Republic of the Philippine
TARLAC STATE UNIVERSITY
Romulo Blvd., San Vicente, Tarlac City
Tel. No.: (045) 982 4630
Website: www.tsu.edu.ph

Bidding Documents

(This Bidding Documents is in conformance with the Sixth Edition of the Philippine Bidding Documents for the Procurement of Goods)

For the Project

Supply, Delivery, and Installation of Laboratory Equipment for CE & ME of the College of Engineering (APP 2024)

With an Approved Budget for the Contract (ABC) *of*
Forty Two Million Four Hundred Ten Thousand Five Hundred Pesos (₱ 42,410,500.00)

Invitation to Bid No. Goods 2024-023

PhilGEPS Reference No.: 10816261

July 2020
6th Edition

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Glossary of Acronyms, Terms, and Abbreviations

ABC – Approved Budget for the Contract.

BAC – Bids and Awards Committee.

Bid – A signed offer or proposal to undertake a contract submitted by a bidder in response to and in consonance with the requirements of the bidding documents. Also referred to as *Proposal* and *Tender.* (2016 revised IRR, Section 5[c])

Bidder – Refers to a contractor, manufacturer, supplier, distributor and/or consultant who submits a bid in response to the requirements of the Bidding Documents. (2016 revised IRR, Section 5[d])

Bidding Documents – The documents issued by the Procuring Entity as the bases for bids, furnishing all information necessary for a prospective bidder to prepare a bid for the Goods, Infrastructure Projects, and/or Consulting Services required by the Procuring Entity. (2016 revised IRR, Section 5[e])

BIR – Bureau of Internal Revenue.

BSP – Bangko Sentral ng Pilipinas.

Consulting Services – Refer to services for Infrastructure Projects and other types of projects or activities of the GOP requiring adequate external technical and professional expertise that are beyond the capability and/or capacity of the GOP to undertake such as, but not limited to: (i) advisory and review services; (ii) pre-investment or feasibility studies; (iii) design; (iv) construction supervision; (v) management and related services; and (vi) other technical services or special studies. (2016 revised IRR, Section 5[i])

CDA - Cooperative Development Authority.

Contract – Refers to the agreement entered into between the Procuring Entity and the Supplier or Manufacturer or Distributor or Service Provider for procurement of Goods and Services; Contractor for Procurement of Infrastructure Projects; or Consultant or Consulting Firm for Procurement of Consulting Services; as the case may be, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

CIF – Cost Insurance and Freight.

CIP – Carriage and Insurance Paid.

CPI – Consumer Price Index.

DDP – Refers to the quoted price of the Goods, which means "delivered duty paid."

DTI – Department of Trade and Industry.

EXW – Ex works.

FCA – "Free Carrier" shipping point.

FOB – "Free on Board" shipping point.

Foreign-funded Procurement or Foreign-Assisted Project– Refers to procurement whose funding source is from a foreign government, foreign or international financing institution as specified in the Treaty or International or Executive Agreement. (2016 revised IRR, Section 5[b]).

Framework Agreement – Refers to a written agreement between a procuring entity and a supplier or service provider that identifies the terms and conditions, under which specific purchases, otherwise known as "Call-Offs," are made for the duration of the agreement. It is in the nature of an option contract between the procuring entity and the bidder(s) granting the procuring entity the option to either place an order for any of the goods or services identified in the Framework Agreement List or not buy at all, within a minimum period of one (1) year to a maximum period of three (3) years. (GPPB Resolution No. 27-2019)

GFI – Government Financial Institution.

GOCC – Government-owned and/or –controlled corporation.

Goods – Refer to all items, supplies, materials and general support services, except Consulting Services and Infrastructure Projects, which may be needed in the transaction of public businesses or in the pursuit of any government undertaking, project or activity, whether in the nature of equipment, furniture, stationery, materials for construction, or personal property of any kind, including non-personal or contractual services such as the repair and maintenance of equipment and furniture, as well as trucking, hauling, janitorial, security, and related or analogous services, as well as procurement of materials and supplies provided by the Procuring Entity for such services. The term "related" or "analogous services" shall include, but is not limited to, lease or purchase of office space, media advertisements, health maintenance services, and other services essential to the operation of the Procuring Entity. (2016 revised IRR, Section 5[r])

GOP – Government of the Philippines.

GPPB – Government Procurement Policy Board.

INCOTERMS – International Commercial Terms.

Infrastructure Projects – Include the construction, improvement, rehabilitation, demolition, repair, restoration or maintenance of roads and bridges, railways, airports, seaports, communication facilities, civil works components of information technology projects, irrigation, flood control and drainage, water supply, sanitation, sewerage and solid waste management systems, shore protection, energy/power and electrification facilities, national buildings, school buildings, hospital buildings, and other related construction projects of the government. Also referred to as *civil works or works*. (2016 revised IRR, Section 5[u])

LGUs – Local Government Units.

NFCC – Net Financial Contracting Capacity.

NGA – National Government Agency.

PhilGEPS - Philippine Government Electronic Procurement System.

Procurement Project – refers to a specific or identified procurement covering goods, infrastructure project or consulting services. A Procurement Project shall be described, detailed, and scheduled in the Project Procurement Management Plan prepared by the agency which shall be consolidated in the procuring entity's Annual Procurement Plan. (GPPB Circular No. 06-2019 dated 17 July 2019)

PSA – Philippine Statistics Authority.

SEC – Securities and Exchange Commission.

SLCC – Single Largest Completed Contract.

Supplier – refers to a citizen, or any corporate body or commercial company duly organized and registered under the laws where it is established, habitually established in business and engaged in the manufacture or sale of the merchandise or performance of the general services covered by his bid. (Item 3.8 of GPPB Resolution No. 13-2019, dated 23 May 2019). Supplier as used in these Bidding Documents may likewise refer to a distributor, manufacturer, contractor, or consultant.

UN – United Nations.

Section I. Invitation to Bid

Republic of the Philippine
TARLAC STATE UNIVERSITY
Romulo Blvd., San Vicente, Tarlac City
Tel. No.: (045) 982 4630
Website: www.tsu.edu.ph

INVITATION TO BID

For the Project

Supply, Delivery, and Installation of Laboratory Equipment for CE & ME of the College of Engineering (APP 2024)

Invitation to Bid No. Goods 2024-023

1. The Tarlac State University, through Regular Agency Fund (RAF) and Special Fund (SB) 2024 intends to apply the sum of **Forty Two Million Four Hundred Ten Thousand Five Hundred Pesos 42,410,500.00)** to payments under the contracts for the project: **Supply, Delivery, and Installation of Laboratory Equipment for CE & ME of the College of Engineering (APP 2024)**. Bids received in excess of the ABC shall be automatically rejected at bid opening.

Item No.	Description	Qty.	Unit	ABC, ₱
1.	Multi-function Data Acquisition Module for Power Engineering Trainer	1	set	860,000.00
2.	Heat Exchanger Test Bench	1	set	5,016,000.00
3.	Test Stand for Single-Cylinder Engines, 3Kw	1	set	2,970,000.00
4.	Deformation of Bars under Bending or Torsion	1	set	715,000.00
5.	Fatigue Testing Machine	1	set	1,980,000.00
6.	Radial Compressor Test Rig	1	set	1,760,000.00
7.	Comparison of Positive Displacement Pumps and Compressors Test Rig	1	set	4,070,000.00
8.	Equipment for Fundamentals of Temperature Measurement	1	set	2,145,000.00
9.	Fundamentals of Pressure Measurement	1	set	951,500.00
10.	Radial Fan Test Rig	1	set	1,650,000.00
11.	Axial Fan Test Rig	1	set	1,540,000.00
12.	Steam Power Plant	1	set	5,000,000.00
13.	Equipment for Calibration of Pressure Gauges	1	set	418,000.00
14.	Apparatus, General Purpose Drying Oven	2	set	160,000.00
15.	Vortex Apparatus	3	set	255,000.00
16.	Series and Parallel Pumps Test Rig	1	set	2,420,000.00

2. The Tarlac State University now invites bids for the project: **Supply, Delivery, and Installation of Laboratory Equipment for CE & ME of the College of Engineering (APP 2024)**. Delivery of the Goods is required within **thirty (30) calendar days** from the receipt of the Notice to Proceed. Bidders must have completed, within the last five (5) years prior to 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.

