. Karwowski, T. Grajek, et al., 20 Years of Progress in Video Compression - from MPEG-1 to MPEG-H HEVC. General View on the Path of Video Coding Development, Image Processing and Communications Challenges 8, Springer International, 2016, pp. 3-15

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	70	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	55	2,00