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Strengthening capacities for the implementation of dual education in BH higher education
(DUALSCI)

4.7. Equipment purchased and installed - Report

Mostar, 10.05.2021.

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Project duration:	36 months

Abstract	This is the report about public procurement of equipment on the project DUALSCI. The procurement is successfully finished and this report represents the description of the procedure, from the start to the end.
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Version	Date	Revision description	Partner responsible
V 1.0	10.05.2021.	First draft	SUM
V 1.1	13.05.2021.	Minor corrections	UNS

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Report:

The University of Mostar is a lead organization of Work package 4 in the project “*Strengthening capacities for the implementation of dual education in BH higher education / DUALSC*”.

In this WP University of Mostar had the following obligation *Purchase of equipment*. Project manager prof. Željko Stojkić initiated the first online meeting using the Meet app on **26th March 2020** (the meeting was online due to covid pandemic). On that meeting following members were attended: Željko Stojkić, Remzo Dedić, Boris Crnokić, Nikola Knezović, Mirela Jurić, Igor Bošnjak, Ivan Bevanda, Petar Marić, Darko Šunjić, and Krešimir Rakić. They talked about: discussion on the topic of the project, defining obligations on WP4, purchasing of equipment, and assignments for further activities.

Due to task *4.4 Purchase of equipment*, the purchase of equipment for the project was discussed. Since the purchase of equipment is planned in WP4 and the University of Mostar is the leader of this package Mirela Jurić said that she was in contact with Mirko Savić and that the University must initiate the public procurement process for other project partners/universities (HEIs) in BiH: the University of Zenica, University of Sarajevo and the University of East Sarajevo. It was agreed that before launching the public procurement SUM had to contact the project partners and define the required technical specifications for the procurement. The equipment should primarily serve for the completion of those study programs that will go as pilot study programs with dual education. It was agreed that when the public procurement starts, that then Mr. Ivo Karačić from the University and Miss Selena Knežić from FSRE will be hired. For the part of the technical specifications for SUM equipment, there will technical support from FSRE engaged.

Members of the project team sent a notification to all higher education institutions in BiH to make changes to the technical specifications of the equipment that needs to be procured. The new and amended specification, which each of the universities will adapt to their study programs, will be sent to Mirko Savić and then to Brussels for approval. After all the institutions had sent their specifications, they were sent to Brussels. The equipment list was approved on **July 17th, 2020** by Giulia Moro, Project Adviser.

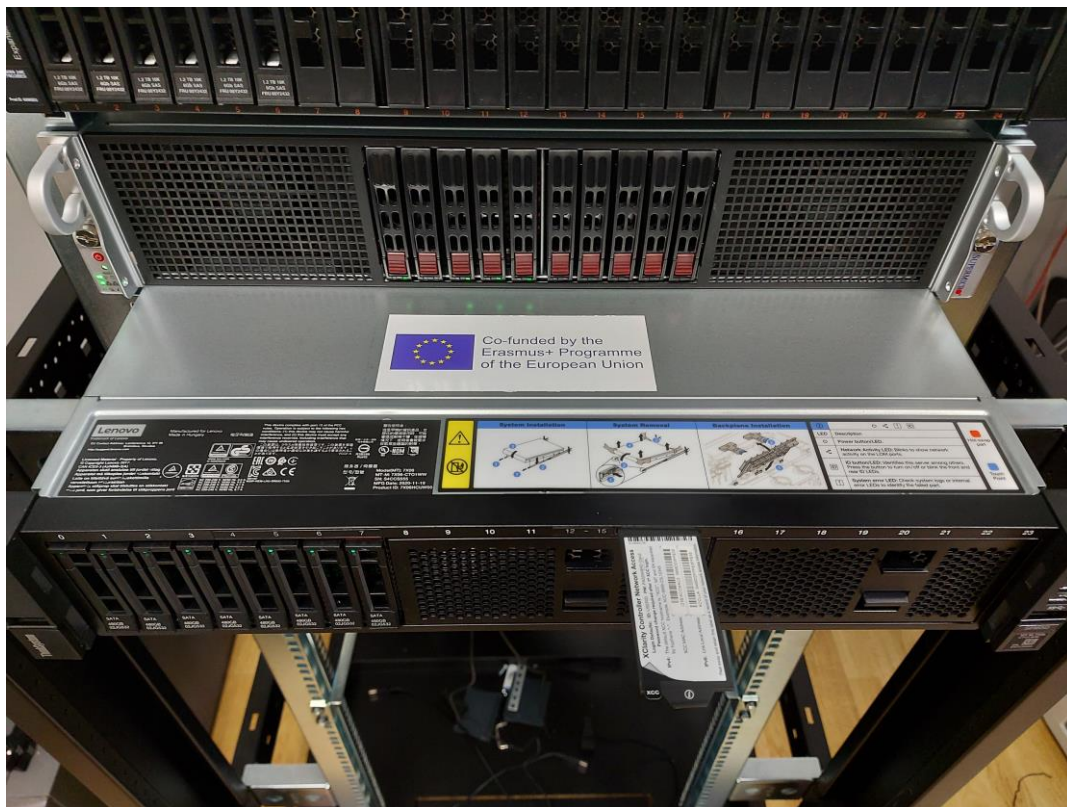
In addition, SUM has prepared a document, a draft agreement on public procurement, which, with minor changes, was accepted by all higher education institutions. The document was sent for signature first to the University of Zenica, then to the University of Sarajevo, and then to the University of East Sarajevo and

after it was signed and returned to University of Mostar, a public procurement procedure was initiated on **July 31th 2020**.