3. Bidding will be conducted through open competitive bidding procedures using a non-discretionary "pass/fail" criterion as specified in the 2016 Revised Implementing Rules and Regulations (IRR) of Republic Act (RA) 9184, otherwise known as the "Government Procurement Reform Act".

   Bidding is restricted to Filipino citizens/sole proprietorships, partnerships, or organizations with at least sixty percent (60%) interest or outstanding capital stock belonging to citizens of the Philippines, and to citizens or organizations of a country the laws or regulations of which grant similar rights or privileges to Filipino citizens, pursuant to RA 5183.

4. Interested bidders may obtain further information from **Tarlac State University** and inspect the Bidding Documents at the address given below during Tuesday to Friday from 8:00 A.M. to 5:00 P.M:

   BAC Secretariat
   Motorpool and Administration Building
   Tarlac State University
   Romulo Blvd., San Vicente, Tarlac City
   Tel. No. (045) 606-8142 / 0998 846 0206
   Email: **bacsec@tsu.edu.ph**

5. A complete set of Bidding Documents may be acquired by interested Bidders from **May 07, 2024 to May 28, 2024** from the aforementioned address upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, in the amount of **₱ 25,000.00**.

   It may also be downloaded free of charge from the website of the Philippine Government Electronic Procurement System (PhilGEPS) and the website of the Procuring Entity, provided that Bidders shall pay the applicable fee for the Bidding Documents not later than the submission of their bids.

6. The Tarlac State University will hold a Pre-Bid Conference on **May 16, 2024 (3:00 P.M.)** at the Bids and Awards Committee Conference Room, 3rd Floor, Motorpool and Administration Building, Tarlac State University, Romulo Blvd., San Vicente, Tarlac City, which shall be open to prospective bidders.

7. Bids must be duly received by the BAC Secretariat at the address below on or before **May 28, 2024, (2:30 P.M.)**.

   BAC Secretariat
   Motorpool and Administration Building
   Tarlac State University
   Romulo Blvd., San Vicente, Tarlac City
   Tel. No. (045) 606-8142 / 0998 846 0206
   Email: **bacsec@tsu.edu.ph**

8. All Bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in ITB Clause 14.

9. Bid opening shall be on **May 28, 2024,** at **3:00 P.M.**, at the Bids and Awards Committee Conference Room, 3rd Floor, Motorpool and Administration Building, Tarlac State University, Romulo Blvd., San Vicente, Tarlac City. Bids will be opened in the presence of the bidders' representatives who choose to attend.

10. The Summary of the procurement activities is as follows:

Activities	Date and Time	Venue
Pre-Bid Conference	May 16, 2024 (3:00 PM)	BAC Conference Room, 3rd Floor, Motorpool and Administration Building
Deadline of Submission of Bids	May 28, 2024 (2:30 PM)	
Opening of Bids	May 28, 2024 (3:00 PM)	

11. The Tarlac State University reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Sections 35.6 and 41 of the 2016 Revised IRR of RA 9184, without thereby incurring any liability to the affected bidder or bidders.

12. For further information, please refer to:

Ms. Jhenna Micah A. Manankil/ Mr. Joshua Jonathan S. Jacinto
BAC Secretariat
Motorpool and Administration Building
Tarlac State University
Romulo Blvd., San Vicente, Tarlac City
Tel. No. (045) 606-8142 / 0998 846 0206
Email: **bacsec@tsu.edu.ph**

DR. GRACE N. ROSETE
BAC Chairperson – Goods and Services

Section II. Instructions to Bidders

1. Scope of Bid

1.1. The Tarlac State University wishes to receive Bids for the project: **Supply, Delivery, and Installation of Laboratory Equipment for CE & ME of the College of Engineering (APP 2024),** with identification number **Invitation to Bid No. Goods 2024-021.**

1.2. The procurement project (referred to herein as "Project"") is composed of 16 (sixteen) items, the details of which are described in Section VII. Technical Specifications.

2. Funding Information

2.1. The GOP through the source of funding as indicated below for **2024** in the amount of **₱ 42,410,500.00.**

2.2. The source of funding is the **Special Budget (SB)**.

3. Bidding Requirements

3.1. The Bidding for the Project shall be governed by all the provisions of RA No. 9184 and its 2016 revised IRR, including its Generic Procurement Manuals and associated policies, rules and regulations as the primary source thereof, while the herein clauses shall serve as the secondary source thereof.

3.2. Any amendments made to the IRR and other GPPB issuances shall be applicable only to the ongoing posting, advertisement, or IB by the BAC through the issuance of a supplemental or bid bulletin.

3.3. The Bidder, by the act of submitting its Bid, shall be deemed to have verified and accepted the general requirements of this Project, including other factors that may affect the cost, duration and execution or implementation of the contract, project, or work and examine all instructions, forms, terms, and project requirements in the Bidding Documents.

4. Corrupt, Fraudulent, Collusive, and Coercive Practices

The Procuring Entity, as well as the Bidders and Suppliers, shall observe the highest standard of ethics during the procurement and execution of the contract. They or through an agent shall not engage in corrupt, fraudulent, collusive, coercive, and obstructive practices defined under Annex "I" of the 2016 revised IRR of RA No. 9184 or other integrity violations in competing for the Project.

5. Eligible Bidders

5.1. Only Bids of Bidders found to be legally, technically, and financially capable will be evaluated.

5.2. Foreign ownership limited to those allowed under the rules may participate in this Project.

5.3. Pursuant to Section 23.4.1.3 of the 2016 revised IRR of RA No.9184, the Bidder must have a SLCC that is similar to the Project, as described in the **BDS**, with a value, adjusted to current prices using the PSA's CPI, that is at least equivalent to **fifty percent (50 %) of the Total ABC (42,410,500.00).**

5.4. The Bidders shall comply with the eligibility criteria under Section 23.4.1 of the 2016 IRR of RA No. 9184.

6. Origin of Goods

There is no restriction on the origin of goods other than those prohibited by a decision of the UN Security Council taken under Chapter VII of the Charter of the UN, subject to Domestic Preference requirements under **ITB** Clause 18.

7. Subcontracts

7.1. The Bidder may subcontract portions of the Project to the extent allowed by the Procuring Entity as stated herein, but in no case more than twenty percent (20%) of the Project.

The Procuring Entity has prescribed that subcontracting is not allowed

8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time and at the address indicated in paragraph 6 of the **IB.**

9. Clarification and Amendment of Bidding Documents

Prospective bidders may request for clarification on and/or interpretation of any part of the Bidding Documents. Such requests must be in writing and received by the Procuring Entity, either at its given address or through electronic mail indicated in the **IB**, at least ten (10) calendar days before the deadline set for the submission and receipt of Bids.

