Standard Form Number : **SF-GOODS-30**

SUPPLEMENTAL / BID BULLETIN (SBB)
ADDENDUM NO. 01

This SBB Addendum No. **01** dated May 8, 2020 for the Project: **Purchase of Computer Engineering Laboratory Equipment** is issued to clarify, modify or amend items in the Bidding Documents. Accordingly, this shall form an integral part of said Documents.

PARTICULARS	CLARIFICATION / AMENDMENT
Based on the Discussion during the Pre-bid Conference and upon confirmation by the Technical Working Group and the End-User Unit conducted on May 7, 2020 @ 10:00am for this Project, the following are the revisions: **1.** On last sentence of Paragraph 1 of the Invitation to Bid under Section I, page 4 of the bid document, below are the revisions: *…Bids received in excess of the ABC ~~for each lot~~ shall be automatically rejected at bid opening.*	
2. On Paragraph 2 of the Invitation to Bid under Section I, page 4 of the bid document, below are the revisions on ABC:	

Item No.	Particulars	Approved Budget for the Contract	Bidding Fees (Non-Refundable)	Delivery Period
	Purchase of Computer Engineering Laboratory Equipment (1 lot)	**₱10,000,000.00**	**₱10,000.00**	**~~45~~ 150 calendar days**
~~1~~	~~Training Robot Basic Set Equipment~~	~~2,500,000.00~~		
~~2~~	~~Fundamentals of Robot Technology using Uni-Train~~	~~2,500,000.00~~		
~~3~~	~~Robot Technology for Mechatronics Applications~~	~~2,500,000.00~~		
~~4~~	~~Compact Automation~~	~~2,500,000.00~~		
~~Total~~				

Delivery of the Goods is required within ~~Forty-Five (45)~~ One Hundred Fifty (150) calendar days for all items, upon receipt of the Notice to Proceed and/or Purchase Order in accordance with the Delivery Schedule under Section VI. Schedule of Requirements. Bidders should have completed, within Three (3) years from the date of submission and receipt of bids, a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II. Instructions to Bidders.

For deposit on payment of the bid documents, please contact the BAC Secretariat to forward the KSU LBP account number:

Mr. Ronaldo B. Daluping
(074) 627 5321 / procurementservice_bac@ksu.edu.ph / 0917-774-4185

3. On Paragraph 7(2) of the Invitation to Bid under Section I, page 5 of the bid document, below are the revisions on venue and new Zoom account:

…Bid opening shall be at 10:01 AM on May 19, 2020 at the ~~VPAF Office, Admin Bldg.,~~ **Alumni Center**, KSU-Main Campus, National Highway, Purok 6, Bulanao, Tabuk City, Kalinga. Bids will be opened through Zoom Video-Conferencing (ID: ~~623-224-9110~~ **540 049 6853** and Password: ~~ksu101~~ **ksu202**). Bid Documents must be mailed by prospective bidders through courier. Late bids shall not be accepted.

4. On ITB Clause 1.2 of the Bid Data Sheet under Section III, page 28 of the bid document, below are the revisions on ABC:

The lots and reference are:

Purchase of Computer Engineering Laboratory Equipment, categorized as follows:

Item No.	Particulars	Approved Budget for the Contract
1 lot	**Purchase of Computer Engineering Laboratory Equipment (1 lot)**	₱10,000,000.00
~~1~~	~~Training Robot Basic Set Equipment~~	~~2,500,000.00~~
~~2~~	~~Fundamentals of Robot Technology using UniTrain~~	~~2,500,000.00~~
~~3~~	~~Robot Technology for Mechatronics Applications~~	~~2,500,000.00~~
~~4~~	~~Compact Automation~~	~~2,500,000.00~~
	~~Total ABC~~	

5. On ITB Clause 24.1 of the Bid Data Sheet under Section III, page 31 of the bid document, below are the revisions on venue of Bid Opening:

~~VPAF Office, Admin Bldg.~~ Alumni Center
Kalinga State University – Main Campus
National Highway, Purok 6, Bulanao, Tabuk City, Kalinga
…

6. On Schedule of Requirements under Section VI, pages 48-49 of the bid document, below is the revised Schedule of Requirements:

Item No.	Item and Description	Qty	Unit	Delivered, Weeks/Months
	Purchase of Computer Engineering Laboratory Equipment	1	lot	*Contract Warranty:* Three (3) Years upon the issuance of Certificate of Completion (Specifically include goods and services) *Delivery Period:* One Hundred Fifty (150) Calendar Days upon acceptance of the Notice or order. Delivery and Installation service shall be completed within Seven (7) calendar days upon Acceptance of the Notice to Proceed or Purchase Order. *To be delivered at:* Computer Engineering Laboratory Room, Kalinga State University, Main Campus, National Highway, Purok 6, Bulanao, Tabuk City, Kalinga, Philippines

7. On Technical Specifications under Section VII, pages 50 onwards of the bid document, below are the revisions based on the End-user's approved Proposal:

Technical Specifications

Item	Specification	Statement of Compliance *Bidders must state here either "Comply" or "Not Comply" against each of the individual parameters of each Specification stating the corresponding performance parameter of the equipment offered. Statements of "Comply" or "Not Comply" must be supported by evidence in a Bidders Bid and*

		cross-referenced to that evidence. ***Evidence shall be in the form of manufacturer's un-amended sales literature, unconditional statements of specification and compliance issued by the manufacturer, samples, independent test data etc., as appropriate.*** *A statement that is not supported by evidence or is subsequently found to be contradicted by the evidence presented will render the Bid under evaluation liable for rejection. A statement either in the Bidders statement of compliance or the supporting evidence that is found to be false either during Bid evaluation, post-qualification or the execution of the Contract may be regarded as fraudulent and render the Bidder or supplier liable for prosecution subject to the provisions of* ***ITB*** *Clause 3.1 (a)(ii) and/or* ***GCC*** *Clause 2.1(a)(ii)*	
		Comply	Not Comply
	PURCHASE OF COMPUTER ENGINEERING LABORATORY EQUIPMENT (1 LOT)		
1	Training Robot Basic Set Equipment		
	Composition:		
	a.) Handling Robot, 4 Axis, 500 g (1 unit)		
	robot arm: • *Payload:* 500 g • *Maximum range:* 550 mm including gripper hand • Electrically operated parallel grippers • *Ports:* 9-pin I/O with 3 DI/4 DO, CAN programming interface • *Positioning accuracy:* 1 mm • *Supply:* 12 V via wide-range power supply 100 V - 240 V, 47 Hz - 63 Hz • A PC is required to control operations 3D programming software CPRog controller software uses a modern user interface and interactive 3D graphics to provide a direct introduction to programming movements for a robot arm. The robot can be moved via keys or by means of a joy-pad. Programmes can be created or edited using a graphic editor. The licence allows for installation of a set for a whole classroom. Alternatively, the robot can be operated using ROS (Robot Operating System made by Willow Garage) and appropriate packages are available for this. • Parallel operation and programming (3D model and authentic robot arm) • Stand-alone programming (3D model only) • Control, programming, simulation Inclusion: • robot arm, heavy-duty modified version • Power supply, 12 V / 5 A • USB/CAN adapter • Stand base • Electrically operated parallel grippers		

	• Joy-pad • Transport box • 3D programming software		
	b.) Mounting plate for training robot (1 unit)		
	Fast-connect attachment plate: Attachment plate on rubber feet to provide a firm base for a training robot. The plate also constitutes a project platform for combining mechatronics systems with the robot. The storage spaces and plug-in connections for mechatronics systems ensure that components are kept at a fixed, well-defined distance from one another. The equipment can be quickly set up so that you can adapt the lessons to match your requirements. If the robot is to be connected to a production line with a 180° curve, the attached conveyor belt can be removed in seconds. Benefits: • Project platform • Rapid set-up thanks to quick-release connections • Four storage positions for work pieces • Multiple connection options for various projects		
	c.) Interactive Lab Assistant: Setting up training robots (1 unit)		

	browser and course software.
	Contents:
	• Hardware set-up
	  ○ Robot arm
	  ○ Project selection
	• Communication settings
	• Software user interface
	• Changes in the 3D environment
	• Control and movement
	  ○ Control via software
	  ○ Control via joypad
	  ○ Types of movement
	• Robot settings
	• Obtaining axis correction data
	• Programming interfaces
	  ○ Graph editor
	  ○ Text editor
	• Project work
	  ○ Workpiece change-over project
	  ○ Transport to production-line project
	  ○ Workpiece sorting project
	  ○ PLC connection project
	  ○ Project for connecting conveyor to PLC system
	• Course duration: approx. 8 h		