On **September 11, 2020**, the opening of bids was organized at the University of Mostar, where it was established that for LOT1 (SUM), LOT3 (UNSA), and LOT4 (UNZE) they had only one bidder, and LOT2 (UIS) had two bidders. For LOT1, LOT3, and LOT4 a contract was signed with the company Katarina d.o.o. and for LOT 2 the contract was signed with the company DOO NETWORK I Bijeljina. All contracts were signed by the end of **October 2020**.

Due to the coronavirus pandemic, there were minor waits for equipment delivery. As it was and expected, all higher education institutions accepted the extension of the delivery deadline and by **mid-April 2021**, all equipment was delivered to all higher education institutions.

Attached you can find a couple of examples of the equipment that was delivered and in the end, you can find the list of all equipment bought for all four HEIs.







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Strengthening capacities for the implementation of dual education in BH higher education (DUALSCI)

	Partner No	Nature, type	Amount	Amount Excluding VAT (EUR)	Total (EUR)	
University of Zenica	Preparation	P8	Server (Lenovo ThinkSystem SR650 or equivalent):	1	5.000,00 EUR	5.000,00
University of Zenica	Preparation	P8	Hard drive for server (ThinkServer 2.5" 1TB 7.2K Enterprise SATA or equivalent)	4	250,00 EUR	1.000,00
University of Zenica	Preparation	P8	ServerRack (HPE 42U Rack or equivalent)	1	1.000,00 EUR	1.000,00
University of Zenica	Preparation	P8	Keyboard and display for Server Rack (HP TFT7600 or equivalent)	1	500,00 EUR	500,00
University of Zenica	Preparation	P8	All in one computer with OS (HP 24-f0049ny AiO or equivalent)	30	866,67 EUR	26.000,00
University of Zenica	Preparation	P8	Switch (TP-link T1700G-28TQ or equivalent)	1	1.000,00 EUR	1.000,00
University of Zenica	Preparation	P8	UPS 3000VA/2700W (EATON 3000VA/2700W or equivalent)	1	1.000,00 EUR	1.000,00
University of Zenica	Preparation	P8	Portable interactive whiteboard (SMART KAPP 42 or equivalent)	4	500,00 EUR	2.000,00
University of Zenica	Preparation	P8	Notebook with OS (Dell Inspiron 14-5491 or equivalent)	10	1.235,00 EUR	12.350,00
University of Zenica	Preparation	P8	Thermal infrared camera (FLIR E6-XT or equivalent)	1	3.150,00 EUR	3.150,00
University of Zenica	Preparation	P8	3D printer (Form 3 or equivalent)	1	4.000,00 EUR	4.000,00

				Total (UNZE)	57.000,00 €	
University of Sarajevo	Preparation	P6	Server Equivalent to Server HP DL360 Gen9 E5-2630v3 (Xeon 8 core, 16GB) - HPE DL360 Gen10; 8SFF (2x Intel Xeon-Silver 4208/8 core, 128 GB)	1	5.969,60	5.970,00
University of Sarajevo	Preparation	P6	Rack hard Drive Equivalent to HPE 1TB SATA 6G Midline 7.2K SFF - HPE 1TB SATA 6G Midline 7.2K SFF	4	313,83	1.256,00
University of Sarajevo	Preparation	P6	Laptop Equivalent to HP EliteBook 840 G4 x 17 pcs - HP IDS UMA i5-8265U 840 G6 BNBPC Laptop	17	911,24	15.490,00
University of Sarajevo	Preparation	P6	All-in-One workstation with OS Equivalent to HP 24-e005ny 8GB 256GB SSD x 30 pcs - HP all in one 24-dp0004ny 8GB 256GB SSD	30	730,73	21.923,00
University of Sarajevo	Preparation	P6	Portable Interactive Whiteboard - SMART Board MX165,	3	2.153,73	7.461,00
University of Sarajevo	Preparation	P6	SBOX FS-446 TV bracket	3	276,91	900,00
University of Sarajevo	Preparation	P6	Switch Equivalent to Cisco SG250-26P-K9, 26-Port 10/100/1000 Smart PoE x 1 pc - Cisco SG250-26P 26-port Gigabit PoE Switch	1	754,83	1.000,00
University of Sarajevo	Preparation	P6	USB Equivalent to PowerWalker 3000VA/2700W - EATON UPS 1/1phase, 3kVA - 5PX 3000i RT3U	1	778,93	1.000,00
University of Sarajevo	Preparation	P6	Rackmount Keyboard and Monitor Equivalent to HP TFT7600 - HPE LCD 8500 1U Console INTL Kit	1	794,83	1.000,00

University of Sarajevo	Preparation	P6	Server Rack Equivalent to HPE 14U Advanced Shock Rack - HPE 22U 600x1075mm Adv G2 Kit Pllt Rack	1	974,31	1.000,00	
						Total (UNSA)	57.000,00 €
University of East Sarajevo	Preparation	P5	SERVER (RACK 2U) with the following minimum characteristics: Processor min.: Number of Cores: 10, Number of Threads: 20, Cache: 13, Up to 3.2GHz Memory: 8x 16GB DDR4 2666 MHz (1Rx4 1.2V) RDIMM or more; RAID Storage Controller: min. 2GB NV cache memory; HDD: 4x 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD or more; Operating system & Software: None; Min. 12x 3.5-inch disk slots front Min. 2x 3.5-inch disk slots rear Network: 4x GbE RJ-45, 1x Management interface; Ports: Front: 1 x Dedicated iDRAC Direct USB, 1 x USB 2.0, 1 x Video; Rear: 1 x Dedicated iDRAC network port, 1 x Serial, 2 x USB 3.0, 1 x Video Optical drive: DVD-RW eks;Redudant power min: 2 x 750W; Included power cables; Garancija: 36 mjeseci	1	5100	5.100,00	