10. Documents comprising the Bid: Eligibility and Technical Components

10.1. The first envelope shall contain the eligibility and technical documents of the Bid as specified in **Section VIII. Checklist of Technical and Financial Documents**.

10.2. The Bidder's **SLCC** as indicated in **ITB** Clause 5.3 should have been completed **within five (5) years** prior to the deadline for the submission and receipt of bids.

10.3. If the eligibility requirements or statements, the bids, and all other documents for submission to the BAC are in foreign language other than English, it must be accompanied by a translation in English, which shall be authenticated by the appropriate Philippine foreign service establishment, post, or the equivalent office having jurisdiction over the foreign bidder's affairs in the Philippines. Similar to the required authentication above, for Contracting Parties to the Apostille Convention, only the translated documents shall be authenticated through an apostille pursuant to GPPB Resolution No. 13-2019 dated 23 May 2019. The English translation shall govern, for purposes of interpretation of the bid.

11. Documents comprising the Bid: Financial Component

11.1. The second bid envelope shall contain the financial documents for the Bid as specified in **Section VIII. Checklist of Technical and Financial Documents**.

11.2. If the Bidder claims preference as a Domestic Bidder or Domestic Entity, a certification issued by DTI shall be provided by the Bidder in accordance with Section 43.1.3 of the 2016 revised IRR of RA No. 9184.

11.3. Any bid exceeding the ABC indicated in paragraph 1 of the **IB** shall not be accepted.

11.4. For Foreign-funded Procurement, a ceiling may be applied to bid prices provided the conditions are met under Section 31.2 of the 2016 revised IRR of RA No. 9184.

12. Bid Prices

12.1. Prices indicated on the Price Schedule shall be entered separately in the following manner:

a. For Goods offered from within the Procuring Entity's country:

i. The price of the Goods quoted EXW (ex-works, ex-factory, ex-warehouse, ex-showroom, or off-the-shelf, as applicable);

ii. The cost of all customs duties and sales and other taxes already paid or payable;

iii. The cost of transportation, insurance, and other costs incidental to delivery of the Goods to their final destination; and

iv. The price of other (incidental) services, if any, listed in e.

b. For Goods offered from abroad:

i. Unless otherwise stated in the **BDS**, the price of the Goods shall be quoted delivered duty paid (DDP) with the place of destination in the Philippines as specified in the **BDS**. In quoting the price, the Bidder shall be free to use transportation through carriers registered in any eligible country. Similarly, the Bidder may obtain insurance services from any eligible source country.

ii. The price of other (incidental) services, if any, as listed in **Section VII. Technical Specifications**.

13. Bid and Payment Currencies

13.1. For Goods that the Bidder will supply from outside the Philippines, the bid prices may be quoted in the local currency or tradeable currency accepted by the BSP at the discretion of the Bidder. However, for purposes of bid evaluation, Bids denominated in foreign currencies, shall be converted to Philippine currency based on the exchange rate as published in the BSP reference rate bulletin on the day of the bid opening.

13.2. Payment of the contract price shall be made in Philippine Pesos.

14. Bid Security

14.1. The Bidder shall submit a Bid Securing Declaration or any form of Bid Security in the amount indicated in the **BDS**, which shall be not less than the percentage of the ABC in accordance with the schedule in the **BDS**.

14.2. The Bid and bid security shall be valid until **September 25, 2024**. Any Bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

15. Sealing and Marking of Bids

15.1. Each Bidder shall submit one copy of the first and second components of its Bid.

15.2. The Procuring Entity may request additional hard copies and/or electronic copies of the Bid. However, failure of the Bidders to comply with the said request shall not be a ground for disqualification.

15.3. If the Procuring Entity allows the submission of bids through online submission or any other electronic means, the Bidder shall submit an electronic copy of its Bid, which must be

digitally signed. An electronic copy that cannot be opened or is corrupted shall be considered non-responsive and, thus, automatically disqualified.

16. Deadline for Submission of Bids

16.1. The Bidders shall submit on the specified date and time and either at its physical address or through online submission as indicated in paragraph 7 of the **IB.**

17. Opening and Preliminary Examination of Bids

17.1. The BAC shall open the Bids in public at the time, on the date, and at the place specified in paragraph 9 of the **IB**. The Bidders' representatives who are present shall sign a register evidencing their attendance. In case videoconferencing, webcasting or other similar technologies will be used, attendance of participants shall likewise be recorded by the BAC Secretariat.

In case the Bids cannot be opened as scheduled due to justifiable reasons, the rescheduling requirements under Section 29 of the 2016 revised IRR of RA No. 9184 shall prevail.

17.2. The preliminary examination of bids shall be governed by Section 30 of the 2016 revised IRR of RA No. 9184.

18. Domestic Preference

18.1. The Procuring Entity will grant a margin of preference for the purpose of comparison of Bids in accordance with Section 43.1.2 of the 2016 revised IRR of RA No. 9184.

19. Detailed Evaluation and Comparison of Bids

19.1. The Procuring BAC shall immediately conduct a detailed evaluation of all Bids rated "*passed*," using non-discretionary pass/fail criteria. The BAC shall consider the conditions in the evaluation of Bids under Section 32.2 of the 2016 revised IRR of RA No. 9184.

19.2. If the Project allows partial bids, bidders may submit a proposal on any of the lots or items, and evaluation will be undertaken on a per lot or item basis, as the case maybe. In this case, the Bid Security as required by **ITB** Clause 15 shall be submitted for each lot or item separately.

19.3. The descriptions of the lots or items are indicated in **Section VII. Technical Specifications**, and the ABCs of these lots or items are indicated in the **BDS** for purposes of the NFCC computation pursuant to Section 23.4.2.6 of the 2016 revised IRR of RA No. 9184. The NFCC must be sufficient for the total of the ABCs for all the lots or items participated in by the prospective Bidder.

19.4. The Project shall be awarded as one project having several items that shall be awarded as one contract.

19.5. Except for bidders submitting a committed Line of Credit from a Universal or Commercial Bank in lieu of its NFCC computation, all Bids must include the NFCC computation pursuant to Section 23.4.1.4 of the 2016 revised IRR of RA No. 9184, which must be sufficient for the total of the ABCs for all the lots or items participated in by the prospective Bidder. For bidders submitting the committed Line of Credit, it must be at least equal to ten percent (10%) of the ABCs for all the lots or items participated in by the prospective Bidder.

20. Post-Qualification

20.1. Within a non-extendible period of five (5) calendar days from receipt by the Bidder of the notice from the BAC that it submitted the Lowest Calculated Bid, the Bidder shall submit its latest income and business tax returns filed and paid through the BIR Electronic Filing and Payment System (eFPS) and other appropriate licenses and permits required by law and stated in the **BDS**.

21. Signing of the Contract

21.1. The documents required in Section 37.2 of the 2016 revised IRR of RA No. 9184 shall form part of the Contract. Additional Contract documents are indicated in the **BDS**.

