

## DESCRIPTION OF THE STUDY SUBJECT

### Title

<b>MULTIMEDIA SIGNALS</b>
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### Scope of the subject

Semester	Mode of studies	Structure*					Total number of hours	Number of credits	Group and type of subjects
		L	PS	Lw	C	S			
II	Full-time	16	3	14	6	40	79	3	Compulsory subjects of the study field
II	Part-time	6	-	12	21	40	79	3	

\*L – lectures, PS – practical activities, seminars, LW – laboratory work, PR – practice, CP – course paper, C – consultations, S – self-study

### Aim of the subject

To get familiarised with audio and video recording devices, their parameters and output signals. To understand basic principles of audio and video transfer by various communication media and analyze the most popular standards of transfer of such data. To be able to distinguish between these standards analyzing the given hardware. To be able to choose the appropriate multimedia data transfer interface and components of recording, amplifying and playback hardware.
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### Necessary background knowledge for studying the subject

Students shall have heard the subject physics.
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### Content of the subject

Title of the topic and description of the content	Number of contact hours					Total number of hours
	L	PS	Lw	C	S	
1. Analogue and digital signals Analogue signals, their examples and parameters; digital signals, their examples and parameters; comparison of analogue and digital signals; electromagnetic noise, its impact on analogue and digital signals.	2	-	-	-	-	2
Laboratory works and their defence. 1. Monitoring of analogue signals by oscilloscope; 2. Monitoring of digital signals by oscilloscope; 3. The influence of different types of noise on signals.	-	-	6	1	8	15
2. Audio and video recording devices Microphones, their types, parameters and output signals; video cameras, their types, data storage and output standards; video recording equipment.	4	-	-	-	-	4
Laboratory work and its defence. 4. Measurement of the parameters of the microphone output signal.	-	-	2	-	2	4
3. Multimedia signal transmission standards Audio signal transmission standards (ADAT, AES / EBU (AES3), IEC 60958, S / PDIF, MIDI) and used connections (plug and tightened or crimp contacts, DB25, DIN, mini-DIN, RCA, Speakers, 6,35mm, 3,5mm, 2,5mm, XLR, Toslink / EIAJ), and cables; Video and multimedia signal transmission and storage standards (YPBPR, CVBS, S-Video, DB13W3, VGA, DVI, HDMI, DMS-59, PAL, NTSC, SECAM, SDI, mini-DVI, mini-VGA, EGA, RGB, RGBI, VESA, VHS, S-VHS, D-VHS, DV, HDV, Digital8, MICROMV, Blu-ray, HD-DVD, IPTV, IEEE-1394 and other.), and used connections (RCA, BNC, D-Terminal, the F-type (9,52mm), mini-DIN, D-Sub, DVI, M1-DA, SCART, DIN 1.0 / 2.3, mini-DVI, micro-DVI, DisplayPort and other), and cables; lighting control protocols and hardware	4	-	-	-	-	4
Independent work No. 1 Identification of device interfaces analyzing documentation.	-	-	-	1	8	9
Laboratory work and its defence: 5. Identification of device interfaces using the inspection method.	-	-	2	-	2	4
Seminar. Functions of the multimedia device and presentation of its parameters.	-	3	-	-	4	7

Title of the topic and description of the content	Number of contact hours				S	Total number of hours
	L	PS	Lw	C		
4. Intermediate devices of audio and video signal control, branching, amplifying, conversion. Amplifiers, switches, mixers, converters, active and passive filters; preparation of audio and video recording and playback systems for work (component selection, combining, adjustment), a MIDI interface.	4	-	-	1	-	5
Laboratory works and their defence. 6. Preparation of sound playback system for work. 7. Selection of multimedia system components and preparation for work.	-	-	4	1	4	9
5. Lighting equipment and its control standards. The main types of lighting devices and their purpose; the DMX512 interface for control of lighting devices by electronic or computerized way.	2	-	-	-	2	4
<b>Preparation and taking the exam</b>				2	10	12
<b>Total number of hours</b>	<b>16</b>	<b>3</b>	<b>14</b>	<b>6</b>	<b>40</b>	<b>79</b>

#### Assessment of learning outcomes

Ten-point criteria-based assessment system as well as cumulative assessment using individual cumulative index (ICI) are applied. The overall grade is the sum of grades for intermediate accountings and examination (E) multiplied by weighted coefficients.

ICI = 0,4 E + 0,3 Lw + 0,2 Iw + 0,1 O, where Iw – independent work, Lw – laboratory works, O – oral presentation.

#### Recommended literature

Key literature						
No.	Year of publishing	Author(s) and title of the publication	Publishing house	Number of copies		
				ŠSSC library	Other premises	Other libraries *
1.	2014	Lyons C. Audio Systems Guide: video and film production. A SHURE Educational Publication	SHURE Inc.	<a href="http://cdn.shure.com/publication/upload/849/audio-systems-guide-for-video-and-film-production-english.pdf">http://cdn.shure.com/publication/upload/849/audio-systems-guide-for-video-and-film-production-english.pdf</a>		
2.	2007	Jack K. Video Demystified, 5th Edition	Elsevier Newness	<a href="http://www.r-5.org/files/books/computers/algo-list/compression/Keith_Jack-Video_Demystified-EN.pdf">http://www.r-5.org/files/books/computers/algo-list/compression/Keith_Jack-Video_Demystified-EN.pdf</a>		
3.	2002	Sanjeev R. Kulkarni. Lecture Notes for ELE201 Introduction to Electrical Signals and Systems. Chapter 2: Basics of Signals	Princeton University	<a href="https://www.princeton.edu/~cuff/ele201/kulkarni_text/signals.pdf">https://www.princeton.edu/~cuff/ele201/kulkarni_text/signals.pdf</a>		
Additional literature						
No.	Year of publishing	Author(s) and title of the publication	Publishing house and/or internet link			
1.	2014	iZotope. Mixing with Izotope: Principles, Tips and Techniques	<a href="http://downloads.izotope.com/guides/iZotope-Mixing-Guide-Principles-Tips-Techniques.pdf">http://downloads.izotope.com/guides/iZotope-Mixing-Guide-Principles-Tips-Techniques.pdf</a>			
2.	2008	NEC: Video Display Interfaces	<a href="https://www.necdisplay.com/Documents/WhitePapers/Video_Display_Interfaces.pdf">https://www.necdisplay.com/Documents/WhitePapers/Video_Display_Interfaces.pdf</a>			
3.	2002	Maxim Integrated: Video Basics: Tutorial Nr. 734	<a href="http://pdfserv.maximintegrated.com/en/an/AN734.pdf">http://pdfserv.maximintegrated.com/en/an/AN734.pdf</a>			

\* ŠAVB – Šiauliai Region Povilas Višinskis Public Library, ŠU – library of Šiauliai University

#### Required material resources and their short description

- **Equipment (devices):** computers (16 units), computers connected to the local network and connected to the Internet, microphones, mixers, amplifiers, speakers, cables, oscilloscopes, multimedia equipment.

#### The description prepared by:

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