	d.) Workpiece, top section, black (1 unit)		
	• *Material:* plastic • *Colour:* black • Magnetic clip for attachment to bottom section • Spring-loaded bearing for attaching bolt • *Dimensions (LxWxH):* (100 x 50 x 40) mm / 3,9" x 1,97" x 1,57"		
	e.) Workpiece, bottom section, white (1 unit)		
	• *Material:* plastic • *Colour:* white • Magnetic clip for attachment to top section • *Dimensions (LxWxH):* (100x50x40) mm / 3,9" x 1,97" x 1,57"		

2	**Fundamentals of Robot Technology**		
	Composition:		
	a.) Course automation technology 3: Basics robot technology (1 unit)		
	Includes: • 1 Experiment card containing CPU with PLC functionality and PROFIBUS-DP master interface, 8 digital inputs with simulation switches and status LED, 8 digital outputs with status LED connected via 2 mm socket, 8 analog inputs with 10-bit resolution, 4 analog outputs, potentiometer for simulating analog inputs, selectable levels for digital signals 5 / 24 V DC, level for analog signals 0-10 V, external PROFIBUS devices may also be connected • 1 Experiment card with direct connection from SUB-D9/SUB-D25 to 2 mm sockets • Browser und Course-Software Additionally required for course: • 4 axis handling robot • Conveyor belt 24 V Course contents: • Introduction - Safety instructions, structure of robot • Programming of movements - Movement types, Coordinate systems, Joint movement, Linear movement, Speed and acceleration, Tool coordinate system • Programming of IO instructions - Possibilities of communication, Implementation, Gripper: Variants and controls, linkage with conveyor belt • Programming of structures - Wait, If-then-else, For, subroutines, Test of programs • Programming of tasks - Proceed, Strategies, Planning, Programming of movements, PLC-Programming		
	b.) Double conveyor belt segment, 24 V motor (1 unit)		
	• *Length* = 600 mm/23,6", *width* = 160 mm/6,3", • *belt width* = 120 mm/4,7" • *Geared motor,* 24 V DC • Pulse width modulation system for controlling belt at various speeds • Continuous speed adjustment via potentiometer or analogue input, 0-10 V • Manual switches for movement to left or right • 2 inductive end-limit sensors • 2 x M12 interfaces for additional actuators/sensors • Sockets for emergency shut-off circuit (disconnection of all voltage to output modules) • External power supply via 4-mm safety sockets or co-axial power connector • 9-pin SUB-D connector for contactors, LOGO! or PLC • Incremental encoder disc for detecting position and speed via optical sensors • Visualisation as interactive 3D model in IMS-virtual database • Control requirements: 4 x digital inputs, 3 x digital outputs PROFIBUS DP slave module: • Address range: 16 digital input/outputs • PROFIBUS DP connector: 9-pin DSUB socket • Rotary switch for setting address		