Section III. Bid Data Sheet

<table>
<tr><th>ITB Clause</th><th></th></tr>
<tr><td>5.3</td><td>For this purpose, contracts similar to the Project shall be the supply and delivery of similar goods comprising the Project.</td></tr>
<tr><td>7.1</td><td>No further instructions.</td></tr>
<tr><td>12</td><td>The price of the Goods shall be quoted DDP Tarlac City, Philippines or the applicable International Commercial Terms (INCOTERMS) for this Project.</td></tr>
<tr><td>14.1</td><td>The bid security shall be in the form of a Bid Securing Declaration, or any of the following forms and amounts:

a. The amount of not less than two percent (2 %) of ABC, if bid security is in cash, cashier’s/manager’s check, bank draft/guarantee or irrevocable letter of credit; or

b. The amount of not less than five percent (5 %) of ABC if bid security is in Surety Bond.</td></tr>
<tr><td>19.3</td><td>The ABC for the items are:

<table>
<tr><th>Item No.</th><th>ABC, ₱</th></tr>
<tr><td>1.</td><td>860,000.00</td></tr>
<tr><td>2.</td><td>5,016,000.00</td></tr>
<tr><td>3.</td><td>2,970,000.00</td></tr>
<tr><td>4.</td><td>715,000.00</td></tr>
<tr><td>5.</td><td>1,980,000.00</td></tr>
<tr><td>6.</td><td>1,760,000.00</td></tr>
<tr><td>7.</td><td>4,070,000.00</td></tr>
<tr><td>8.</td><td>2,145,000.00</td></tr>
<tr><td>9.</td><td>951,500.00</td></tr>
<tr><td>10.</td><td>1,650,000.00</td></tr>
<tr><td>11.</td><td>1,540,000.00</td></tr>
<tr><td>12.</td><td>5,000,000.00</td></tr>
<tr><td>13.</td><td>418,000.00</td></tr>
<tr><td>14.</td><td>160,000.00</td></tr>
<tr><td>15.</td><td>255,000.00</td></tr>
<tr><td>16.</td><td>2,420,000.00</td></tr>
</table>
</td></tr>
<tr><td>20.2</td><td>No further requirements.</td></tr>
<tr><td>21.2</td><td>No further requirements.</td></tr>
</table>

Section IV. General Conditions of Contract

1. Scope of Contract

This Contract shall include all such items, although not specifically mentioned, that can be reasonably inferred as being required for its completion as if such items were expressly mentioned herein. All the provisions of RA No. 9184 and its 2016 revised IRR, including the Generic Procurement Manual, and associated issuances, constitute the primary source for the terms and conditions of the Contract, and thus, applicable in contract implementation. Herein clauses shall serve as the secondary source for the terms and conditions of the Contract.

This is without prejudice to Sections 74.1 and 74.2 of the 2016 revised IRR of RA No. 9184 allowing the GPPB to amend the IRR, which shall be applied to all procurement activities, the advertisement, posting, or invitation of which were issued after the effectivity of the said amendment.

Additional requirements for the completion of this Contract shall be provided in the **Special Conditions of Contract** (**SCC).**

2. Advance Payment and Terms of Payment

2.1. Advance payment of the contract amount is provided under Annex "D" of the revised 2016 IRR of RA No. 9184.

2.2. The Procuring Entity is allowed to determine the terms of payment on the partial or staggered delivery of the Goods procured, provided such partial payment shall correspond to the value of the goods delivered and accepted in accordance with prevailing accounting and auditing rules and regulations. The terms of payment are indicated in the **SCC**.

3. Performance Security

Within ten (10) calendar days from receipt of the Notice of Award by the Bidder from the Procuring Entity but in no case later than prior to the signing of the Contract by both parties, the successful Bidder shall furnish the performance security in any of the forms prescribed in Section 39 of the 2016 revised IRR of RA No. 9184

4. Inspection and Tests

The Procuring Entity or its representative shall have the right to inspect and/or to test the Goods to confirm their conformity to the Project specifications at no extra cost to the Procuring Entity in accordance with the Generic Procurement Manual. In addition to tests in the **SCC**, **Section IV. Technical Specifications** shall specify what inspections and/or tests the Procuring Entity requires, and where they are to be conducted. The Procuring Entity shall notify the Supplier in writing, in a timely manner, of the identity of any representatives retained for these purposes.

All reasonable facilities and assistance for the inspection and testing of Goods, including access to drawings and production data, shall be provided by the Supplier to the authorized inspectors at no charge to the Procuring Entity.

5. Warranty

6.1. In order to assure that manufacturing defects shall be corrected by the Supplier, a warranty shall be required from the Supplier as provided under Section 62.1 of the 2016 revised IRR of RA No. 9184.

6.2. The Procuring Entity shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall, repair or replace the

defective Goods or parts thereof without cost to the Procuring Entity, pursuant to the Generic Procurement Manual.

6. Liability of the Supplier

The Supplier's liability under this Contract shall be as provided by the laws of the Republic of the Philippines.

If the Supplier is a joint venture, all partners to the joint venture shall be jointly and severally liable to the Procuring Entity.

Section V. Special Conditions of Contract

GCC Clause	
1	**Delivery and Documents –** For purposes of the Contract, "EXW," "FOB," "FCA," "CIF," "CIP," "DDP" and other trade terms used to describe the obligations of the parties shall have the meanings assigned to them by the current edition of INCOTERMS published by the International Chamber of Commerce, Paris. The Delivery terms of this Contract shall be as follows: The delivery terms applicable to this Contract are delivered to Tarlac State University, Romulo Blvd., San Vicente, Tarlac City. Risk and title will pass from the Supplier to the Procuring Entity upon receipt and final acceptance of the Goods at their destination." Delivery of the Goods shall be made by the Supplier in accordance with the terms specified in Section VI. Schedule of Requirements.
	Packaging – The Supplier shall provide such packaging of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in this Contract. The packaging shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packaging case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit. The packaging, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified below, and in any subsequent instructions ordered by the Procuring Entity. The outer packaging must be clearly marked on at least four (4) sides as follows: Name of the Procuring Entity Name of the Supplier Contract Description Final Destination Gross weight Any special lifting instructions Any special handling instructions Any relevant HAZCHEM classifications A packaging list identifying the contents and quantities of the package is to be placed on an accessible point of the outer packaging if practical. If not practical the packaging list is to be placed inside the outer packaging but outside the secondary packaging.
	Transportation – Where the Supplier is required under Contract to deliver the Goods CIF, CIP, or DDP, transport of the Goods to the port of destination or such other named place of destination in the Philippines, as shall be specified in this Contract, shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price.

	Where the Supplier is required under this Contract to transport the Goods to a specified place of destination within the Philippines, defined as the Project Site, transport to such place of destination in the Philippines, including insurance and storage, as shall be specified in this Contract, shall be arranged by the Supplier, and related costs shall be included in the contract price. Where the Supplier is required under Contract to deliver the Goods CIF, CIP or DDP, Goods are to be transported on carriers of Philippine registry. In the event that no carrier of Philippine registry is available, Goods may be shipped by a carrier which is not of Philippine registry provided that the Supplier obtains and presents to the Procuring Entity certification to this effect from the nearest Philippine consulate to the port of dispatch. In the event that carriers of Philippine registry are available but their schedule delays the Supplier in its performance of this Contract the period from when the Goods were first ready for shipment and the actual date of shipment the period of delay will be considered force majeure. The Procuring Entity accepts no liability for the damage of Goods during transit other than those prescribed by INCOTERMS for DDP deliveries. In the case of Goods supplied from within the Philippines or supplied by domestic Suppliers risk and title will not be deemed to have passed to the Procuring Entity until their receipt and final acceptance at the final destination.
	Intellectual Property Rights – The Supplier shall indemnify the Procuring Entity against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the Goods or any part thereof.
4	The inspections and tests that will be conducted are: visual and sensory inspection and test.

Section VI. Schedule of Requirements

The delivery date for the Goods covered by the Contract shall be within thirty (30) calendar days upon receipt of the Notice to Proceed.

