

TENDER DOCUMENTS

Mechanical Lab Equipment

NUTECH / SCM /Mech Lab Eqpt (Phase III A) 2020 / TD-121

NATIONAL UNIVERSITY OF TECHNOLOGY

TENDER NOTICE

National University of Technology (NUTECH) NUTECH / SCM / Mechanical Lab Eqpt (PSDP) 2020 / TD-121

Sealed bids are invited from Government / FBR Registered Firms for the procurement of Mechanical Lab Equipment for NUTECH on **CPT Basis**.

1. Tender documents containing terms, conditions and detailed specifications of items (including draft contract) can be downloaded from NUTECH website "<u>https://nutech.edu.pk</u>" w.e.f **15 Feb 2020**.

2. Quotations shall be submitted as per requirement of the tender documents.

3. Bidders will be required to submit **Bank Draft / CDR** equal to **5%** of quoted value as Bid Bond in favor of National University of Technology (NUTECH).

4. Sealed bids with detailed specifications should reach on the following address latest by **1100 hours on 18 March 2020.** Late submission will not be entertained.

5. Bids will be opened at **1130 hours** on **18 March 2020 at** SCM Office.

6. Project is to be completed in **90 days** from the date of award of contract.

7. <u>Submit Rs 1500/- as Tender fee in favor of NUTECH HBL Account (NUTECH</u> <u>Tendering and Contracts, 5037-7000210755).</u> Please attach bank receipt with technical offer. Offers will not be entertained without payment of processing fee.

Deputy Director (Supply Chain Management) NATIONAL UNIVERSITY OF TECHNOLOGY, UPROAD, I-12, ISLAMABAD Tel: 0092-51-5476768, Ext: 227

NATIONAL UNIVERSITY OF TECHNOLOGY SUPPLY CHAIN MANAGEMENT INVITATION TO TENDER

Tender submission time: 1100 hours, 18 March 2020

1. NUTECH desires to procure the list of item(s) / Store(s) on <u>CPT</u> <u>basis</u>. as per Annexure-A. Interested bidders are requested to send their bids through courier or deliver at NUTECH under "<u>Single Stage – Two Envelopes</u>" (two <u>envelopes placed together in third envelope</u>), marked clearly as "Technical <u>Offer</u>" and "Commercial Offer" respectively to the undersigned, latest by or before above mentioned due date.

2. <u>Conditions Governing Contracts.</u> The contract made as result of this IT will be in accordance with the draft contract published on NUTECH University website and other special conditions (Mentioned in this document) that may be added to given contract for the supply of Lab Equipment.

- 3. Delivery of Tender. The offer is to be submitted as under:
 - a. <u>Technical Offer.</u> Technical Offer should contain only Annexure-A, Annexure-A-1 & Annexure B duly filled in (supported with relevant technical literature / details / catalogues etc) and receipt of tender processing fee. Copy of bid bond WITHOUT MENTIONING PRICE should be attached with technical offer. Only relevant technical details ie literature/brochures) without mentioning the financial aspect of the offer in DUPLICATE should be enclosed in an envelope. In technical proposal, all items must have the brand names, model number, manufacturer's name, country of origin, manufacturer's warranty including parts with complete specs and brochures. Re-conditioned and re-furbished equipment shall not be acceptable. Following information will be clearly marked on the envelope:
 - (1) Technical Offer
 - (2) Original Performa Invoice (without price)
 - (3) Tender number
 - (4) Date/ time of opening

- b. <u>Commercial Offer.</u> Commercial Offer will contain Annexure-C and bid bond (Dully mentioned and placed in separate envelope. The offer indicating the quoted price FE/Local Currency (in Local Currency for FOR cases & in FE for FOB cases) in figures as well as in words would be enclosed in an envelope. Following information will be clearly marked on the envelope;
 - (1) Commercial Offer
 - (2) Original Performa invoice with price
 - (3) Tender number
- c. Both the envelopes i.e. commercial offer and technical offer would be enclosed in yet another properly sealed envelope that will be marked with address of this office only. There should be clear indication that this envelope contains tender documents.
- d. The tender duly sealed will be addressed to the following:-

Deputy Director (Supply Chain Management Office) NATIONAL UNIVERSITY OF TECHNOLOGY (NUTECH) IJ P ROAD, I-12 ISLAMABAD Tel: 0092-51-5476768, Ext: 227

4. <u>Date and Time for Receipt of Tender.</u> Sealed bids with detailed specifications should reach SCM office latest by **1100 hours on 18 March 2020.** Delay occurring in post shall not be accepted. Tenders received after the appointed / fixed time will NOT be entertained. The appointed time will, however, fall on next working day in case of closed / forced holiday.

5. <u>Tender opening.</u> The offers shall be opened 30 minutes after submission time. Commercial offers will be opened at later stage if Technical Offer is found acceptable on examination by technical authorities. Date and time for opening of commercial offer shall intimated later. Only legitimate / registered representatives of firm will be allowed to attend tender opening.

6. <u>Validity of Offer.</u> The validity period of quotations must be indicated and should be 90 days from the date of opening of financial offer.