	• Transmission rates of up to 6 Mbits/s • GSD file for use with control software (e.g.: STEP7) • 25-pin DSUB socket for connecting IMS station • Output current: 500 mA (total current: 1 A) • Variable speed control of conveyor belt via PROFIBUS		
	c.) Workpiece transport pallet (1 unit)		
	Pallets for carrying and transporting workpieces on conveyor belts. The pallet as a 4-bit identification code. • Length = 180 mm/7,1", width = 119 mm/4,7", • height = 15 mm/0,6" • Position sensor • 4-bit identification code		
	d.) interface with virtual instruments (1 unit)		
	Equipment: • 32-bit processor with storage memory for measurements • USB interfaces, transfer rate 12 Mbits/s • WLAN/WiFi interface, 2.4 GHz, IEEE 802.11 b/g/n • Simultaneous connection of any number of Experimenters via serial bus system • High-quality designer casing with aluminium feet and surface-hardened Plexiglas front panel • Suitable for accommodating in training panel frames for DIN A4 training panels • Designed for connection of 2-mm safety measuring leads • Multi-coloured LEDs for displaying status • Adjustable analog output, +/-10 V, 0.2 A, DC – 5 MHz, via BNC and 2-mm sockets • 4 Analog differential amplifier inputs with 10 MHz band width, safe for voltages up to 100 V, sampling rate 100 mega samples, 9 measuring ranges, memory depth 4 x 8 k x 10 bits, inputs via BNC (2 inputs) or 2-mm sockets (4 inputs) • 2 Analog inputs for current measurement, overcurrent-protected up to 5 A, sampling rate 250 kilo samples, 2 measuring ranges, resolution 12 bits, connection via 2-mm sockets • 3 variable analog outputs +/- 20V, 1 A, DC-150 Hz • 16-bit digital signal output, of which 8 bits are accessed via 2-mm sockets, TTL/CMOS, clock frequency 0 – 100 kHz, electric strength +/- 15 V • 16-bit digital signal input, of which 8 bits are accessed via 2-mm sockets, memory depth 16 bit x 2 k, TTL/CMOS, sampling rate 0 – 100 kHz, electric strength +/- 15 V, • 8 Relays, 24 V DC/1 A, of which 4 are accessed via 2-mm sockets • Dimensions: 29.6 x 19 x 8.6 cm • External power supply with wide range input 100-264 V, 47-63 Hz, output 24 V / 5 A Virtual instruments (meters and sources): • 2 x Voltmeter VIs, 2 x Ammeter VIs: AC, DC, 9 ranges, 100 mV to 50 V, true RMS, AV • 1 x Power meter, 9 ranges, 100 mV to 50 V • 1 x VI with 8 relays, 1 x Multimeter VI: multimeter display in browser • 1 x 2-channel ammeter VI: AC, DC, 2 ranges, 300 mA and 3 A, TrueRMS, AV • 1 x 2-channel voltmeter VI: AC, DC, 9 ranges, 100 mV to 50 V, TrueRMS, AV • 1 2-/4-channel oscilloscope: band width 10 MHz, 25 time ranges, 100 ns/div to 10 s/div, 9 ranges 20 mV/div to 10 V/div, trigger and pre-trigger,		

	XY and XT modes, cursor function, addition and multiplication function for 2 channels • 1 x VI Spectrum Analyzer: 9 voltage ranges 100 mV to 50 V, input frequency range 3 Hz to 1 MHz, time domain display • 1 X VI Bode-Plotter: 9 voltage ranges 100 mV to 50 V, frequency range 1 Hz - 5MHz, time domain display and locus diagram • 1 x Adjustable DC voltage VI 0 - 10 V • 1 x Function generator VI: 0.5 Hz - 5 MHz, 0 - 10 V, sine, square, triangular, • 1 x Arbitrary generator VI, 1 x Pulse generator VI • 1 x VI with 16 digital outputs, 1 x VI with 16 x digital inputs, 1 x VI with 16 digital input/outputs. Display modes: binary, hex, decimal and octal numerals • 1 x Three-phase power supply VI, 0 - 150 Hz, 0 - 14 Vrms, 2 A • 1 x Adjustable DC power supply VI, 3 x (-20 V - +20 V), 2 A • 1 x Three-phase power supply VI with additional phase-shift and clock rate adjustment <u>Inclusion:</u> • Interface • Power supply • Power lead • USB cable • CD with basic software • Operating manual		
	e.) Experimenter (2 units)		
	Experimenter for coupling to the Interface or to other Experimenter modules. Equipment: • Connects to the Interface and additional Experimenters via bus • bus connection for experiment cards • High-quality designer casing with aluminium feet and surface-hardened Plexiglas front window • Suitable for accommodating training panel frames for DIN A4 training panels • Fixed and variable voltages available via 8 2-mm sockets • Designed for connection of 2-mm safety measuring leads • Accommodates experiment cards • Eject mechanism for experiment cards with return spring • Accommodates a breadboard for experimenting with discrete components and integrated circuits • Accommodates a multimeter using IrDa interface		
	f.) Measurement accessories, shunts and connection cables (1 set)		
	• 6 Shunt resistors: 2 x 1 ohm, 2 x 10 ohm, 2 x 100 ohm • Screen print of symbols for identifying resistors, the voltage taps and current inputs • 24 x 2-mm sockets • Dimensions: 100 x 40 mm Set of connection cables 2 mm (28 pcs) consisting of: • 8 x connection leads 2 mm, 15 cm, blue • 4 x connection leads 2 mm, 15 cm, yellow • 5 x connection leads 2 mm, 45 cm, black • 2 x connection leads 2 mm, 45 cm, yellow • 5 x connection leads 2 mm, 45 cm, red • 2 x connection leads 2 mm, 45 cm, blue • 1 x safety adapter lead 4 mm to 2mm, 50 cm, black		