Section VII. Technical Specifications

Item No.	Description
Laboratory Equipment for CE & ME of the College of Engineering	
1.	**Multi-Function Data Acquisition** **Module For Power Engineering Trainer** A module combination of an isolated and differential oscilloscope, multimeter, wattmeter, energy analyzer and recorder designed for demonstration and laboratory experiments. Applications: Energy networks Voltage and frequency stability Load behaviour of networks Effect of harmonics Electrical machines Inrush current from transformers and machines Transformation ratio of transformers Efficiency of machines Power electronics Rectifier DC/DC converter DC/AC converter Frequency converter Filter DISPLAY & OPERATION Graphic display: 9 cm (3,5“), QVGA, colour, light (adjustable up to 400 cd/m²) Operation: Button and incremental encoder with button INPUTS & OUTPUTS Inputs: 4 isolated measurement channels CATIII 300, each with I and U measurement (max. 8 usable (max. 8 usable simultaneously) Input A-D: U and I connection via 4 mm safety sockets Measurement range U: 25/70/250/700 VAC ±36/±100/±360/±1000 VDC Measurement range I: 0.7/1.6/7/16 AAC ±1/±2.5/±10/±16 ADC Sampling rate: max. 1.000.000 values/s per channel for U, max. 500.000 values/s for I GENERAL Data storage: integrated micro-SD card (4 GB) for more than a thousand measurement files and screenshots Remote access: full remote access and distribution of measurement data WLAN: as access point or client USB port: Type C Advanced Features: •Simultaneous measurement of U, I, φU, φI, f and P •Instantaneous values U, I and P •Averaged values U, I and P •RMS values (AC+DC) U and I •Fundamental wave filters •Delta connection adjustment •Measuring accuracy U,I is at 0,5%. •Frequency response voltage: 100 kHz 3 dB 250 V •Frequency response current: 40 kHz 3 dB at 10 A •Universal connection options via USB connection

	with PC or laptop or via WiFi with the school network or setting up an access point •Automatic or manual range selection •Electrical power calculation S, P, QC and QL •Electrical work WS, W and WQ •Resistance calculation R, Z, XC, XL, G, Y, BC and BL •Positive sequence component, negative sequence component and zero sequence component in 3-phase system •Time derivative, integral over time, FFT analysis, mean value, histogram, and modelling Advanced Features: •Possibility of direct manual operation of the device by means of a rotary selector with cursor keys direct value readings on 9 cm backlit display •Display of up to 24 measured values on one display •Display of all values for each channel •Display of all values in tabular form •Display of measured values in a diagram •Display of a vector diagram Delivery: 120 days Warranty: One (1) year against factory defects and Two (2) years after-sales service and support Must include on-site training to TSU Faculty
2.	**Heat Exchanger Test Bench** Measuring the transfer characteristics of different heat exchanger models Specification - Supply unit for heat exchangers - Hot water circuit with tank, heater, temperature controller, pump, and protection against lack of water - Cold water circuit from laboratory water supply - Temperature controller controls the temperature of hot water - Flow adjustable using valves - Digital displays for 6 temperature and 2 flow rate sensors - Water connections with quick-release couplings - Stirring machine connection with speed adjustment - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data: Pump: power consumption of at least 120W, max. flow rate of at least 600L/h and max. head of 30m Heater: power output of not more than 3kW, thermostat setting from 0 to70°C Hot water tank: approx. 10L Specification: - Shell and tube heat exchanger (cross-flow) for connection to Heat Exchanger Test Bench - Hot and cold-water supply from Heat Exchanger Test Bench - Cross parallel flow and cross counter flow operation possible - Transparent shell, visible tube bundle - Tube bundle consisting of at least 7 tubes and 4 baffle plates - Recording of temperature using Heat Exchanger Test Bench Technical data: Heat transfer surface of 200cm2 Tube bundle, stainless steel with outer diameter of 6mm and wall thickness of at least 1mm Shell, transparent (PMMA) with outer diameter of 50mm and wall thickness of at least 3mm "" Accessory 1: Universal Drive and Brake Unit

	Specification: - Drive and brake unit used for studying different driving or driven machines - Asynchronous motor with frequency converter allows 4-quadrant operation: generator or motor mode - Asynchronous motor with pendulum suspension, torque measurement via lever arm and force sensor - Optical sensor for recording the speed - Data exchange between base module and accessories through data cable - Measured values for speed and torque are digitally displayed on the device Technical data: Asynchronous motor with frequency converter - power: at least 2200W - maximum speed: approximately 3000 rpm - maximum torque: approximately 12Nm 'V-belt operation - length of V-belt: 1157mm, 1180mm, 1250mm - type of V-belt: SPA - diameter of V-belt pulley: 125mm Resistive load: 72Ω, 2400W Measuring ranges - torque: ±15Nm - speed: 0 to 5000 rpm Power requirement: 230V, 60Hz, 3 phases" "Accessory 2: Four-stroke Gasoline Engine Air-cooled overhead valve four-stroke petrol engine Specification: - Air-cooled single-cylinder four-stroke petrol engine for installation in the Engine Test Stand - Engine mounted on vibration-insulated base plate - Force transmission to brake via pulley - Engine complete with fuel hose and exhaust gas temperature sensor - Fuel hose with self-sealing quick-release coupling Technical data : Air-cooled single-cylinder petrol engine - power output: approximately 2.2kW at 3200 rpm - bore: 62mm - stroke: 42mm Belt pulley: Ø 125mm" "Accessory 3: Pressure transducer and TDC sensor for Four Stroke Gasoline Engine Modified spark plug with piezoelectric pressure sensor Specification: - Modified spark plug carrying the actual pressure transducer - Quartz pressure transducer Technical data: Pressure transducer - measuring range: 0 to 100bar - maximum operating temperature: at least 200°C - maximum allowable pressure: at least 250bar" Accessory 4: Four-stroke diesel engine Air-cooled four-stroke diesel engine with direct injection 'Specification: - Air-cooled single-cylinder four-stroke diesel engine for for installation in the Engine Test Stand - Engine mounted on vibration-insulated base plate

	- Force transmission to brake via pulley - Engine complete with fuel hose and exhaust gas temperature sensor - Fuel hose with self-sealing quick-release coupling Technical data : Air-cooled single-cylinder diesel engine - power output: approximately 3kW at 3000rpm - bore: 69mm - stroke: 62mm V-belt: Ø 125mm " "Accessory 5: Pressure transducer and TDC sensor for Four Stroke Diesel Engine Pressure measurement in the combustion chamber of an engine using a micro pressure transducer Specification: quartz pressure transducer Technical data: Pressure transducer - measuring range: 0 to 100bar - maximum operating temperature: at least 200°C - maximum allowable pressure: at least 250bar" "Accessory 6: Electronic engine indicating system Cylinder pressure indication system Specification: - Cylinder pressure indication system for internal combustion engine - Only to be used in conjunction with pressure transducers for both gasoline and diesel engines - Chronological representation of pressure curve against the crank angle in p-t diagram to determine the maximum pressure and to monitor the ignition point and the pressure increase - Representation of pressure curve against the standardised piston capacity in p-V diagram to determine the indicated power output - System consists of measuring amplifier and software - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data: Measuring amplifier - amplification factor: 10mbar/mV - TDC sensor trigger distance : - 1mm Power Requirement : 230V, 60Hz, 1 phase" "Accessory 7: Exhaust gas analysing unit Measurement of exhaust gas relevant parameters on internal combustion engines Specification : - Exhaust gas analysis unit for engines - Menu-based display for calibration, operation and displaying measured values - Temperature sensor for measurement of engine oil temperature - USB interface Technical data : Working temperature: 5 to 45°C Measuring ranges - CO: 0 to 10% vol. - CO2: 0 to 20% vol. - O2: 0 to 22% vol. - HC: 0 to 2500ppm vol. - lambda: 0 to 9,999

