

**ERASMUS +**

**CAPACITY BUILDING IN THE FIELD OF HIGHER EDUCATION**

**Erasmus+ Project**

Modernization of Mechatronics and Robotics for Bachelor degree in Uzbekistan through Innovative Ideas and Digital Technology
(MechaUz)

**Invitation to Tender for Equipment Procurement –**

**Mechatronics and Robotics LAB**

**(Uzbekistan)**

#MECHAUZ2020

Dear Sir/Madam,

We kindly invite you to submit your **tender documents for the supply of Equipment to the Mechatronics and Robotics LAB in Tashkent University of Information Technologies (TUIT)** (see the technical specifications provided in the Annex 2) within the framework of the Project *“Modernization of Mechatronics and Robotics for Bachelor degree in Uzbekistan through Innovative Ideas and Digital Technology”* – MechaUz, co-funded by the **ERASMUS+ Programme of the European Union**.

When preparing your tender documents, please be guided by the invitation to tender.

Tenders should be submitted in English **by Email** tomechauz.2020@gmail.com not later than **15.09.2020** (Tashkent local time).

We kindly ask you to ensure that the tender is **signed, stamped, and in the PDF format**. An acknowledgement of receipt will be sent to you accordingly.

In all cases, please add the below reference: #MECHAUZ2020 “Invitation to Tender for Mechatronics and Robotics LAB in Tashkent University of Information Technologies (Uzbekistan)”.

*For any additional information, please, contact us* ***only*** *by Email.*

Dr. Utkir Khamdamov

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Tashkent city,

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# Annex 1: Company Information Sheet

#MECHAUZ2020 “Invitation to Tender for Equipment Procurement –
Mechatronics and Robotics LAB in Tashkent University of Information Technologies (Uzbekistan)”

*Please, fill in all fields.*

|  |
| --- |
| **Bidder’s Information** |
| **Company legal name**  |  |
| **Company legal address**  |  |
| **Company E-Mail** |  |
| **Company authorized representative**(name, address, telephone number(s), fax number(s) and e-mail address) |  |
| **Attached are copies of the following documents:*** A photocopy of the trade name registration papers
 |

# Annex 2: Equipment Description

#MECHAUZ2020 “Invitation to Tender for Equipment Procurement – Mechatronics and Robotics LAB in Tashkent University of Information Technologies (Uzbekistan)”