7. **Documents.** Following information / copy of documents must be provided / attached with offer:-

- a. A copy of letter showing firm's financial capability.
- b. NTN/GST number be mentioned on the offer and copy of registration Certificate issued by Sales Tax Department, attached.
- c. Foreign supplier to provide its Registration Number issued by respective Department of Commerce authorizing export of subject stores (in FOB cases).
- d. Annexes A, A-1, B and C and special conditions must be signed and stamped. ATTACH ONLY RELEVANT DOCUMENTS.
- e. Complete all Annexes as per given format. Do not use your format or letter head. Offer may be rejected if given format is not followed.
- f. OEM/principal agency agreement must be provided.
- 8. **Disqualification.** Offers are liable to be rejected if:
 - a. Validity of offer is not quoted as required in IT documents.
 - b. Any deviation from the General/ Special / Technical Instructions.
 - c. Offers are found conditional or incomplete in any respect.
 - d. Copy of EM/Bid Bond & Tender processing fee (with tech offer) and original EM/Bid Bond (with fin offer) are NOT attached.
 - e. Multiple rates are quoted against one item.
 - f. Manufacturer's relevant brochures and technical details on major equipment assemblies are not attached in support of specifications.
 - g. Offer received later than appointed / fixed date and time.
 - h. Subject to restriction of export license.
 - Offers (Commercial / technical) containing non-initialled / unauthenticated amendments / corrections / overwriting. If the validity of the agency agreement has expired. The commercial offer against FOB / CIF / C&F tender quoted in local currency.

j. If the offer is found to be based on cartel action in connivance with other sources/participants of the tender.

9. **Earnest Money / Bid Bond.** Commercial Offer must be accompanied with a Bid Bond (CDR/Pay Order/Bank Draft) in agreement of faithful compliance of the conditions of Contract. This amount will be equivalent to 5% of the total quoted value. The Bid Bond amount submitted by the successful bidder will however be refunded on effective termination of Contract. (The Bid Bond will be forfeited in case of default by the bidder from his commitments made through his offer). Submission of Bid Bond is mandatory; otherwise your offer will be rejected. Bid Bond will be used as performance guarantee till the delivery of stores, otherwise separate performance guarantee valued at 5 % of contract will be submitted by successful firm till stores are delivered and inspected.

10. Return of Earnest Money/Bid Bond.

- a. Bid Bond to the unsuccessful bidders will be returned on finalization of the lowest evaluated bidder.
- Bid Bond of the successful bidder/bidders will be returned on submission of Bank Guarantee/Bid bond against warranty period OR Bid bond retained for the warranty period as the case may be.

11. Terms of Payment/ LC Charges

- a. In FOB cases (all categories) payment will be made through letter of credit (LC). LC opening charges in Pakistan are to be borne by NUTECH. Payment will be made through irrevocable LC in favour of Manufacturer/Principal.
- b. In FOR cases 50% advance payment will be made to the Seller on provision of unconditional Bank Guarantee/ CDR/ DD/ Pay order. 50% payment will made to the Seller after receipt and confirming the correctness of ordered specifications, installation, commissioning OR as the case may be.

12. <u>Bank Guarantee (BG)</u>. In case where equipment is backed by warranty, the BG submitted equal to 05% of FOB/FOR/CPT etc value shall remain valid for up to 60 days beyond completion of warranty period. **2 years** warranty against **5% Bank Guarantee** of the store value will be required from the successful bidders from the date of commissioning as performance bond.

13. <u>Taxes/ Duties/ Custom clearance</u> All taxes /duties /import Licenses Fee as applicable under government laws in Pakistan as well as country of supplier shall be on firm (in FOR Case). NUTECH will provide applicable exemption certificates and documents (In FOB Cases only).

14. **Insurance:** Insurance cover by the firm through NICL (in FOB Cases).

15. <u>Freight charges /Misc charges:</u> All charges such as packing, forwarding, local freight, loading and unloading, installation and commissioning, custom clearance, orientations, on job training or any other will be part of quoted price. Delivery till NUTECH will be firm's responsibility and all associated costs will be part of quotation as well.

16. <u>Warranty</u>. All goods /store offered would be brand new, from current year of production and will be governed as per warranty clause. The warranty period may be covered by BG as depending on the value /criticality of the tender equipment.

17. **Delivery Schedule.** Store will be delivered within 90 days from contract signing date.

18. **Force Majeure.** If non-compliance with the period of delivery or services can be proved to be due to Force Majeure, such as but not limited to mobilization, war, riot, strike, lockout or the occurrence of unforeseen events, the period shall be reasonably extended.

19. **Subletting** Suppliers are not allowed to sublet wholly or part of the contract to any other firm /company without prior permission by NUTECH. Firm found in breach of the clause will be dealt with as per purchaser's right and discretion.

20. <u>Arbitration.</u> The dispute shall referred for adjudication to a board comprising of Pro-Rector NUTECH as Chairman and two arbitrators, one to be nominated by each party. The arbitration proceeding shall be held in Pakistan under Pakistan Law. The venue of arbitration shall be the place from which the contract is issued or such other place as the purchaser at his discretion may determine. Arbitration award so given will be firm and final.