University of East Sarajevo	Preparation	P5	<p>Interactive projector with the following minimum features:</p> <ul style="list-style-type: none"> * Light source: Laser minimum durability 20,000 hours in normal mode * Technology: 3LCD * Color light output: 5,000 lumens or more * Native resolution: Full HD 1920x1080, 1080p, 16: 9 aspect ratio * Contrast: 2,500,000: 1 or more * Projection size: minimum 100 inches from a distance of 0.6m or less, supported minimum 120 "in 16: 6 aspect ratio, supported connection of multiple projectors into one unit (Edge Blending). * Connectivity: 3x HDMI in, 1x HDMI out, 2x VGA in, 1x VGA out, Component in, 3x Audio in (stereo), 1x Audio out (stereo), 1x Microphone in, 2x USB 2.0 Type A, 2x USB 2.0 Type B, Powered USB, RS-232C, LAN (RJ45) integrated, Integrated wireless LAN 802.11a / b / g / n / ac with support for Miracast, Wi-Fi Direct, HDBaseT * Interaction options: Supported finger and interactive pen interaction * Interactive pens: Supply a 	1	2600	2.600,00
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			<p>minimum of two pens with dual function and quick change function button</p> <ul style="list-style-type: none">* Speaker: Integrated, minimum 16W* Security: Kensington lock, Control panel lock, Password lock, Padlock, Wireless LAN security* Adjustment options: Split-Screen function, movable split-screen, whiteboard sharing function, automatic calibration, custom logo setting, digital zoom, document camera compatible, support for a minimum of two interactive pens, email notifications, interactive OSD menu, network administration, computerless writing, Quick Corner setting, Screen Mirroring, Screen share, Arc Correction, auto on / off, CEC compliant* Control: Using the remote control and via the manufacturer's remote monitoring software* Power consumption: 370W or less* Noise in normal operation: 37 dB or less* Software: Software included for collaboration with the ability to wirelessly connect at least 50 devices to the projector, one monitoring account to approve the connection. The software must be			
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			<p>supported on Windows, Android, iOS and Chromebook platforms without additional licenses. The software must have all the functionalities unlocked with the possibility of updating for a minimum period of 5 years. Deliver on CD or provide a web address to the manufacturer's website where the software can be downloaded</p> <p>* Accessories: The projector must be supplied with a remote control, two interactive pens, a wall-mounted pen holder, a wall-mounted control panel, a set of replacement pen heads and a projector wall mount.</p> <p>* Warranty: Minimum 5 years or 12,000 working hours with authorized service provided in BiH.</p> <p>* The price includes installation and calibration of equipment.</p>			
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University of East Sarajevo	Preparation	P5	<p>WRITING BOARD with the following minimum characteristics:</p> <p>Height: 1200 mm, Width: 2000 mm; Writing surface: Glass enamel; Material: Aluminum; Function: With magnetic function, Weight: 30 kg</p>	1	176,97	176,97
University of East Sarajevo	Preparation	P5	<p>52-port Gigabit Smart Switch with the following minimum characteristics:- 48 x 10/100/1000Mbps PoE Auto-Negotiating Ports- 4x 10G SFP+ ports- enhanced security, PoE +, and advanced traffic management.- Rest: Static route, Auto Surveillance VLAN, Auto Voice VLAN, Dual images, Dual configuration files, Switching Capacity 176 Gbps, Max power consumption 443.6W (PoE On), 57.2W (PoE Off), Half-/Full-Duplex, auto-negotiation, Auto MDI/MDIX, IEEE 802.3x Flow Control, 802.3ad Link Aggregation, Asymmetric VLAN, 802.1p priority queues, MAC/IP-based ACL , 802.1X port-base Access Control, Port Security, LLDP, LLDP-MED, Smart Binding, Traffic Segmentation.Warranty: 12 months</p>	1	1020	1.020,00