	• 1 x safety adapter lead 4 mm to 2mm, 50 cm, red • 10 x 2-mm connector plugs / Plug spacing 5 mm, white		
	g.) Connection cable for PROFIBUS, 1.5m; 2xConnection plug (1 unit)		
	h.) Safety measurement cable (4 mm), 100cm/40", blue, 600 V, CAT III ' 1000 V, CAT II / 32 A (1 unit)		
	i.) Safety measurement cable (4mm), 100cm/40", red, 600 V, CAT III ' 1000 V, CAT II / 32A (1 unit)		
	j.) Serial interface cable 9/9 pole (1 unit)		
	k.) Laptop with specifications: i7 8th Gen Processor, 8gb RAM, 1TB HDD, 15" display, 4gb video card (2 units)		
3	Robot Technology for mechatronics applications		
	Composition:		
	a.) Sorting station (1 unit)		
	• Gravity-feed magazine • Micro switch for monitoring magazine level • Two-waystopcylinder • Magnetic end-limit sensor • 1 x Sortingcylinders • 1 x 3/2 wayvalves • 1 x 4/2-way valve • Pneumaticvalve block • PLC interface: 25-pin SUB-D connector • PLC requirements: 2 x digital outputs, 2 x digital inputs		
	b.) Workpiece, bottom section, white (1 unit)		
	• *Material:* plastic • *Colour:* white • Magnetic clip for attachment to top section • *Dimensions (LxWxH):* (100 x 50 x 40) mm / 3,9" x 1,97" x 1,57"		
	c.) Workpiece, bottom section, black (2 units)		
	• *Material:* plastic • *Colour:* black • Magnetic clip for attachment to top section • *Dimensions (LxWxH):* (100 x 50 x 40) mm / 3,9" x 1,97" x 1,57"		
	d.) 25-pin serial interface cable, Sub-D plug/socket (1 unit)		
	e.) Compressor, low-noise (1 unit)		
	Extremely quiet compressed air system with compressor motor, thermo switch and automatic pressure switch. Tanks made of special steel with security valve and non-return valve, master pressure gauge, condensation drain, stop valve and maintenance unit • Motor output: 0.34 k W • Suction capacity: 50 l / min • Power consumption at 8 bars: 2.9 A • Pressure: 8 bars • Tank capacity: 15 l. • Noise level: 40 d B (A) / 1 m • Operating voltage: 230 V AC • incl. tube and connection nset		
	f.) Tubing and accessory set for mechatronics systems (1 unit)		
•	• 1 x Compressor connector with plug-in sleeve 8 mm • 1 x Plug adapter 6 mm / 8 mm • 1 x Plug adapter 4 mm / 6 mm • 2 x Angle connectors 4 mm • 5 x T-connectors 4 mm • 5 x T-connectors 6 mm • 5 x T-connectors with 6 mm / 4 mm adapters • 20 m polyurethane tubing, 4 mm		

	• 10 m polyurethane tubing, 6 mm • 10 Stoppers for plug connectors 4 mm • 1 x 3/2 directional control valve, manual, 5 mm • 1 x Tube cutter		
	g.) Laptop with specifications: i7 8th Gen Processor, 8gb RAM, 1TB HDD, 15" display, 4gb video card (2 units)		
4	Compact automation		
	Composition:		
	a.) Course - Automation Technology 1: Fundamentals of PLC technology (1 set)		

	Inclusion:
	