21. <u>**Redress Of Grievance.**</u> In case of dispute, case shall be reviewed by 'NUTECH Redress of grievance committee and decision of NUTECH shall be final and binding on both parties.

22. <u>Export License/Permit /End User Cert.</u> It shall be the responsibility of the Supplier to obtain from the Government concerned all permits and export licenses,

etc required to enable each consignment to be shipped immediately as per the delivery schedule. In case the supplier fails to arrange export license within 30 days of signing the contract the purchaser reserves the right to cancel the contract on the risk and expense of the supplier without prior notice. The purchaser will provide End User Certificate for acquisition of export license to the supplier (format to be provided by the supplier for respective country within 10 day of signing of the contract).

23. <u>Technical Specification:</u> The supplier will provide OEM certificate, quality certificate /inspection document to the purchaser confirming the quality of the product being supplied under this contract .Store must bear the manufacturer's identification marking /monogram.

24. <u>Inspection /Testing of Store</u>: Inspection testing will be carried out at NUTECH by the concerned inspection team as detailed by the respective department in accordance with the laid down Acceptance Criteria. (Acceptance Test Procedure (ATPs)/Drawing /Test standard and specification). The supplier will provide ATPs with technical offer. Mutually agreed/approved ATPs will form part of contract to govern the inspection of store subsequently.

25. <u>**Requirement of Samples.**</u> The requirement of tender sample will be included in the case if required for evaluation by technical authorities'. Beside this advance sample if required will be also made part of the IT as well as the contract.

26. <u>Change In Specification / Mfr / Model.</u> No alternation marked/brand and quality of store will be entertained after the tender have been opened.

27. <u>Checking of Store at Consignee End.</u> All stores will be checked at Consignee's end in the presence of the supplier's representative. If for some reason, the supplier decides not to nominate his representative for such checking, an advance written notice to this effect will be given by the supplier to the consignee prior to immediately on shipment of store. In such an event the supplier will clearly undertake that decision of consignee with regard to quantities and description of consignment will be taken as final and discrepancy found will be accordingly made up by supplier. In all other cases the consignee will inform the supplier about arrival of consignment immediately on receipt of store through registered email/letter and telephone. If no response from the supplier is received within 15 days from initiation letter the consignee will have the right to proceed with the checking without

supplier's representative .Consignee's report on checking of the stores will be binding on the supplier in such cases.

28. <u>Packing /Marking.</u> The supplier shall be responsible for proper packing of the Store in standard export packing worthy of transportation by sea /air /road rail so as to ensure their content being free from lose or damages due to faulty packing on arrival at the ultimate destination. Packing of stores will be done at the expenses of the supplier. All packing cases, containers and other packing material shall become the property of the NUTECH on receipt. Any loss occurred /demurrage paid due to wrong marking will be made good by the supplier

29. **Original Performa Invoice**: Original Performa invoice must have following components incorporated:-

- a. HS Code
- b. Incoterm
- c. Payment Terms
- d. Origin of good
- e. Port of shipment
- f. Address of OEM
- g. Seller acceptance (on Performa Invoice)
- h. Invoice Date
- i. Latest date of shipment
- j. Seller complete bank detail

Note: Performa Invoice in the name of NUTECH in case of FOB cases & in the name of local partner in case of FOR cases.

- 30. **General Instructions:** Following must be noted:-
 - The firm should provide point to point acceptance of each clause of IT and special instructions attached with IT.
 - b. Firm will render a certificate with technical offer that firm is neither defaulter nor blacklisted by any Government / semi Government organization directly or indirectly.
 - c. Rates should be quoted on Free Delivery basis at NUTECH Islamabad.
 - d. The stipulated delivery period should be strictly adhered to. Any anticipated delay that is beyond the control of Seller will be informed (in writing) well in advance of the expiry of the due date of the activity

along with reasons thereof, requesting for the grant of extension in delivery period. If the Seller fails to do so, or the Buyer is not convinced with the rationale provided by the Seller, Liquidated Damages up to/at 2% per month or part thereof, will be imposed. However, the maximum limit of the Liquidated Damages will not exceed 10% of the delayed store value.

- e. If even after applicability of 10% LD, the Seller fails to deliver the required stores, the Buyer will be at liberty to Cancel the contract, and /or procure the stores from an alternate source, on the Seller's "Risk & Cost/Expense". In that case, the Seller will be bound to make payment to the new source through NUTECH. The purchaser's decision under this clause shall NOT be subjected to arbitration.
- f. NUTECH reserves the right to cancel the Contract without assigning any reason whatsoever during its currency / execution / after placement, if the firm is found to be involved in any dubious activity, litigation, lacking to meet contractual obligations with the purchaser or is blacklisted with any other Public procurement agency. No claims / loss /damage of whatsoever nature shall be entertained and NUTECH's decision in this regard will be final / binding on the Seller.
- g. An appropriate amount may be paid for mobilization against Bank Guarantee/CDR/Demand Draft/Pay Order.
- h. Firms with previous pending/outstanding projects/business with NUTECH may not be considered for award of this tender.