University of East Sarajevo	Preparation	P5	<p>Brand name computer with the following minimum characteristics:</p> <p>Processor: Number of cores: min 6; Number of threads: min 6; Frequency: min 2.90 GHz; Maximum frequency: min 4.10 GHz; Cache: min 9 MB; Supported memory: min DDR4-2666; RAM: Type min DDR4, Speed min 2666 MHz, Capacity min 8 GB, expandable up to 32GB; Solid state drive: Capacity min 256 GB; PCIe NVMe interface, Format M.2; HDD: Capacity min 1 TB, Speed min 5400 RPM; Graphics Card: Integrated; Tower case; Power supply: min. 270W Optical drive: DVD-RW OS: Free DOS Connections: min. USB 3.1 Gen 1 x 2, USB 2.0 x 4, Headset Port x 1, Audio Interface x 1, HDMI Type A x 1, VGA x 1, 1x RJ 45 LAN Gigabit Ethernet, 4 x PCI Warranty: min. 36 months Other: Keyboard, mouse, power cords; Monitor (from the same manufacturer as the computer): Diagonal min 21.5 ", Resolution min 1920x1080, VGA / DP / HDMI,</p>	10	459	4.590,00
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			Integrated speakers; Other: monitor cables;			
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University of East Sarajevo	Preparation	P5	<p>LAPTOP 15.6 with the following minimum characteristics:</p> <p>PROCESSOR: Number of cores: min 4; Number of threads: 4; Frequency: min 1.1 GHz; Maximum frequency: min 2.7 GHz; L3 cache memory: min 4 MB;</p> <p>RAM: Type: min DDR4; Speed: min 2400 MHz; Capacity: min 4 GB;</p> <p>SOLID STATE DRIVE: Capacity: min 128 GB; Form: M.2;</p> <p>SCREEN: Size: 15.6 "; Resolution: min 1920 × 1080;</p> <p>GRAPHICS CARD: Integrated;</p> <p>PORTS: HDMI: minimum 1; USB 3.1: minimum 2; USB 2.0: minimum 1; LAN: minimum 1; Audio-Combo: min 1;</p> <p>OTHER: Integrated Wi Fi: Yes; Integrated Stereo Speakers: Yes; Integrated camera: Yes;</p> <p>Warranty: min 24 months</p>	13	306	3.978,00
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University of East Sarajevo	Preparation	P5	<p>LAPTOP 15.6 with the following minimum characteristics:</p> <p>PROCESSOR: Number of cores: min 4; Number of threads: min 8; Cache memory: min 6 MB; PassMark: min. 7900</p> <p>RAM: type min DDR4; Speed: min 2666 MHz; Capacity: min 8 GB;</p> <p>SOLID STATE DRIVE: Capacity: min 512 GB;</p> <p>SCREEN: min 15.6 "; Resolution min 1920 x 1080px;</p> <p>Graphics card: 2 GB GDDR5 dedicated</p> <p>PORTS: HDMI min 1; USB min 2; LAN min 1; Audio-Combo min 1;</p> <p>OTHER: Integrated WiFi: Yes;</p> <p>Battery: 3-cell, 41 Wh Li-ion;</p> <p>Integrated stereo speakers: Yes;</p> <p>Integrated Bluetooth: Yes;</p> <p>Integrated camera: Yes;</p> <p>Warranty: min. 12 months</p>	5	663	3.315,00
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University of East Sarajevo	Preparation	<p>LAPTOP 17.3 with the following minimum characteristics:</p> <p>PROCESSOR: Number of cores: min 4; Number of threads: 8; Frequency: min 1.8 GHz; Maximum frequency: min 4.9 GHz; Cache memory: min 8 MB;</p> <p>RAM: Type: min DDR4, Speed: min 2666 MHz, Capacity: min 16 GB;</p> <p>SOLID STATE DRIVE: Capacity: min 256 GB; Interface: PCIe NVMe; Form: M.2;</p> <p>HDD: 1TB 5400 RMP</p> <p>SCREEN: Size: 17.3 "; Resolution: min 1920 x 1080px;</p> <p>GRAPHICS CARD: Memory min 2 GB GDDR5;</p> <p>PORTS: HDMI: minimum 1, USB 3.1: minimum 2, USB 2.0: minimum 1, LAN: minimum 1; Audio-Combo: min 1;</p> <p>OTHER: Integrated Wi Fi: Yes; Stereo speakers integrated: Yes; Integrated Bluetooth: Yes; Integrated Camera: Yes; Optical drive: DVD-RW;</p> <p>Warranty: min. 24 months</p>	3	867	2.601,00
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University of East Sarajevo	Preparation	P5	<p>SMART TV with the following minimum features:</p> <p>Screen: min 55 ", Resolution min 4K; Smart: Yes; Connectors: Lan, WiFi; Warranty: min 60 months; possibility of wall mounting</p>	2	255	510,00
University of East Sarajevo	Preparation	P5	<p>TV BRACKET</p> <p>Load capacity 50 kg; Minimum screen diagonal 30 "; Maximum screen diagonal 60"; Variability: telescopic; Downward slope 20; Rotation +/- 60 °; Level correction +/- 3 °; Minimum distance from the wall 6 cm; Maximum distance from the wall 47.3 cm;</p>	5	40,8	204,00