	Experiment board PLC trainer
	• CPU with PLC functionality
	• 8 digital inputs with simulation switches and status LEDs
	• 8 digital outputs with status LED connected to 2 mm sockets
	• 8 analog inputs with 10 bit resolution, of which 4 inputs 0-10 V and 4 inputs 4-20 mA
	• 4 analog outputs, of which 2 outputs 0-10 V and 2 outputs 4-20 mA
	• 1 potentiometer for simulation of an analog 0-10 V signal via 2 mm sockets
	• 1 potentiometer for simulation of an analog 4-20 mA signal via 2 mm sockets
	• LAN switch with three connection terminals
	• 9-pin D-Sub socket with connection to digital inputs and outputs of the PLC
	• 25-pin D-Sub socket with connection to digital inputs and outputs of the PLC
	• Status LED of the PLC
	• Browser and course software
	
	Experiment board PLC training applications
	The board is subdivided into four topic areas.
	• Digital technology
	  ○ To convey the basics of digital technology components without using a PLC
	  ○ 2 AND gates each with two inputs
	  ○ 2 OR gates each with two inputs
	  ○ 2 Negations
	  ○ 1 XOR with two inputs
	  ○ 1 RS flipflop
	  ○ 1 SR flipflop
	• Traffic light control
	  ○ T-intersection with traffic lights for pedestrians and street traffic
	  ○ 11 LEDs to indicate traffic light signals
	  ○ 8 2-mm input sockets for control of traffic light LEDs
	  ○ 2 pushbuttons for simulation of press prompt at the pedestrian crosswalk
	  ○ 1 pushbutton for simulation of the request contact on the street
	  ○ 2 2-mm output sockets for the request signals
	  ○ 25-pin D-Sub connector plug with connection to digital inputs and outputs of the model for quick connection to the PLC
	• Sensors / actuators
	  ○ Analog value processing by two sensors and two actuators
	  ○ Temperature sensor with 2 mm sockets for tapping analog temperature signal
	  ○ Light sensor with 2 mm sockets for tapping analog brightness signal		

	○ Lamp with 2 mm sockets for analog control of lamp brightness ○ Motor with 2 mm sockets for analog control of motor speed • 7 segment display ○ Two 7-segment displays ○ 6 sockets for control of the 7-segment displays ○ 1 pushbutton with socket for display activation ○ 25-pin D-Sub connector plug with connection to digital inputs and outputs of the model for quick connection to the PLC <u>Training contents:</u> • PLC fundamentals and basic concepts • Design and operation • Logical operations, memory functions, timer and counter functions, signal edge evaluation, control of program sequence, analog value processing • Addressing • Program structures • Project planning of automation systems • Programming with ST, FBD or KOP according to IEC 1131 • Basic logical operations in ST • Basic logical operations in FBD • Basic logical operations in KOP • Combined basic logical operations • Memory chips • Function blocks • Program structures • Analog value processing • Sequence control systems • Project planning in digital technology • Project planning in traffic light control • Project planning in analog value processing • Project planning with 7-segment displays		
	b.) Interface with virtual instruments (1 set)		
	<u>Equipment:</u> • 32-bit processor with storage memory for measurements • USB interfaces, transfer rate 12 Mbits/s • WLAN/WiFi interface, 2.4 GHz, IEEE 802.11 b/g/n • Simultaneous connection of any number of Experimenters via serial bus system • High-quality designer casing with aluminium feet and surface-hardened Plexiglas front panel • Suitable for accommodating in training panel frames for DIN A4 training panels • Designed for connection of 2-mm safety measuring leads • Multi-coloured LEDs for displaying status • Adjustable analog output, +/-10 V, 0.2 A, DC – 5 MHz, via BNC and 2-mm sockets • 4 Analog differential amplifier inputs with 10 MHz band width, safe for voltages up to 100 V, sampling rate 100 mega samples, 9 measuring ranges, memory depth 4 x 8 k x 10 bits, inputs via BNC (2 inputs) or 2-mm sockets (4 inputs) • 2 Analog inputs for current measurement, overcurrent-protected up to 5 A, sampling rate 250 kilo samples, 2 measuring ranges, resolution 12 bits, connection via 2-mm sockets • 3 variable analog outputs +/- 20V, 1 A, DC-150 Hz • 16-bit digital signal output, of which 8 bits are accessed via 2-mm sock-ets, TTL/CMOS, clock frequency 0 – 100 kHz, electric strength +/- 15 V		