Deputy Director Supply Chain Management Office

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<u>Annex-A</u>

Technical Specifications

NUTECH / SCM /Mech Lab Eqpt (Phase III A) 2020 / TD-121

Ser	Part	Items	Description	Country	A/U	Qty	Bidder		Tech Scru	utiny to be
	No			of		Req	Compliance		done k	y user
				Origin			Yes	No	Accepted	Rejected
									Reason of	Rejection
1.		Fundamentals of Statics Apparatus with modules like suspension cable, equilibrium of rigid bodies, equilibrium of forces, equilibrium of beam	 Unit should have different modules like suspension cable, equilibrium of rigid bodies, equilibrium of forces, equilibrium of beam Easy mounting of various experimental components. Large size and clear metric grid for accurate results. Wide range of mountings: cables, rods, pulleys, pulley blocks, pivot bearings and torque disks. Force gauges for calculation of tensile and compressive force Suspension Cable Demonstration Minimum 2x Magnetic Chain Sprockets Minimum 3x Magnetic Hook Assemblies Chain approximately Minimum 1180 mm long, 825 g – 0.699 kg.m⁻¹ (6.86 N.m⁻¹) Minimum 2x Spring Balances with at least 10 N range and 0.1 N or 	Europe/U SA	No	1				

	smaller increment scale
	Moight Llongers et least 9 off 10 g
	• Weight Hangers – at least 8 oil, 10 g
	each
	• Weights 150 x 10 g
	At least 10 Weight hooks
	Equilibrium of a Rigid Body
	Minimum 15 meters of cord
	Minimum 1x Ladder Model,
	Minimum 1x Magnetic Hook
	Assembly
	Minimum 1x Spring Balance with at
	least 10 N range and 0.1 N or
	smaller increment scale
	Minimum 2x Magnetic Mounts
	Minimum 2x Magnetic Mounts
	Minimum 3X Magnetic Pulley
	Assemblies
	• Weight Hangers – at least 2 off, 10 g
	each
	Minimum Weights 150 x 10 g
	At least 8x Weight hooks
	Equilibrium of Forces
	Minimum 15 meters of cord
	Minimum 1x Ladder Model,
	Minimum 1x Magnetic Hook
	Assembly
	Minimum 2x Magnetic Protractors
	• 1x Spring Balance with at least 10 N
	range and 0.1 N or smaller
	increment scale
	Minimum 5x Magnetic Pulley
	Assemblies
	• Weight Hangers – at least 4 off 10 g

			1 T	
	Weights 250 x 10 g			
	Minimum 8x Weight hooks			
	Minimum 2x Split Rings			
	Equilibrium of a Beam			
	Minimum 1x Beam Model,			
	Minimum 2x Magnetic Hook			
	Assemblies			
	Minimum 2x Spring Balances with at			
	least 10 N range and 0.1 N or			
	smaller increment scale			
	• Weight Hangers –at least 4 off, 10 g			
	each			
	Weights 200x 10 g			
	Minimum 8x Weight hooks			
	Minimum 2x Split Rings			
	Experimental Capabilities			
	Suspension Cable Demonstration			
	Analysis using catenary and			
	parabola theory			
	Cable weight and tension			
	Comparison of a symmetrical			
	suspension cable and catenary			
	Unsymmetrical suspension cable			
	A point load on a suspension cable			
	Equilibrium of a Rigid Body			
	• For complete range of experiments			
	that explore the classic 'forces			
	around a ladder' problem			
	Equilibrium of Forces			
	Concurrent and non-concurrent			
	coplanar forces			
	An introduction to Bow's Notation			
	and graphical analysis			

		 Force triangles, polygons and Link polygons Equilibrium of a Beam Concurrent and non-concurrent coplanar forces An introduction to Bow's Notation and graphical analysis Force triangles, polygons and Link polygons
2	Heat Exchange Base Service U Apparatus with DAQ and following modules	 Common unit for various modules as mentioned in the list. For heating, pumping the water and controlling the direction of water flows and for measuring temperature, and flow rates of Cold and hot water Covered Stainless steel tank (Min capacity 30 L), with Electric heating element (approximately 3000 W), thermostat for heating water, ("J" type Temperature sensor, mechanism to control the water level, drain valve Variable speed Centrifugal pump with range 0 – 3 l/min or more. Flow sensors for hot and cold water, range: 0.25 – 5 l/min or higher. Control valves for the cold and hot water. Four ball valves for controlling cocurrent or counter-current flux in the exchanger. Two ball valves to control and drain