	- oil temperature: 0 to 130°C - accuracy classes 1 and 0 Power requirement : 230V, 60Hz, 1 phase" Warranty: One (1) year against factory defects and Two (2) years after-sales service and support Must include on-site training to TSU Faculty
3.	**Test Stand for Single-Cylinder Engines, 3kW** Specification : - Test stand for mounting of prepared single-cylinder engines (two-stroke and four-stroke) with a maximum power output of 3kW - Engine started by Universal Drive and Brake Unit - The Universal Drive and Brake Unit acting as a brake generates the engine load - Force transmission from engine to load unit via V-belt drive - Continuous adjustment of speed and torque using Universal Drive and Brake Unit - Vibration-dampened switch cabinet for display and control - Measuring tube with scale and pressure sensor for manual and electronic fuel consumption measurement Measurement and display of air consumption, ambient temperature and fuel temperature - Measured value displays for engine exhaust gas temperature - Stabilisation tank for intake air - 3 supply tanks for different fuels - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data : 3 fuel tanks: 5 liters each Measuring ranges : '- Temperature: -- 0 to 100°C (ambient) -- 0 to 100°C (fuel) -- 0 to 1000°C (exhaust gas) - Air consumption: 30 to 333L/min - Fuel consumption: 0 to 50cm3/min Power requirement: 230V, 60Hz, 1 phase
4.	**Deformation of Bars under Bending or Torsion** Influence of material, cross-section and clamping length on deformation 'Specification: - Elastic deformation of bars under bending or torsion - Bending tests with statically determinate and indeterminate systems - Supports in the bending test may be clamped or free - 2 adjustable blocks with clamping chuck for torsion tests and supports for bending tests - Weights to generate the bending or twisting moment - Dial gauge with bracket - Storage system to house the components Technical data : - 17 bars for bending tests -- material: aluminium, steel, brass, copper -- height with LxW 510x20mm: h=3 to 10mm -- width with LxH 510x5mm: w=10 to 30mm -- length with WxH 20x4mm: l=210 to 510mm -- LxWxH: 20x4x510mm (Aluminum, Steel, Brass, Copper) -- LxWxH: 10x10x510mm (aluminium) '- 22 torsion bars -- material: aluminium, steel, brass, copper -- length with Ø 10mm: 50 to 640mm (aluminium)

	-- ØxL: 10x50mm/10x340mm (aluminium, steel, copper, brass) -- diameter with L=50/340mm: Ø 5 to 12mm (steel) - Dial gauge : 0 to 10mm, graduation: 0.01mm Tape measure : graduation of 0.01m Weights : 1x 100g (hanger), 1x 100g, 1x 400g, 1X 500g, 1x 900g "
5.	**Fatigue Testing Machine** Fatigue strength of bars subject to cyclic bending load; stress-number (S-N) diagram Specification: - Basic principles of fatigue strength testing - Driven by electric motor - Automatically shuts down when the specimen fractures - Load application device with sliding movable support, threaded spindle with hand wheel, spring balance - Steel cylindrical specimens, various fillet radii - Speed measured by contactless inductive speed sensor or electronic counter for load cycles - Digital counter display - Protective cover for safe operation - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data - Electric motor: speed of approximately 2800rpm, 0.37kW - Load force: 0 to 300N - Electronic load counter: 8-digit and switchable to indicate speed Specimens: Steel Ck35, 3 different fillet radii R2 and R0.5 - bar diameter: Ø 8mm - bar total length: 146mm - quality of surface finish of the radii -- Rz4.0 - clamping pin: Ø 12x40mm Power Requirement: 230V, 60Hz, 1 phase Accessory: System for Data Acquisition Electronic data acquisition and evaluation of bending fatigue tests (fatigue strength test) Specification: - Data analysis for WP 140 - Recording, processing and saving of data for bar load and number of load cycles - Output of stress-number curves - Strain gauge force sensors - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data: Strain gauge force sensor mounted in full bridge with measuring range of 0 to 400N Measuring amplifier - 8x analogue in, 2x analogue out - 20x digital in/out 230V, 60Hz, 1 phase"
6.	**Radial Compressor Test Rig** Two-stage compressor: recording of the compressor curve for both stages Specification: - Functioning and operating behaviour of a radial compressor - Two-stage radial compressor with drive motor - Variable speed via frequency converter - Transparent intake and delivery pipes - Throttle valve for adjusting the air flow in the delivery pipe - Protecting plate at air inlet for undisturbed air flow - Determination of flow rate via intake nozzle

	- Display of differential pressures, flow rate, speed, electrical power consumption and hydraulic power output, temperatures and efficiency - Display and evaluation of the measured values as well as operation of the unit via software - Software with control functions and data acquisition via USB under Windows 7, 8.1, 10"
7.	**Comparison of Positive Displacement Pumps and Compressors Test Rig** Interchangeable driven machines: three pump types, two compressor types Specification: - Comparison of driven machines for liquid and gaseous media - Closed water circuit - 2 compressors: piston compressor and rotary vane compressor - 4 pumps: piston pump, impeller pump, 2 centrifugal pumps - Drive motor with variable speed - Flow determined by level (water) or Venturi tube (air) - Digital displays for pressure, differential pressure, temperature, speed and drive power - Software for data acquisition via USB under Windows 7, 8.1, 10"
8.	**Equipment for Fundamentals of Temperature Measurement** Specification: - Experiments in the fundamentals of temperature measurement with 7 typical measuring devices - Various heat sources or storage units: laboratory heater, immersion heater, vacuum flask - Calibration units: precision resistors and digital multimeter - Liquid, bimetallic and gas pressure thermometers - Temperature sensors: Pt100, thermocouple type K, thermistor (NTC) - Various temperature measuring strips - Psychrometer for humidity measurement"
9.	**Fundamentals of Pressure Measurement** Specification: - Basic experiments for measuring pressure with three different measuring instruments - U-tube and inclined tube manometer - One Bourdon tube pressure gauge each for positive and negative pressure - Plastic syringe generates test pressures in the millibar range - Calibration device with Bourdon tube pressure gauge for calibrating mechanical manometers Technical data : Inclined tube manometer : angle = 30° Measuring ranges : - pressure: -- 0 to ±60mbar (Bourdon tube pressure gauge) -- 0 to 500mmWC (U-tube manometer) -- 0 to500mmWC (inclined tube manometer)"
10.	**Radial Fan Test Rig** Operating behavior and characteristic variables of a radial fan; two interchangeable rotors Specification: - Functioning and operating behavior of a radial fan - Radial fan with 3-phase AC motor - Variable speed via frequency converter - Transparent intake and delivery pipes - Throttle valve to adjust the air flow in the delivery pipe - Interchangeable rotors: 1 rotor with forward curved blades and 1 rotor with backward curved blades - Determination of flow rate via intake nozzle