	• 16-bit digital signal input, of which 8 bits are accessed via 2-mm sockets, memory depth 16 bit x 2 k, TTL/CMOS, sampling rate 0 – 100 kHz, electric strength +/- 15 V, • 8 Relays, 24 V DC/1 A, of which 4 are accessed via 2-mm sockets • Dimensions: 29.6 x 19 x 8.6 cm • External power supply with wide range input 100-264 V, 47-63 Hz, output 24 V / 5 A <u>Virtual instruments (meters and sources):</u> • 2 x Voltmeter VIs, 2 x Ammeter VIs: AC, DC, 9 ranges, 100 mV to 50 V, true RMS, AV • 1 x Power meter, 9 ranges, 100 mV to 50 V • 1 x VI with 8 relays, 1 x Multimeter VI: multimeter display in browser • 1 x 2-channel ammeter VI: AC, DC, 2 ranges, 300 mA and 3 A, TrueRMS, AV • 1 x 2-channel voltmeter VI: AC, DC, 9 ranges, 100 mV to 50 V, TrueRMS, AV • 1 2-/4-channel oscilloscope: band width 10 MHz, 25 time ranges, 100 ns/div to 10 s/div, 9 ranges 20 mV/div to 10 V/div, trigger and pre-trigger, XY and XT modes, cursor function, addition and multiplication function for 2 channels • 1 x VI Spectrum Analyzer: 9 voltage ranges 100 mV to 50 V, input frequency range 3 Hz to 1 MHz, time domain display • 1 X VI Bode-Plotter: 9 voltage ranges 100 mV to 50 V, frequency range 1 Hz - 5MHz, time domain display and locus diagram • 1 x Adjustable DC voltage VI 0 - 10 V • 1 x Function generator VI: 0.5 Hz - 5 MHz, 0 - 10 V, sine, square, triangular, • 1 x Arbitrary generator VI, 1 x Pulse generator VI • 1 x VI with 16 digital outputs, 1 x VI with 16 x digital inputs, 1 x VI with 16 digital input/outputs. Display modes: binary, hex, decimal and octal numerals • 1 x Three-phase power supply VI, 0 - 150 Hz, 0 - 14 Vrms, 2 A • 1 x Adjustable DC power supply VI, 3 x (-20 V - +20 V), 2 A • 1 x Three-phase power supply VI with additional phase-shift and clock rate adjustment <u>Includes:</u> • Interface • Power supply • Power lead • USB cable • CD with basic software • Operating manual		
	c.) Measurement accessories, shunts and connection cables (1 set)		
	• 6 Shunt resistors: 2 x 1 ohm, 2 x 10 ohm, 2 x 100 ohm • Screen print of symbols for identifying resistors, the voltage taps and current inputs • 24 x 2-mm sockets • Dimensions: 100 x 40 mm Set of connection cables 2 mm (28 pcs) consisting of: • 8 x connection leads 2 mm, 15 cm, blue • 4 x connection leads 2 mm, 15 cm, yellow • 5 x connection leads 2 mm, 45 cm, black • 2 x connection leads 2 mm, 45 cm, yellow • 5 x connection leads 2 mm, 45 cm, red		

	• 2 x connection leads 2 mm, 45 cm, blue • 1 x safety adapter lead 4 mm to 2mm, 50 cm, black • 1 x safety adapter lead 4 mm to 2mm, 50 cm, red • 10 x 2-mm connector plugs / Plug spacing 5 mm, white		
	d.) Patch cable Cat6 2m, grey (1 set)		
	e.) USB 2.0 Ethernet adapter, 10/100 (1 set)		
	f.) 25-pin serial interface cable, Sub-D plug/socket (1 set)		
	g.) storage case for experiment board (1 set)		
	h.) Laptop with specification: i7 8th Gen Processor, 8gb RAM, 1TB HDD, 15" display, 4gb video card (1 unit)		
	BIDDER ADDITIONAL REQUIREMENTS:		
	1. THREE (3) YEARS WARRANTY ON GOODS AND SERVICES		
	2. BIDDER SHOULD PROVIDE RE-TRAINING DURING WARRANTY PERIOD FREE OF CHARGE		
	3. ITEM NO. 1 TO 3 SHOULD BE INTEGRATED		

For guidance and information of all concerned.

EDNA P. YUMOL, CPA, PhD
BAC Chairperson

Date Issued: May 8, 2020
Copy furnished: Prospective Bidders