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		 the hot water of the base unit. Maximum pressure in exchangers 0.6 bar with regulator Flexible tubes to connect with the different exchangers. DAQ System for Real time curves representation 					
		 about system responses Real time PID control for parameters 					
2a	Extended Concentric Tube Heat Exchanger Apparatus	 Compatible with Item S No 2 Main metallic elements made of stainless steel Exchange length not less than 4 m Internal tube with thickness not less than 10⁻³ m Heat transfer internal area: A_h = 0.0503 m². or more Heat transfer external area: A_c = 0.0565 m² or more External tube with thickness not less than 10⁻³ m Ten temperature sensors ("J" type): Five temperature sensors for measuring cold water temperature at inlet, three different interim positions, and outlet. Five temperature sensors for measuring hot water temperature at inlet, three different interim positions and outlet 	Europe/U SA	No	1		

		 exchanger and the study of losses. Exchanger effectiveness determination. NTU Method. Study of the heat transfer under counter-current and co-current flow conditions. Flow influence on the heat transfer. Reynolds number calculation. Additional practical possibilities: Control system: Temperature sensors calibration. Study of the hysteresis of the flow sensor 					
21	Extended Plate Heat Exchanger Apparatus	 Compatible with Item S No 2 Main metallic elements made of stainless steel. Flow rate approximately 12m³/h Maximum work pressure: 10 bar Maximum work temperature: 100 °C Minimum number of plates: 100 °C Minimum number of plates: 15 Area: 0.32 m² or more Ten temperature sensors ("J" type) Five temperature sensors for measuring cold water temperature (inlet and outlet). Five temperature sensors for measuring hot water temperature (inlet and outlet and interim positions). DAQ and software 	Europe/U SA/UK	No	1		

		 Global energy balance in the heat exchanger and the study of losses. Exchanger effectiveness determination. NTU Method. Study of the heat transfer under counter-current and co-current flow conditions. Flow influence on the heat transfer. Reynolds number calculation. Additional practical possibilities: Control system: Temperature sensors calibration. Control system: Flow sensors calibration. Study of the hysteresis of the flow sensor
20	Shell & Tube Heat Exchanger Apparatus	 Compatible with Item S No 2 Formed by tubes of stainless steel with hot water circulating in the interior Four segmented baffles located transversally in the shell Exchange length of the shell and each tube: L = 0.5 m minimum Internal tube (21 tubes) minimum Internal heat transfer area: A_h= 0.0126 m². External heat transfer area: A_c= 0.0157 m². Tube thickness not less than 10⁻³ m Shell Thickness not less than 6 X 10⁻³ m Seven temperature sensors ("J"

	 type), for measuring cold and hot water temperatures at different points of the exchanger. See through outer shell. DAQ and software
	Experimental Capabilities:-
	- Clabel energy belance in the best
	• Global energy balance in the heat exchanger and the study of losses.
	Exchanger effectiveness
	determination. NTU Method.
	Study of the heat transfer under
	counter-current and co-current flow conditions.
	• Flow influence on the heat transfer
	Reynolds number calculation.
	Additional practical possibilities:
	Control system: Temperature sensors calibration.
	Control system: Flow sensors calibration.
	Study of the hysteresis of the flow
	sensor
1	

Firm Name:	
Signature:	
Name:	
Designation:	

Annex A-1

Special Instructions

Description			Bid	der	Tech Scrutiny to be done by User		
		Yes	No	Alternate Offer	Accepted	Rejected	Reasons of
							Rejection
Environment Cond	litions						
(a) Temperature	range: 05°C to +40°C						
(b) Relative hum	idity: 0-70% non-condensing						
Warranty period	Two years from the date of commissioning.						
Training Notes	Supplier will provide a set of handouts for training on						
operation and maint	enance of the equipment						
Publications	Supplier is to provide hard and soft copies (CD) of						
following manuals.							
(a) Operational	/ Maintenance manual: - Qty 01 with Equipment and						
additional Qty 02 for	r record purposes and should consist of following sections:-						
(1)Equipment	Description /Operation:-						
	(a) Specifications						
	(b) Description						
	(c) Operation						
(2)Servicing:-							
	(a) Maintenance Schedule						
	(b) Adjustment / test						
	(c) Removal / Installation procedure						
(d) Tools Required							
(3) Trouble shooting guide							
(4) Cleaning requirements							
(b) Full parts de	scription along with detailed diagrams (exploded view).						
(c) Experiment	al manuals which must contain the list and procedure of						
the experiments that	t equipment can perform.						

Spares / Technical Support				
(a) Supplier to have in-country spares / technical support and ensure spares				
and technical support / assistance for next 10 years				
(b) Comprehensive list of spares required for scheduled maintenance of				
Equipment is to be provided				
(c) Any software provided must have its license				
(d) Software upgrade support must be provided free of cost for 10 x years with				
renewed license at every upgrade				
(e) Supplier must also provide calibration service for at least 5 years after				
commissioning				
Additional Spare / Replaceable parts.				
(a) Replaceable spare / parts during scheduled inspections are to be identified and provided as per requirement along with equipment				
sufficient to cater five years consumption				
(b) All specialized / standard tools required for inspection / repair /				
servicing must be supplied along with equipment.				
Physical Inspection Criteria: 100% physical inspection of store will be carried				
out before commissioning of the equipment for following details:-				
(a) For physical damage, scratches and deformity.				
(b) Accessories /components as per contractual specifications.				
(c) Technical Manuals (Operation manual, user guide).				
(d) Quality certificate and calibration certificate by the OEM				
(e) OEM certificate and verifiable documents by the supplier that				
store has been procured from certified source and is factory new				
(f) Brend name and equation.				
(i) Brand name and country of origin.				
Commissioning			 	
(a) Commissioning by OEM rep at his own cost and risk at designated				
place at NUTECH.				
(b) Any special requirement for installation, operation and				
commissioning must be specified in the offer by the supplier.				