University of East Sarajevo	Preparation	P5	<p>FOTO APARAT sljedećih minimalnih karakteristika:</p> <p>SLIKA: Camera Format DX / (1.5x Crop Factor); Pixels Actual: 24.78 Megapixel; Effective: 24.2 Megapixel; Max Resolution 24 MP: 6000 x 4000; Aspect Ratio 3:02; Sensor Type / Size CMOS, 23.5 x 15.6 mm; File Formats: Still Images: JPEG, RAW; Movies: MOV, MPEG-4 AVC/H.264; Audio: Linear PCM (Stereo); Bit Depth: 14-Bit; Dust Reduction System: Yes; Memory Card Type: SD SDHC SDXC;</p> <p>KONTROLA FOKUSA: Focus Type: Auto & Manual; Focus Mode: Automatic (A), Continuous-Servo AF (C), Manual Focus (M), Single-servo AF (S); Autofocus Points: Phase Detection: 39 (9 Cross-Type);</p> <p>VIEWFINDER/DISPLAY: Viewfinder Type: Pentamirror; Viewfinder Eye Point: 17.00 mm; Viewfinder Coverage: 95%; Viewfinder Magnification: APHOTO CAMERA with the following minimum characteristics:</p> <p>PICTURE: Camera Format DX / (1.5x Crop Factor); Pixels Actual: 24.78 Megapixels; Effective: 24.2</p>	1	546	546,00
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			<p>Megapixel; Max Resolution 24 MP: 6000 x 4000; Aspect Ratio 3:02; Sensor Type / Size CMOS, 23.5 x 15.6 mm; File Formats: Still Images: JPEG, RAW; Movies: MOV, MPEG-4 AVC / H.264; Audio: Linear PCM (Stereo); Bit Depth: 14-Bit; Dust Reduction System: Yes; Memory Card Type: SD SDHC SDXC;</p> <p>FOCUS CONTROL: Focus Type: Auto & Manual; Focus Mode: Automatic (A), Continuous-Servo AF (C), Manual Focus (M), Single-servo AF (S); Autofocus Points: Phase Detection: 39 (9 Cross-Type);</p> <p>VIEWFINDER / DISPLAY: Viewfinder Type: Pentamirror; Viewfinder Eye Point: 17.00 mm; Viewfinder Coverage: 95%; Viewfinder Magnification: Approx. 0.82x; Diopter Adjustment: -1.7 to +0.5 m; Display Screen: 3.2 "Rear Touchscreen Swivel LCD (1,037,000); Screen Coverage: 100%; Diagonal Angle of View: 170.0 °;</p> <p>EXPOSURE CONTROL: ISO Sensitivity: Auto, 100-25600; Shutter: 30 - 1/4000 Second, Bulb Mode; Remote Control WR-1, WR-10, MC-DC2 (Optional); Metering Method: Center-Weighted Average</p>		
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			<p>Metering, Matrix, Spot Metering; Exposure Modes: Modes: Aperture Priority, Manual, Program, Scene Modes, Shutter Priority; Metering Range: EV 0.0 - EV 20.0; Compensation: -5 EV to +5 EV (in 1/3 or 1/2 EV Steps); Buffer / Continuous Shooting Up to 5 fps at 24.2 MP, Up to 4 fps at 24.2 MP, Up to 3 fps at 24.2 MP; White Balance Modes: Auto, Cloudy, Direct Sunlight, Flash, Fluorescent, Incandescent, Preset Manual, Shade; FLASH: Flash Modes: Auto; Auto / Red-Eye Reduction, Fill-In, Rear Curtain Sync / Red-Eye Reduction, Rear Curtain / Slow Sync, Red-Eye Reduction, Slow Sync, Slow Sync / Red-Eye Reduction; Built-in Flash: Yes; Guide No. 39.37'; (12 m) ISO100; Max Sync Speed: 1/200 Second; Flash Compensation: -3 EV to +1 EV (in 1/3 or 1/2 EV steps); Dedicated Flash System: iTTL; External Flash Connection: Hot Shoe; AV RECORDING: Video Recording: Yes, NTSC / PAL; Video Format: 1920 x 1080p at 23.98, 25, 29.97, 50, 59.94 fps (MOV), 1280 x 720p at 50, 59.94 fps (MOV); Aspect Ratio: 16:09; ISO Sensitivity: 100 - 25600;</p>		
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			<p>Focus: Auto, Manual; Continuous Auto; Max Video Clip Length: 1920 x 1080: 29 Minutes, 59 Seconds; Audio Recording: Built-In Mic: With Video (Stereo), Optional External Mic: With Video (Stereo); PERFORMANCE: Self Timer: 20 Seconds, 10 Seconds, 5 Seconds, 2 Seconds; Interval Recording: Yes; Connectivity: HDMI C (Mini), Micro-USB, USB 2.0; Wi-Fi Capable: Yes; POWER: Battery: 1 x EN-EL14a Rechargeable Lithium-Ion Battery Pack, 7.2 VDC, 1230 mAh; AC Power Adapter: EH-5b (Optional); Operating / Storage Temperature: Operating, 32 to 104 ° F (0 to 40 ° C), Humidity: 0 - 85%; PHYSICAL: Dimensions (W x H x D): 4.9 x 3.8 x 2.8 "/ 124.0 x 97.0 x 70.0 mm; Weight: 1,023 lbs / 465 g;</p> <p>KIT LENS: Focal Length: 18 - 55mm, Comparable 35mm Focal Length: 27 - 82.5 mm; Aperture: Maximum: f / 3.5 - 5.6, Minimum: f / 22 - 38; Angle of View: 76 ° - 28 ° 50 '; Minimum Focus Distance: 9.84 "(25 cm); Magnification: 0.38x; Elements / Groups: 14/10; Diaphragm Blades: 7, Rounded; Autofocus: Yes; Image Stabilization: Yes; Filter Thread: Front: 55 mm;</p>		
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			<p>Dimensions (DxL): Approx. 2.54 x 2.46 "(64.5 x 62.5 mm); Weight: 7.23 oz (205 g); approx. 0.82x; Diopter Adjustment: -1.7 to +0.5 m; Display Screen: 3.2" Rear Touchscreen Swivel LCD (1,037,000); Screen Coverage: 100%; Diagonal Angle of View: 170.0°;</p> <p>EXPOSURE CONTROL: ISO Sensitivity: Auto, 100-25600; Shutter: 30 - 1/4000 Second, Bulb Mode; Remote Control WR-1, WR-10, MC-DC2 (Optional); Metering Method: Center-Weighted Average Metering, Matrix, Spot Metering; Exposure Modes: Modes: Aperture Priority, Manual, Program, Scene Modes, Shutter Priority; Metering Range: EV 0.0 - EV 20.0; Compensation: -5 EV to +5 EV (in 1/3 or 1/2 EV Steps); Buffer/Continuous Shooting Up to 5 fps at 24.2 MP, Up to 4 fps at 24.2 MP, Up to 3 fps at 24.2 MP; White Balance Modes: Auto, Cloudy, Direct Sunlight, Flash, Fluorescent, Incandescent, Preset Manual, Shade; FLASH: Flash Modes: Auto; Auto/Red-Eye Reduction, Fill-In, Rear Curtain Sync/Red-Eye Reduction, Rear Curtain/Slow Sync, Red-Eye</p>		
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			<p>Reduction, Slow Sync, Slow Sync/Red-Eye Reduction; Built-in Flash: Yes; Guide No. 39.37'; (12 m) ISO100; Max Sync Speed: 1 / 200 Second; Flash Compensation: -3 EV to +1 EV (in 1/3 or 1/2 EV steps); Dedicated Flash System: iTTL; External Flash Connection: Hot Shoe; AV RECORDING: Video Recording: Yes, NTSC/PAL; Video Format: 1920 x 1080p at 23.98, 25, 29.97, 50, 59.94 fps (MOV), 1280 x 720p at 50, 59.94 fps (MOV); Aspect Ratio: 16:09; ISO Sensitivity: 100 - 25600; Focus: Auto, Manual; Continuous Auto; Max Video Clip Length: 1920 x 1080: 29 Minutes, 59 Seconds; Audio Recording: Built-In Mic: With Video (Stereo), Optional External Mic: With Video (Stereo); PERFORMANCE: Self Timer: 20 Seconds, 10 Seconds, 5 Seconds, 2 Seconds; Interval Recording: Yes; Connectivity: HDMI C (Mini), Micro-USB, USB 2.0; Wi-Fi Capable: Yes; POWER: Battery: 1 x EN-EL14a Rechargeable Lithium-Ion Battery Pack, 7.2 VDC, 1230 mAh; AC Power Adapter: EH-5b (Optional); Operating/Storage Temperature: Operating, 32 to 104°F (0 to 40°C), Humidity: 0 - 85%; PHYSICAL:</p>		
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			<p>Dimensions (W x H x D): 4.9 x 3.8 x 2.8" / 124.0 x 97.0 x 70.0 mm; Weight: 1.023 lbs / 465 g;</p> <p>KIT LENS: Focal Length: 18 - 55mm, Comparable 35mm Focal Length: 27 - 82.5 mm; Aperture: Maximum: f/3.5 - 5.6, Minimum: f/22 - 38; Angle of View: 76° - 28° 50'; Minimum Focus Distance: 9.84" (25 cm); Magnification: 0.38x; Elements/Groups: 14/10; Diaphragm Blades: 7, Rounded; Autofocus: Yes; Image Stabilization: Yes; Filter Thread: Front: 55 mm; Dimensions (DxL): Approx. 2.54 x 2.46" (64.5 x 62.5 mm); Weight: 7.23 oz (205 g);</p>			
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University of East Sarajevo	Preparation	P5	<p>LIGHTING with the following minimum characteristics:</p> <p>CMOS chip technology; Integrated radio receivers in heads; 3 x VC-600HH PLUS flash head; 3 x LS-8008 Tripod (292 cm); 1 x Softbox 80x 100cm; 2 x Black / white umbrella 85cm; 1 x Quality larger three-head bag KB-B; Warranty: 36 months</p>	1	890	890,00
University of East Sarajevo	Preparation		<p>TRIPOD with the following minimum characteristics:</p> <p>GENERAL: Load capacity: min. 8.8 lbs (4 ()); Maximum width: 74.8 "(190cm); Maximum height w / o Column Extended: 58.6 "(148.8cm); Minimum Height: 7.3 "(18.5cm); Folded Length: 32.3" (82cm); Leveling Bubble / Illuminated: No; Weight: 7.4 lbs (3.3kg); HEAD: Counter Balance System: None; Quick Release / Wedge Plate: Yes (200PL-14); Balance Plate: Fixed, with 1/4 "-20 screw; Tilt Drag: None; Tilt Range: - 60 / + 90 °; Tilt Lock: Yes; Spring Loaded Counter Balance: None; Pan Range: 360 °; Pan Lock: Yes; LEGS: Material: Aluminum; Head</p>	1	190	190,00

