COURSE DESCRIPTION CARD - SYLLABUS

Course name
Multimedia Data Transfer [S1Teleinf1>PDM]

Course

Field of study
Teleinformatics

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes
15

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

dr hab. inż. Dawid Mieloch prof. PP
dawid.mieloch@put.poznan.pl

Lecturers

Prerequisites

The student starting this course should have basic knowledge of the basics of telecommunications, digital signal processing and introduction to multimedia. He should have the ability to perform calculations using a mathematical apparatus in the field of mathematical analysis and probability calculus, and to obtain information from the indicated sources. He should also understand the need to expand his competences. In addition, in the field of social competences, the student must present attitudes such as honesty, responsibility, perseverance, cognitive curiosity, creativity, personal culture, respect for other people.

Course objective

1. Provide students with basic knowledge in the field of multimedia data transfer. 2. Developing students' skills in solving basic computational problems related to multimedia data transfer systems. 3. Shaping students' skills in acquiring knowledge about currently implemented solutions for the transfer of multimedia data.

Course-related learning outcomes

Knowledge:
1. Has an ordered, mathematically founded knowledge of the basics of telecommunications theory

necessary for understanding, analysis and evaluation of the operation of modern digital teleinformatic networks for the transmission of multimedia data. K1_W08

2. Has a basic and structured knowledge of the construction, operation and evaluation of the efficiency of teleinformatic networks as well as their standards and development directions from the point of view of transmitting multimedia data. K1_W10

3. Has knowledge of the structure and operation of ICT systems for the provision of multimedia services, including processing, compression and transmission of images, audio and speech, as well as searching, securing and using multimedia content. K1_W20

Skills:
1. Can organize networks and supervise their work, and use technologies that enable safe transmission of multimedia data in ICT networks. K1_U15

2. Can analyze the operation of transmitters and receivers of digital signals and design the basic blocks of the transmitter and receiver in digital multimedia data transfer systems. K1_U08

3. Can define the basic requirements for teleinformatic systems providing multimedia services, implement in multimedia systems the most commonly used effects of three-dimensional graphics and design image and sound transmission systems. K1_U26

Social competences:
1. Notices changes resulting from technological progress and understands the need to learn about new standards of ICT networks. K1_K01

2. He knows the limitations of his own knowledge and understands the need to update it. It is open to the possibility of continuous training and improvement of professional, personal and social competences. K1_K02

3. Has a sense of responsibility for the designed ICT systems and is aware of social risks in the event of inadequate design or implementation. K1_K08

4. Understands the importance of shaping the information society for the development of the country. K1_K09

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

a) in the lecture, verification of the assumed learning outcomes is carried out by:
• assessment of the knowledge demonstrated during the exam. The exam is about answering questions and solving problems. To get the grade 3.0 it is necessary to get a minimum of 50% of the points; 3.5 - 60% of points; 4.0 - 70% of points; 4.5 - 80% of points; 5.0 - 90% points.
b) in the laboratory, verification of the assumed learning outcomes is carried out by:
• evaluation of the performance of laboratory tasks,
• obtaining additional points for activity during classes.

Programme content

1. Multimedia data
2. Review of multimedia data transfer methods
3. Streaming multimedia data
4. Image and audio coding
5. Transmission of omnidirectional images
6. Metadata of multimedia data
1. Multimedia data
 What are multimedia data?
 The importance of the issue
 Overview of multimedia transmission problems
 The multitude and variety of data sources and receivers
 Compatibility and standardization issues
2. Review of multimedia data transfer methods
 Television services
 Cable television
 Terrestrial television
 Satellite television
 Digital radio (DAB)

Internet services
IPTV
Streaming media: Youtube, Netflix, Spotify
3. Streaming multimedia data
Examples of efficient streaming methods, in particular MPEG DASH (Dynamic Adaptive Streaming over HTTP), Apple HLS, Microsoft Silverlight
4. Image and audio coding
Selected coding issues
5. Transmission of omnidirectional images
Introduction to virtual reality
6. Metadata of multimedia data
Searching for multimedia data
MPEG CDVS

Teaching methods

Lecture supported by the presentation of slides and examples of audio, images, and videos.

Bibliography

Basic:
D. Bull – Communicating Pictures, Elsevier, 2014
B. Bing – Next-Generation Video Coding and Streaming,Wiley, 2015

Additional:
M. Domański – Obraz cyfrowy, Wydawnictwa Komunikacji i Łączności WKŁ, 2011
D. Karwowski – Zrozumieć kompresję obrazu, www.zrozumieckompresje.pl, 2019
L. Chariglione – The MPEG Representation of Digital Media, Springer, 2012
Breakdown of average student's workload
Hours ECTS
Total workload 86 3.0
Classes requiring direct contact with the teacher 45 2.0
Student's own work (preparation for tests, preparation for laboratory 41 1.0
classes, literature studies)

Breakdown of average student's workload

	Hours	ECTS
Total workload	86	3,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	41	1,00