Training				
01 week OEM operational/ maintenance training at NUTECH				
Improvement and Safety Measures				
Any improvement and safety measures suggested by NUTECH during				
commissioning are to be resolved by the supplier / manufacturer at no extra				
cost.				
Liability of Supplier				
(a) OEM certificate of authorized dealership Supplier is to provide				
original OEM certificate of subject equipment bought directly from the				
manufacturer and being an authorized dealer.				
(b) In case the equipment supplied is not compatible with				
specifications, the supplier will be obliged to call his representatives at				
his own cost for consultation and corrective action				
Special Notes				
(a) Additional requirements for the maintenance of equipment (if any)				
must be intimated by the supplier in technical offer.				
(b) Supplier must provide the list of organizations using same				
equipment in Pakistan (if any).				
(c) Equipment must be a standard product of OEM available at web				
address of OEM.				
(d) In case of premature failure of the equipment, OEM has to				
replace / rectify the item free of cost. Required transportation charges				
would be borne by the supplier.				

Firm Name:	
Signature:	
Name:	
Designation:	 _



<u>Annex-B</u>

TECHNICAL OFFER

NUTECH / SCM /Mech Lab Eqpt (Phase III A) 2020 / TD-121

Fill in following essential parameters:-

- 1. Validity of Offer: _____Days (Should not be less than **90 days**)
- 2. Delivery period: _____Days (After placement of order)
- 3. Country of Origin: _____
- 4. Warranty Period: ____

<u>General</u>

- 1. GST Number: _____ (Enclose Copy)
- 2. NTN / CNIC: _____ (if exempted, provide valid exemption certificate)

Payment Terms

- 1. 80 % through LC on sight
- 2. 20% after delivery, installation / commissioning, user satisfaction certificate

Details of Foreign Principal Information with account details)

- 1. Name / Title: _____
- 2. Address:

OEM Name:	Firm Name:	Signature:
OEM Focal Person:	Firm Focal Person:	Official Seal:
OEM Phone Number:	Firm Phone Number:	Name:
OEM Email Id:	Firm Email Id:	Designation:

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Annex C

FINANCIAL OFFER

NUTECH / SCM /Mech Lab Eqpt (Phase III A) 2020 / TD-121

Ser	Part No	Item Name/Size	Specification	A/U	Qty Req	Price Per Unit	Total Price
1.		Fundamentals of Statics Apparatus with modules like suspension cable, equilibrium of rigid bodies, equilibrium of forces, equilibrium of beam	 Unit should have different modules like suspension cable, equilibrium of rigid bodies, equilibrium of forces, equilibrium of beam Easy mounting of various experimental components. Large size and clear metric grid for accurate results. Wide range of mountings: cables, rods, pulleys, pulley blocks, pivot bearings and torque disks. Force gauges for calculation of tensile and compressive force Suspension Cable Demonstration Minimum 2x Magnetic Chain Sprockets Minimum 3x Magnetic Hook Assemblies Chain approximately Minimum 1180 mm long, 825 g - 0.699 kg.m⁻¹ (6.86 N.m⁻¹) Minimum 2x Spring Balances with at least 10 N range and 0.1 N or smaller increment scale Weight Hangers – at least 8 off, 10 g each Weights 150 x 10 g At least 10 Weight hooks Equilibrium of a Rigid Body Minimum 1x Ladder Model, Minimum 1x Magnetic Hook Assembly Minimum 1x Spring Balance with at least 10 N range and 0.1 N or smaller increment scale 	No	1		

	Minimum 2v Magnetic Mounts		
	Minimum 2x Magnetic Pullov Assemblies		
	Weight Hangers at least 2 off 10 g asab		
	• Weight Hangers – at least 2 off, 10 g each		
	IVIIIIIIIIIIIVVeignis 150 x 10 g		
	At least 8x weight hooks		
	Equilibrium of Forces		
	Minimum 15 meters of cord		
	Minimum 1x Ladder Model,		
	Minimum 1x Magnetic Hook Assembly		
	Minimum 2x Magnetic Protractors		
	 1x Spring Balance with at least 10 N range and 0.1 N or 		
	smaller increment scale		
	 Minimum 5x Magnetic Pulley Assemblies 		
	 Weight Hangers – at least 4 off, 10 g each 		
	 Weights 250 x 10 g 		
	Minimum 8x Weight hooks		
	Minimum 2x Split Rings		
	Equilibrium of a Beam		
	Minimum 1x Beam Model,		
	 Minimum 2x Magnetic Hook Assemblies 		
	 Minimum 2x Spring Balances with at least 10 N range and 		
	0.1 N or smaller increment scale		
	 Weight Hangers –at least 4 off, 10 g each 		
	 Weights 200x 10 g 		
	Minimum 8x Weight hooks		
	Minimum 2x Split Rings		
	Experimental Capabilities		
	Suspension Cable Demonstration		
	 Analysis using catenary and parabola theory 		
	Cable weight and tension		
	 Comparison of a symmetrical suspension cable and 		