			Attachment Fitting: 3/8 "; Leg Stages / Sections: 2/3; Leg Lock Type: Flip Levers; Independent Leg Spread: Yes; Spiked / Retractable Feet: Optional; Center Brace: None			
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University of East Sarajevo	Preparation	P5	<p>WIRELESS ROUTER with the following minimum characteristics:</p> <p>Architecture: 32bit; CPU: CPU core count: 4; CPU nominal frequency: min. 716 MHz; Dimensions: max. 100 x 235 x 97 mm; License level: 4; RAM: min. 256 MB; Warehouse: min. 128 MB; Warehouse type: NAND Tested ambient temperature: -40 ° C to 60 ° C; Power supply: PoE and: Passive PoE; PoE and input voltage: 24-57 V; Number of DC inputs: 2 (DC jack, PoE-IN); DC jack input Voltage: 12-57 V; Max power consumption: 27 W; Max power consumption without attachments: 27 W;</p> <p>Wireless 2.4 GHz Max data rate: 300 Mbit / s; Wireless 2.4 GHz number of chains: 2; Wireless 2.4 GHz standards: 802.11b / g / n; Antenna gain dBi for 2.4 GHz: 3.5; Wireless 2.4 GHz generation: Wi-Fi 4;</p> <p>Wireless 5 GHz Max data rate: 867 Mbit / s</p>	5	153	765,00
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			<p>Wireless 5 GHz number of chains: 2 Wireless 5 GHz standards: 802.11a / n / ac Antenna gain dBi for 5 GHz: 4.5 Wireless 5 GHz generation Wi-Fi 5</p> <p>Wireless 5 GHz Max data rate: 1733 Mbit / s Wireless 5 GHz number of chains: 4 Wireless 5 GHz standards: 802.11a / n / ac Antenna gain dBi for 5 GHz: 4.5 Wireless 5 GHz generation: Wi-Fi 5</p>			
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University of East Sarajevo	Preparation	P5	<p>PRINTER laser black and white A4 with the following minimum characteristics:</p> <p>Display: LCD display Print speed min. : 40 pages per minute A4; First page out time: up to 6.4 sec Monthly print capacity: min. 50,000 pages Resolution: min. 1200 dpi; Dimensions (W x D x H) of the main unit: max. 376 x 395 x 275 mm; Warranty: 1 year + additional warranty on long-life parts 3 years or 100,000 pages; Print language: PCL 5e, PCL 6, postscript level 3 emulation Connectivity: Gigabit Ethernet (10BaseT / 100BaseTX / 1000BaseT); USB 2.0 (Hi-speed) Automatic double-sided printing: Duplex Warm-up time: max. 15 seconds from ignition; Power supply - consumption max. : printing code: 620 W; Ready mode: 8 W, Sleep mode: 0.8 W; Processor: min. 800MHz; Input capacity min .: 350 expandable to 850 sheets; Output capacity: 250 sheets;</p>	4	178,5	714,00
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			Drum - Photoconductor: 100,000 pages minimum print (one or more up to specified capacity)			
University of East Sarajevo	Preparation	P5	SSD DISK with the following minimum characteristics: Solid state drive: min 120GB, 2.5"; Compatible for HP ProBook 4530s;	15	25,5	390,00
University of East Sarajevo	Preparation	P5	PROJECTION SCREEN + STAND 200cm X 200cm, stand included	1	76,5	76,50