*Please, fill in all fields.*

|  |
| --- |
| **Mechatronics and Robotics LAB: //The table of equipment required for TUIT** |
| **#** | **Required Technical Specifications and Standards** | **Quantity** |
| ***#1C*** | ***NI ELVIS III*** | ***3 pcs*** |
| **1** | **Oscilloscope:*** 4 ch
* 400 MS/s
* 14 bits
 |  |
| **2** | **Function Generator:*** 2 ch
* 100 MS/s
* 15 MHz,
* 14 bits
 |  |
| **3** | **Logic Analyzer/Pattern Generator:*** 16 ch,
* 100 MS/s
 |  |
| **4** | **IV Analyzer:*** ±10 V
* ±30 mA
* 5 MHz
 |   |
| **5** | **Digital Multimeter:*** 4½ digits
 |  |
| **6** | **Variable Power Supply:*** ±15 V
* 500 mA
 |   |
| **7** | **AI/AO:*** 16 ch, 16 bits/4 ch, 16 bits
 |  |
| **8** | **DIO:*** 40 ch
 |  |
| **9** | **SFP Support:*** Windows
 |  |
| ***#2C*** | ***NI ELVIS III Cables & Probes*** | ***3 pcs*** |
|  |  |  |
|   |
| ***#3C*** | ***NI ELIVS III Power Cord*** | ***3 pcs*** |
|  |  |  |
|  |
| ***#4C*** | ***Quanser Mechatronics Sensors Board for NI ELVIS III*** | ***1 pc*** |
| **1** | **Key features:*** 11 Sensors
* Ready to use
* Easy Operation
* Accelerate Discovery
 |  |
| **2** | **Courseware:*** Sensor behaviour
* Filtering and statistical analysis of raw sensor data
* Deflection and natural frequency measurement using strain gage
* Pressure transducer calibration
* Angular displacement measurement
* Encoder decoding
* Long and mid-range distance measurement
* Proximity detection
* Switch debouncing
* Temperature calibration and measurement
* Capacitive touch sensing
* Roll, pitch, and yaw measurements using an IMU
 |  |
|  |
| ***#5C*** | **Quanser Mechatronics Actuators Board for NI ELVIS III** | ***1 pcs*** |
| **1** | **Key features:*** Four Complete Actuator Systems
* Open and Customizable
* Comprehensive Courseware
* Accelerate Discovery
 |  |
| **2** | **Courseware:*** DC Motors: Brushed DC motors, brushless DC motors, design considerations
* Power Amplifiers: Linear power amplifiers, pulse width modulation amplifier, design considerations
* Position Controlled Actuators: Stepper motors, servomechanical actuators, design considerations
 |  |
|  |
| ***#6C*** | ***Quanser Mechatronics Systems Board for NI ELVIS III*** | ***1 pc*** |
| **1** | **Key features:*** Complete System
* Open and Customizable
* Comprehensive Courseware
* Accelerate Discovery
 |  |
| **2** | **Courseware:*** Manipulator Control: Motor interfacing, forward and inverse kinematics, PID motor control
* Processing Images: Image thresholding, blob detection, pattern matching
* System Level Control: State machines, task-space control, goal directed line following
 |  |
|  |
| ***#7C*** | ***Quanser Controls Board for NI ELVIS III*** | ***1 pc*** |
| **1** | **Key features:*** Highly Linear Motor Response
* Open and Customizable
* Complete Package
* Simulink® Compatibility
 |  |
| **2** | **Courseware:*** DC Motor Modelling: First principles, experimental, frequency
* Speed Control: PID control, lead compensators
* Position Control: PID control, steady-state error
* Stability: BIBO, Nyquist, Routh Hurwitz
* Inverted Pendulum Control: Pole placement, LQR, swing-up
* Digital Control: Quantization, matched pole-zero, digital design
 |  |
|  |
| ***#8C*** | ***Digilent Digital Electronics for NI ELVIS III*** | ***3 pcs*** |
| **1** | **Specifications:*** Digital electronics teaching platform
* Programmable with Multisim, LabVIEW, and Vivado
* Integrates with NI ELVIS III
* Zynq XC7Z020 FPGA
 |  |
| **2** | **Peripherals:*** Audio codec in and out jacks
* Headphone and microphone jacks
* VGA and HDMI connector
* Ethernet connector
* MicroSD port
* 8 LEDs, 8 slide switches, 4 push buttons
* 3 PMOD connectors
* Expansion connector
* Capacitive touchscreen
* OLED 12 × 32 monochrome display
* 4-digits 7-segments LEDs
* Expansion connector
* Breadboard
 |  |
| **3** | **NI ELVIS Integrations:*** 2 and 8 channel oscilloscope
* Bode plotter
* Digital multi-meter (DMM)
* Function generator
* Arbitrary waveform generator
* Octave analyser
* Digital reader/writer
* Dynamic signal analyser
* Digital waveform viewer
* Variable supply
* Audio Equalizer
* Impedance analyser
* DC level
* Data logger
* 2 and 3 wire current-voltage analyzer
 |  |
|  |

# Annex 3: Commercial Offer

Note –

*The Company must accomplish the commercial offer for equipment on its letterhead clearly showing the companies complete name and address.*

To: The Rector of TUIT

Prof. Tulkin Teshabaev

|  |
| --- |
| ***Commercial offer for the equipment supply within the framework of the project*** ***Modernization of Mechatronics and Robotics for Bachelor degree in Uzbekistan through Innovative Ideas and Digital Technology (MechaUz)***#MECHAUZ2020 “Invitation to Tender for Equipment Procurement – Mechatronics and Robotics LAB in Tashkent University of Information Technologies (Uzbekistan)” |

Name of Company \_\_ **\_\_\_\_\_\_\_\_\_**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Mechatronics and Robotics LAB**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item** | **Description** | **Quantity****(pcs) for 1 University** | **Unit Price (EUR)** | **Total Price per item (EUR) for 1 University** |
| **1** | **2** | **4** | **5** | **6=4 х 5** |
| #1C | NI ELVIS III | 3 |  |  |
| #2C | NI ELVIS III Cables & Probes | 3 |  |  |
| #3C | NI ELIVS III Power Cord | 3 |  |  |
| #4C | Quanser Mechatronics Sensors Board for NI ELVIS III | 1 |  |  |
| #5C | Quanser Mechatronics Actuators Board for NI ELVIS III  | 1 |  |  |
| #6C | Quanser Mechatronics Systems Board for NI ELVIS III  | 1 |  |  |
| #7C | Quanser Controls Board for NI ELVIS III  | 1 |  |  |
| #8C | Digilent Digital Electronics for NI ELVIS III  | 3 |  |  |
| **Total Amount (Euro) excluding VAT** |  |

Total amount in words: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If there is a discrepancy between words and figures, the amount in words shall prevail

Warranty conditions:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Delivery conditions:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Delivery period:

\_\_\_\_\_\_ Days from the date of signature of the contract

Name

In the capacity of

Signed

Duly authorized to sign the company for and on behalf of

Date

Stamp