	- Display of differential pressure, flow rate, speed, electrical power consumption and hydraulic power output, temperature and efficiency - Display and evaluation of the measured values as well as operation of the unit via software - Software with control functions and data acquisition via USB under Windows 7, 8.1, 10"
11.	**Axial Fan Test Rig** Operating behaviour and characteristic variables of an axial fan Specification - Functioning and operating behaviour of an axial fan - Axial fan with electronically commutated drive motor - Variable speed via integrated controller - Transparent intake and delivery pipes - Throttle valve to adjust the air flow in the delivery pipe - Determination of flow rate via intake nozzle - Display of differential pressure, flow rate, speed, electrical power consumption and hydraulical power output, temperature and efficiency - Due to integrated microprocessor-based instrumentation no additional devices with error-prone wiring are required - Display and evaluation of the measured values as well as operation of the unit via software - Software with control functions and data acquisition via USB under Windows 7, 8.1, 10
12.	**Steam Power Plant** Technical Specifications Steam engine: • Maximum power: 5W • Maximum speed: 1200 per minute • Cylinder diameter: 20 mm Generator: • DC motor: max. 3,18W at 6000min-1 Gas-fired boiler • safety valve: 4bar • gas connection 3/8“L (propane or butane) Measuring ranges • Temperature: 8 x -20 to 200°C • Pressure: 0 to 6 bars • Flow rate: · 0 to 110 L/h (gas) · 15 to 105 L/h (water) • Voltage: 0 to 10 VDC • Current: 0 to 250mA Delivery: 120 days Warranty: One Year against factory defects, Two years on after-sales service
13.	**Equipment for Calibration of Pressure Gauges** Operation of a Bourdon tube pressure gauge and a piston manometer Specification: - Bourdon tube pressure gauge for pressure measurement - Transparent dial face with a view of the spring mechanism - Accurately fitting piston and cylinder of the piston manometer without seals - Hydraulic oil for transfer of the force - Hydraulic pump with storage tank and bleed mechanism Technical data: Piston manometer - pressure piston: diameter: at least 12mm

	- hydraulic cylinder: diameter: at least 25mm, length=225mm - oil : ISO viscosity grade: VG 32 Set of weights - weight holder: 385g / 0.334bar - 1x 193g / 0.166bar - 4x 578g / 0.5bar Measuring ranges - pressure: 0 to 2.5bar"
14.	**Apparatus, General Purpose Drying Oven** Capacity 220 Liters, Inside Dimensions 600x620x600 mm, Outside Dimensions 880x885x790 mm, 1 door, Wattage 2000, weight 60 kg.
15.	**Vortex Apparatus** Eqquiped with Transparent Vessel, Traverse Probe, Pitot tube, and Variable Speed.
16.	**Series and Parallel Pumps Test Rig** Demonstration of series, parallel and the individual operation of centrifugal pumps Learning Objectives / experiments: Operating behaviour of centrifugal pumps single pump series configuration parallel configuration recording of pump curves Determination of pump efficiencies recording of system characteristics Specification: Investigation and operating behaviour of pumps in various operating mode Single pump, series or parallel pump operation configurable via valves Closed water circuit contains centrifugal pumps with drive motor and a transparent water tunk One pump with variable speed and one pump with fixed speed Adjustment of flow resistence by a valve at outlet of the pump Sensors for pressure at inlet and outlet of the pump Display and evaluation of the measured values as well as operation of the unit via software Software with control functions and data acquisition via USB under Windows 7,8.1, 10

Note: Bidders must state in the Statement of Compliance 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 provision of **ITB** Clause 4.

Section VIII. Bid Documents Checklist

This Bid Documents Checklist is provided to guide the Bidder in preparing his/her bid. The checklist may be used by the Bidder to verify if the Bid includes all the prescribed documents.

The Bidder, in submitting the required documents, must use the prescribed forms found in Section X. Bidding Forms. However, should a bidder choose to use a different formatting style for a required document, the bidder must ensure that the substance in the form given in Section X for that particular document is substantially captured in the equivalent document.

I. TECHNICAL COMPONENT ENVELOPE

Class "A" Documents

Legal Documents

☐ (a) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages) in accordance with Section 8.5.2 of the IRR;

Technical Documents

☐ (b) Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid; and

☐ (c) Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided for in Sections 23.4.1.3 and 23.4.2.4 of the 2016 revised IRR of RA No. 9184, within the relevant period as provided in the Bidding Documents; and

☐ (d) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission or Original copy of Notarized Bid Securing Declaration; and

☐ (e) Conformity with the Technical Specifications, which may include production/delivery schedule, manpower requirements, and/or after-sales/parts, if applicable; and

☐ (f) Original duly signed Omnibus Sworn Statement (OSS) and if applicable, Original Notarized Secretary's Certificate in case of a corporation, partnership, or cooperative; or Original Special Power of Attorney of all members of the joint venture giving full power and authority to its officer to sign the OSS and do acts to represent the Bidder.

Financial Documents

☐ (g) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC) or A committed Line of Credit from a Universal or Commercial Bank in lieu of its NFCC computation.

Class "B" Documents

☐ (h) If applicable, a duly signed joint venture agreement (JVA) in case the joint venture is already in existence or duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.

II. FINANCIAL COMPONENT ENVELOPE

☐ (i) Original of duly signed and accomplished Financial Bid Form; and

☐ (j) Original of duly signed and accomplished Price Schedule(s).

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[*Bidder's Letterhead*]

[*Date*]

To: Tarlac State University
Re: Invitation to Bid No.

List of All Ongoing Government and Private Contracts, Including Contracts Awarded But Not Yet Started

Row 1: Name of Contract Row 2: Location of Project Row 3: Contract Price	Row 1: Procuring Entity Row 2: Contact Person/Address Row 3: Telephone No.	Description of Goods	Row 1: Date of Award Row 2: Date Started Row 3: Contract Duration	Value of Outstanding Goods

Attached herewith are the following documents: Notice of Award, Notice to Proceed, and Official Receipts/Invoices, as evidences in support of the foregoing information.

I/We certify that the foregoing information and all of the supporting documents are true and correct.

[*Signature*]
[*Name of Bidder or Authorized Representative*]
[*Position or Title*]

[*Bidder's Letterhead*]

[*Date*]

To: Tarlac State University
Re: Invitation to Bid No.

Statement of Single Largest Completed Contract Similar to the Contract to be Bid

Row 1: Name of Contract Row 2: Location	Contract Price	Row 1: Procuring Entity Row 2: Address Row 3: Contact Person/Tel. No.	Description of Goods	Date of Award	Date Completed

Attached herewith are the following documents: Contract Agreement, Notice of Award, Notice to Proceed, Official Receipt/Invoice, Certificate of Final Inspection, and Certificate of Acceptance, as evidences in support of the foregoing information.

I/We certify that the foregoing information and all of the supporting documents are true and correct.

[*Signature*]
[*Name of Bidder or Authorized Representative*]
[*Position or Title*

Bid-Securing Declaration

Republic of the Philippines
City/Municipality Of _____ **) S.S.**

x----------x

Invitation to Bid *[Insert reference number]*

To: **Tarlac State University**

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid-Securing Declaration.

2. I/We accept that: (a) I/we will be automatically disqualified from bidding for any contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of written demand by the procuring entity for the commission of acts resulting to the enforcement of the bid securing declaration under Sections 23.1(b), 34.2, 40.1 and 69.1, except 69.1 (f), of the IRR of RA 9184; without prejudice to other legal action the government may undertake.

3. I/We understand that this Bid-Securing Declaration shall cease to be valid on the following circumstances:

    a. Upon expiration of the bid validity period, or any extension thereof pursuant to your request;

    b. I am/we are declared ineligible or post-disqualified upon receipt of your notice to such effect, and

        i) I/we failed to timely file a request for reconsideration or

        ii) I/we filed a waiver to avail of said right;

    c. I am/we are declared as the bidder with the Lowest Calculated Responsive Bid, and I/we have furnished the performance security and signed the Contract.

IN WITNESS WHEREOF, I/We have hereunto set my/our hand/s this ____ day of *[month] [year]* at *[place of execution]*.