University of East Sarajevo	Preparation	P5	<p>8GB DDR4 SDRAM MEMORY MODULE</p> <p>Compatible with HP Proliant ML110 Gen9; Capacity: 8GB; Memory technology: DDR4 SDRAM; Bus speed: 2400MHZ DDR4-2400 / PC4-19200; Data integrity check: ECC; Signal processing: registered; Cas latency timings: CL17; Features: 1RX8</p>	6	153	918,00
University of East Sarajevo	Preparation	P5	<p>Speaker Set 2.1 with Bluetooth with the following minimum characteristics:</p> <p>Speaker type: 2.1; Max. total weight: 4900 g; Connection type: wired, wireless; Audio input: Bluetooth, 3.5 mm, Line-in; Audio output: 3.5 mm; Power supply (RMS): 120 W; Power cords included; Speaker cables included;</p>	1	76,5	76,50

University of East Sarajevo	Preparation	P5	<p>SERVER (RACK 2U) with the following minimum characteristics:</p> <p>PROCESSOR: Number of cores: min 8; Number of threads: 16; Up to 3.20 GHz; Cache memory: min 11 MB;</p> <p>RAM: 16GB DDR4 2933 MT / s (PC4-23400) CL21 DR x8 ECC Registered DIMM 288pin;</p> <p>SSD: 2.5" 7mm, SATA 6 Gb / s, Read / Write: 540/520 MB / s, Random Read / Write IOPS 95K / 35K;</p> <p>HDD: 3.5 ' / 4TB / SATA 6GB / s / 7200rpm</p> <p>RAID Storage Controller: min. 2GB NV cache memory;</p> <p>Operating System & Software: None;</p> <p>Min. 12x 3.5-inch forward drive slots</p> <p>Min. 2x 3.5-inch back disc slots</p> <p>Network: 4x GbE RJ-45, 1x Management interface;</p> <p>Ports: Forward: 1 x Dedicated iDRAC Direct USB, 1 x USB 2.0, 1 x Video; Back: 1 x Dedicated iDRAC network port, 1 x Serial, 2 x USB 3.0, 1 x Video</p> <p>Redundant power supply min: 2 x 750W; Power cords included</p> <p>Warranty: 36 months</p>	1	3500	3.500,00
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University of East Sarajevo	Preparation	P5	<p>Laptop: 15.6 with the following minimum features:</p> <p>Screen: 15.6" FHD IPS anti-glare (1920 x 1080) 144Hz Processor: Number of cores: min 8; Number of threads: min 16; Frequency: min 2.90 GHz; Maximum frequency: min 4.20 GHz; PassMark min: 19000 RAM: 16GB DDR4 (2666Mhz); HDD: 512 GB PCIe® NVMe™ M.2 SSD Graphics card: 4GB GDDR6; Ports: HDMI, USB 3.2 x2, USB 2.0 x2, USB 3.2 Type-C x1, LAN, Audio-Combo, LAN / Bluetooth 5.0 / WiFi; Warranty: 24 months</p>	2	1300	2.600,00
University of East Sarajevo	Preparation	P5	<p>Desktop computer with the following minimum characteristics:</p> <p>Processor: Number of cores: min 2; Number of threads: min 4; Frequency: min 3.80 GHz; Cache: 4MB Graphics card: Integrated, Ram: 4 GB DDR4, SSD: 120 GB, Housing and power supply: Tower 500W Other: LAN: Gigabit, AUDIO: HD 2.1, VGA, HDMI, 4x USB 3.1, 6x USB 2.0, 1xM.2 Socket 3 2242/2260/2280,</p>	14	400	5.600,00

			<p>2x PS2, 1x DVI-D, keyboard + optical mouse</p> <p>Keyboard + USB optical mouse;</p> <p>Monitor 19.5 ": Wide format: 16: 9, Brightness: 250cd / m2, Color: 16.7 million, Response time: 5 ms, input: VGA / DP / DVI / HDMI</p>			
University of East Sarajevo	Preparation	P5	<p>Speakers 2.1 with the following minimum characteristics:</p> <p>Two satellite speakers + subwoofer; Total watts (RMS): min. 7 W, subwoofer: 4 W, satellites: 2 x 1,5 W, 3,5 mm input: 1, headphone jack: 1</p>	8	30	240,00