		 catenary Unsymmetrical suspension cable A point load on a suspension cable Equilibrium of a Rigid Body For complete range of experiments that explore the classic 'forces around a ladder' problem Equilibrium of Forces Concurrent and non-concurrent coplanar forces An introduction to Bow's Notation and graphical analysis Force triangles, polygons and Link polygons Equilibrium of a Beam Concurrent and non-concurrent coplanar forces An introduction to Bow's Notation and graphical analysis Force triangles, polygons and Link polygons Force triangles, polygons and Link polygons 			
2	Heat Exchanger Base Service Unit Apparatus with DAQ and following modules	 Common unit for various modules as mentioned in the list. For heating, pumping the water and controlling the direction of water flows and for measuring temperature, and flow rates of Cold and hot water Covered Stainless steel tank (Min capacity 30 L), with Electric heating element (approximately 3000 W), thermostat for heating water, ("J" type Temperature sensor, mechanism to control the water level, drain valve Variable speed Centrifugal pump with range 0 – 3 l/min or more. Flow sensors for hot and cold water, range: 0.25 – 5 l/min or higher. Control valves for the cold and hot water. Four ball valves for controlling co-current or counter-current flux in the exchanger. Two ball valves to control and drain the hot water of the base unit. Maximum pressure in exchangers 0.6 bar with regulator 	No	1	

						1
			• Flexible tubes to connect with the different exchangers.			
			DAQ System for			
			 Real time curves representation about system responses 			
			\circ Real time PID control for parameters involved in the			
			process			
			Compatible with Item S No 2			
			 Main metallic elements made of stainless steel 			
			 Exchange length not less than 4 m Internal tube with 			
			thickness not less than 10 ⁻³ m			
			 Heat transfer internal area: A_h = 0.0503 m². or more 			
			 Heat transfer external area: A_c = 0.0565 m² or more 			
			 External tube with thickness not less than 10⁻³ m 			
			 Ten temperature sensors ("J" type): 			
			\circ Five temperature sensors for measuring cold water			
			temperature at inlet, three different interim positions, and			
			outlet.			
		Extended Concentric	\circ Five temperature sensors for measuring hot water			
:	2a	Tube Heat Exchanger	temperature at inlet, three different interim positions and outlet	No	1	
		Apparatus	Experimental Capabilities:-			
			Global energy balance in the heat exchanger and the study			
			of losses.			
			 Exchanger effectiveness determination. NTU Method. 			
			• Study of the heat transfer under counter-current and co-			
			current flow conditions.			
			• Flow influence on the heat transfer. Reynolds number			
			calculation.			
			 Additional practical possibilities: 			
			Control system: Temperature sensors calibration.			
			Control system: Flow sensors calibration.			
			 Study of the hysteresis of the flow sensor 			

2b	Extended Plate Heat Exchanger Apparatus	 Compatible with Item S No 2 Main metallic elements made of stainless steel. Flow rate approximately 12m³/h Maximum work pressure: 10 bar Maximum work temperature: 0 °C Minimum number of plates: 15 Area: 0.32 m² or more Ten temperature sensors ("J" type) Five temperature sensors for measuring cold water temperature (inlet and outlet). Five temperature sensors for measuring hot water temperature (inlet and outlet and interim positions). DAQ and software Experimental Capabilities:- Global energy balance in the heat exchanger and the study of losses. Exchanger effectiveness determination. NTU Method. Study of the heat transfer under counter-current and cocurrent flow conditions. Flow influence on the heat transfer. Reynolds number calculation. Additional practical possibilities: Control system: Temperature sensors calibration. 	No	1	
2c	Shell & Tube Heat Exchanger Apparatus	 Compatible with Item S No 2 Formed by tubes of stainless steel with hot water circulating in the interior Four segmented baffles located transversally in the shell Exchange length of the shell and each tube: L = 0.5 m minimum 	No	1	

Total		
 See through outer shell. DAQ and software Experimental Capabilities:- Global energy balance in the heat exchanger and the study of losses. Exchanger effectiveness determination. NTU Method. Study of the heat transfer under counter-current and co-current flow conditions. Flow influence on the heat transfer. Reynolds number calculation. Additional practical possibilities: Control system: Temperature sensors calibration. Study of the hysteresis of the flow sensor 		
 Internal tube (21 tubes) minimum Internal heat transfer area: A_h= 0.0126 m². External heat transfer area: A_c= 0.0157 m². Tube thickness not less than 10⁻³ m Shell Thickness not less than 6 X 10⁻³ m Seven temperature sensors ("J" type), for measuring cold and hot water temperatures at different points of the exchanger. See through outer shell. DAQ and software 		

Firm Name:	
Signature:	
Name:	
Designation:	

Tender No	
Name of the Firm	
Firm Address	
Date	
Telephone No	
E-Mail	

Τo,

DD SCM Office NUTECH University I-12, Main IJP Road, Islamabad.

Dear Sir

1. I / We hereby offer to supply to the NUTECH University the stores detailed in schedule to the tender inquiry or such portion thereof as you may specify in the acceptance of tender at the price offered against the said schedule and further agree that this offer will remain valid up to 90 days after opening of Financial offer and will not be withdrawn or altered in terms of rates quoted and the conditions already stated therein or on before this date. I / we shall be bound by a communication of acceptance to be dispatched within he prescribed time.