University of East Sarajevo	Preparation	P5	<p>WebCam 4K with the following minimum characteristics:</p> <p>WebCam 4K UHD: 4K Ultra HD video calls (up to 4096 x 2160 pixels @ 30 fps)</p> <p>Full HD video calls from 1080p (up to 1920 x 1080 pixels at 30 or 60 fps)</p> <p>720p HD video calls (up to 1280 x 720 pixels at 30, 60 or 90 fps)</p> <p>Plug-and-play USB connection</p> <p>Field of view: Diagonal: 90 ° Horizontal: 82.1 ° Vertical: 52.2 °</p> <p>5x digital zoom in Full HD resolution</p> <p>Autofocus</p> <p>Rightlight™ 3 with HDR for a clear image in a variety of lighting environments ranging from low light to direct sunlight.</p> <p>Picture controls with the optional Camera Settings app to control pan, tilt and zoom</p> <p>Built-in dual omni-directional noise-canceling microphones</p> <p>Infrared sensor technology for Windows (SDK available for application integration)</p> <p>External privacy shutter</p> <p>More mounting options, including a clip and a tripod bracket</p>	8	250	2.000,00
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			It supports multiple connection types, including USB 2.0 Type A and USB 3.0 Type A and C connections			
University of East Sarajevo	Preparation	P5	Smart board Diagonal whiteboard size 77 “or 195.6cm; 4: 3 Aspect ratio; Writing possible with pencil and finger; Integrated two DVIT cameras; Minimum resolution 32,000 x 32,000; CE, ROHS and WEEE certificates; Warranty min 2 years. A complete version of the software	5	1200	6.000,00

			<p>application on CD or DVD is included. The software must be available online for download. Support for Windows and Linux operating system. Integrated service for automatic recognition of updates and alerting users about it. Additional content and lessons must be available online and allow you to search by subject and subcategory.</p>			
University of East Sarajevo	Preparation	P5	<p>Projector with wall mount</p> <p>DLP technology; Short throw; XGA resolution 1024 x 768, Contrast min 10,000: 1; Illumination min 3300 ANSI lumens; Lamp 270W; Lamp duration min 5500 h in standard mode; Lens F = 2.4, f = 6.5 mm; Projection angle min 40.7 - 40.9 °; Projection factor 0.56: 1; Distance max 0.68 - 1.76m; Image diagonal min / max 152.4-381 cm; Digital Zoom; Interface VGA, 2xHDMI, RS-232, RJ45, USB Type A & Type B, Optional wireless; integrated speakers min 20W; Warranty minimum 24 months on projector, 6 months or 1000 hours on lamp.</p> <p>Note:</p> <ul style="list-style-type: none"> • The whiteboard and software must be from the same manufacturer. 	5	1000	5.000,00

			<ul style="list-style-type: none"> The price includes a 10m long HDMI cable, installation and calibration of equipment, registration with the manufacturer 			
University of East Sarajevo	Preparation	P5	<p>ELECTRICAL OUTLET with the following minimum characteristics:</p> <p>Number of schuko sockets: minimum 6, Length: minimum 3 meters, Warranty: minimum 24 months.</p>	5	28,05	149,03

University of East Sarajevo	Preparation	P5	<p>AiO computer with the following minimum characteristics:</p> <p>OS: Windows 10 Pro Display: min 21.5" Screen: 1920 x 1080 touche PROCESSOR: Number of cores: min 2; Number of threads: min 4; Frequency: min 2.6 GHz; Maximum frequency: min 3.50 GHz; Cache memory: min 4 MB; RAM: min 8 GB DDR4-2400 SDRAM (1 x 8 GB) SSD: min 256 GB PCIe® NVMe™ M.2 SSD Graphics and sound: integrated Ports: min 2 x USB 3.0 Min 2 x USB 2.0 Min 1 x HDMI Optics: DVD / RW Tattoo + mouse Network: LAN, WiFi Warranty: min 24 months</p>	5	650	3.250,00
					Total (UES)	57.000,00 €
Univerity of Mostar	Preparation	P7	ThinClient equivalent to HP T430/SZ TC	60	232,64	13960,00
Univerity of Mostar	Preparation	P7	Monitor equivalent to HP P24h G4 FHD	30	171,92	5160,00
Univerity of Mostar	Preparation	P7	SWITCH equivalent to Cisco SG220-26P 26-Port Gigabit PoE Smart Switch	2	649,47	1300,00

Univerity of Mostar	Preparation	P7	Projector equivalent to Epson EB-S05	3	357,90	1100,00	
Univerity of Mostar	Preparation	P7	Projector lamp equivalent to EPSON S05	1	70,30	75,00	
Univerity of Mostar	Preparation	P7	SSD disc equivalent to SAMSUNG SSD 860 EVO 1TB;2.5in SATA3 MZ-76E1T0B/EU	12	230,08	2770,00	
Univerity of Mostar	Preparation	P7	Storage disc equivalent to LEN 1.2TB 10K 6Gbps SAS 2.5" HDD	4	455,69	1825,00	
Univerity of Mostar	Preparation	P7	Server equivalent to ThinkSystem SR650	1	22246,31	22250,00	
Univerity of Mostar	Preparation	P7	Mini PC equivalent to HP 260G3 DM P4415 4GB/500 PC	5	339,37	1700,00	
Univerity of Mostar	Preparation	P7	Computer equivalent to COM LC Core i5 710 SSD 9400F,B365,16GB	6	666,42	4000,00	
Univerity of Mostar	Preparation	P7	Laptop equivalent to HP ProBook 650 G5	3	949,72	2860,00	
						Total (SUM)	57.000,00 €