2. I / we have understood the instructions to Tenders and General Conditions Governing Contract available at NUTECH website and have thoroughly examined the specifications / drawing and / or patterns quoted in the schedule here to and am/are fully aware of the nature of the stores required and my/ our offer is to supply stores strictly in accordance with the requirements.

Yours Faithfully.

(Signature of Tenderer) Designation Date:

Individual signing tender and / or other documents connected with a contract must be signed by principal authorized rep/ OEM rep/ Authorized partner firm rep.

BANK GUARANTEE AGAINST "ADNVANCE/PERFORMANCE/WARRANTY GUARANTEE Which ever is applicable

Guarantee No
Date: _____

Amount:

Valid upto: _____

In Favour of:

National University of Technology (NUTECH), IJP Road, I-12, Islamabad.

Subject: In compliance with terms of Advance/Performance/Warranty Guarantee Bank Guarantee

Contract No: _____

dated_____

Dear Sir,

1. Whereas your good-self have entered into Contract No: ______ dated _____ with M/s [Firm Name] Located at [Firm Address], Herein after referred to as our customer and that one of the conditions of the Contract is submission of Bank Guarantee by our customer to your good-self for a sum of [Amount].

2. Incompliance with this stipulation of subj contract, we hereby agree and undertake as under:-

- a. To pay to you unconditionally on demand and / or without any reference to our Customer an amount not exceeding the sum of [Amount] as would be mentioned in your written Demand Notice.
- b. To keep this Guarantee in force till [Validity Date].
- c. That the validity of this Bank guarantee shall be kept two clear year ahead of the original / extended delivery period or the warrantee of the stores which so ever is later in duration on receipt of information from your office. Our liability under this Bank Guarantee shall cease on the closing of banking hours on the last date of validity of this Bank Guarantee. Claim received there after shall not been entertained by us whether you suffer a loss or not. On receipt of payment under this Guarantee, this

documents i.e., Bank Guarantee must be clearly cancelled, discharged and returned to us.

- d. That we shall inform your office regarding termination of the validity of this bank Guarantee one clear month before the actual expiry date of this Bank Guarantee.
- e. That Bank shall inform your office regarding termination of the validity of this bank Guarantee one clear month before the actual expiry date of this Guarantee.
- f. That with the consent of our customer you may amend / alter any term / cause of the contractor add / delete any term / clause to / from this contract without making any reference to us. We do not reserve any right to receive any such amendment / alternation or addition / deletion provided such like actions do not increase our monetary liability under this Bank Guarantee which shall be limited only [Amount.....].
- g. That the bank guarantee herein before given shall not be affected by any change in the constitution of the Bank or Customer / Supplier or Vendor.
- h. That this is an unconditional Bank guarantee, which shall been cashed on sight on presentation without any reference to our Customer / Supplier or Vendor.

Signature	
Name	
Desig	
Bank Stamp	

Note: No changes in the above given BG format shall be accepted.

"SELLER'S WARRANTY"

(To be provided on stamp paper)

Contract No: _____

Dated: _____

Validity 2 years from the date of final acceptance of the Stores.

1. We hereby guarantee that we are the genuine and original Source of provisioning the Stores to our Buyer. We also undertake that nothing in the manufacturing of these Stores has been obtained through unauthorized means.

2. We hereby warrant and undertake that the Stores and all the associated spares/ accessories supplied under the terms and conditions of the above Contract, are:

- a. brand new, complete in all respects, possessing good quality and standard workmanship; and
- b. liable for replacement/rectification free of charge, if during the Warranty period the same are found defective before or under normal use or these do not remain within the limits and tolerances stated under the specifications or in any way not in accordance with the terms of this Contract. All expenses incurred in removal, reprovisioning and reinstallation of such defective Stores or their parts shall also be borne by us.

3. The Warranty shall remain valid for a period of <u>2</u> years from the date of final acceptance of the Stores.

Signature	
Name	
Desig	_
Stamp	
Date	

CHECK LIST

(This checked list must be attached with your technical offer, duly filled and

Signed by authorized signatory)

Tender No_____

Date_____

1	Tender Processing	a. Tender processing fee ref no		
	Fee	b. Bank		
		c. Amount		_
2	EM/ Bid Bond	a. EM/ Bid Bond ref no		_
		b. Bank		-
3	Form Annex A, A-1, B and C signed by Authorized		Yes	No
	Signatory			
4	Offering specification of items as per IT		Yes	No
5	Quoted Currency as per IT		Yes	No
6	Accounting unit/Qty as per IT		Yes	No
7	Delivery Schedule as per IT		Yes	No
8	Country of origin of store			
9	Name of OEM:			
10	Original Performa invoice (Mandatory)		Yes	No
11	Certified that there is no Deviation from IT conditions/ Yes No			
	there is deviation from IT condition as per fol details			
12	Blacklisting certificate.		Yes	No
13	Verifiable OEM Certificate		Yes	No
14	Warranty Period as	per IT	Yes	No
15	ATPs provided		Yes	No

Note: Fill and/or mark Yes/No where required

Signature of Firm Auth Signatory