[*Signature*]
[*Name of Bidder's Authorized Representative*
[*Signatory's legal capacity*]
Affiant

SUBSCRIBED AND SWORN to before me this __ day of *[month] [year]* at *[place of execution]*, Philippines. Affiant/s is/are personally known to me and was/were identified by me through competent evidence of identity as defined in the 2004 Rules on Notarial Practice (A.M. No. 02-8-13-SC). Affiant/s exhibited to me his/her *[insert type of government identification card used]*, with his/her photograph and signature appearing thereon, with no. _____.

Witness my hand and seal this ___ day of *[month] [year]*.

[*Name and Signature of Notary Public*]

Serial No. of Commission _____

Notary Public for _____ until _____

Roll of Attorneys No. _____

PTR No. __, *[date issued], [place issued]*

IBP No. __, *[date issued], [place issued]*

Doc. No. ___

Page No. ___

Book No. ___

Series of ____.

[*Bidder's Letterhead*]

[*Date*]

To: Tarlac State University
Re: Invitation to Bid No.

Compliance to the Technical Specifications

Item No.	Description	**Bidder's Compliance** State "Comply" below *if your offer is complying with the specifications, otherwise state* "We are offering the same goods with the following specifications [*State the complete specifications of the alternative offer*]
Laboratory Equipment for CE & ME of the College of Engineering		
1.	**Multi-Function Data Acquisition Module For Power Engineering Trainer** A module combination of an isolated and differential oscilloscope, multimeter, wattmeter, energy analyzer and recorder designed for demonstration and laboratory experiments. Applications: Energy networks Voltage and frequency stability Load behaviour of networks Effect of harmonics Electrical machines Inrush current from transformers and machines Transformation ratio of transformers Efficiency of machines Power electronics Rectifier DC/DC converter DC/AC converter Frequency converter Filter DISPLAY & OPERATION Graphic display: 9 cm (3,5"), QVGA, colour, light (adjustable up to 400 cd/m²) Operation: Button and incremental encoder with button INPUTS & OUTPUTS Inputs: 4 isolated measurement channels CATIII 300, each with I and U measurement (max. 8 usable (max. 8 usable simultaneously) Input A-D: U and I connection via 4 mm safety sockets Measurement range U: 25/70/250/700 VAC ±36/±100/±360/±1000 VDC Measurement range I: 0.7/1.6/7/16 AAC ±1/±2.5/±10/±16 ADC Sampling rate: max. 1.000.000 values/s per channel for U, max. 500.000 values/s for I	

	GENERAL Data storage: integrated micro-SD card (4 GB) for more than a thousand measurement files and screenshots Remote access: full remote access and distribution of measurement data WLAN: as access point or client USB port: Type C Advanced Features: •Simultaneous measurement of U, I, φU, φI, f and P •Instantaneous values U, I and P •Averaged values U, I and P •RMS values (AC+DC) U and I •Fundamental wave filters •Delta connection adjustment •Measuring accuracy U,I is at 0,5%. •Frequency response voltage: 100 kHz 3 dB 250 V •Frequency response current: 40 kHz 3 dB at 10 A •Universal connection options via USB connection with PC or laptop or via WiFi with the school network or setting up an access point •Automatic or manual range selection •Electrical power calculation S, P, QC and QL •Electrical work WS, W and WQ •Resistance calculation R, Z, XC, XL, G, Y, BC and BL •Positive sequence component, negative sequence component and zero sequence component in 3-phase system •Time derivative, integral over time, FFT analysis, mean value, histogram, and modelling Advanced Features: •Possibility of direct manual operation of the device by means of a rotary selector with cursor keys direct value readings on 9 cm backlit display •Display of up to 24 measured values on one display •Display of all values for each channel •Display of all values in tabular form •Display of measured values in a diagram •Display of a vector diagram Delivery: 120 days Warranty: One (1) year against factory defects and Two (2) years after-sales service and support Must include on-site training to TSU Faculty	
2.	**Heat Exchanger Test Bench** Measuring the transfer characteristics of different heat exchanger models Specification - Supply unit for heat exchangers - Hot water circuit with tank, heater, temperature controller, pump, and protection against lack of water - Cold water circuit from laboratory water supply - Temperature controller controls the temperature of hot water - Flow adjustable using valves - Digital displays for 6 temperature and 2 flow rate sensors - Water connections with quick-release couplings - Stirring machine connection with speed adjustment - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data:	

	Pump: power consumption of at least 120W, max. flow rate of at least 600L/h and max. head of 30m Heater: power output of not more than 3kW, thermostat setting from 0 to70°C Hot water tank: approx. 10L Specification: - Shell and tube heat exchanger (cross-flow) for connection to Heat Exchanger Test Bench - Hot and cold-water supply from Heat Exchanger Test Bench - Cross parallel flow and cross counter flow operation possible - Transparent shell, visible tube bundle - Tube bundle consisting of at least 7 tubes and 4 baffle plates - Recording of temperature using Heat Exchanger Test Bench Technical data: Heat transfer surface of 200cm2 Tube bundle, stainless steel with outer diameter of 6mm and wall thickness of at least 1mm Shell, transparent (PMMA) with outer diameter of 50mm and wall thickness of at least 3mm "" Accessory 1: Universal Drive and Brake Unit Specification: - Drive and brake unit used for studying different driving or driven machines - Asynchronous motor with frequency converter allows 4-quadrant operation: generator or motor mode - Asynchronous motor with pendulum suspension, torque measurement via lever arm and force sensor - Optical sensor for recording the speed - Data exchange between base module and accessories through data cable - Measured values for speed and torque are digitally displayed on the device Technical data: Asynchronous motor with frequency converter - power: at least 2200W - maximum speed: approximately 3000 rpm - maximum torque: approximately 12Nm 'V-belt operation - length of V-belt: 1157mm, 1180mm, 1250mm - type of V-belt: SPA - diameter of V-belt pulley: 125mm Resistive load: 72Ω, 2400W Measuring ranges - torque: ±15Nm - speed: 0 to 5000 rpm Power requirement: 230V, 60Hz, 3 phases" "Accessory 2: Four-stroke Gasoline Engine Air-cooled overhead valve four-stroke petrol engine Specification: - Air-cooled single-cylinder four-stroke petrol engine for installation in the Engine Test Stand - Engine mounted on vibration-insulated base plate - Force transmission to brake via pulley - Engine complete with fuel hose and exhaust gas temperature sensor - Fuel hose with self-sealing quick-release coupling	

	Technical data : Air-cooled single-cylinder petrol engine - power output: approximately 2.2kW at 3200 rpm - bore: 62mm - stroke: 42mm Belt pulley: Ø 125mm" "Accessory 3: Pressure transducer and TDC sensor for Four Stroke Gasoline Engine Modified spark plug with piezoelectric pressure sensor Specification: - Modified spark plug carrying the actual pressure transducer - Quartz pressure transducer Technical data: Pressure transducer - measuring range: 0 to 100bar - maximum operating temperature: at least 200°C - maximum allowable pressure: at least 250bar" Accessory 4: Four-stroke diesel engine Air-cooled four-stroke diesel engine with direct injection 'Specification: - Air-cooled single-cylinder four-stroke diesel engine for for installation in the Engine Test Stand - Engine mounted on vibration-insulated base plate - Force transmission to brake via pulley - Engine complete with fuel hose and exhaust gas temperature sensor - Fuel hose with self-sealing quick-release coupling Technical data : Air-cooled single-cylinder diesel engine - power output: approximately 3kW at 3000rpm - bore: 69mm - stroke: 62mm V-belt: Ø 125mm " "Accessory 5: Pressure transducer and TDC sensor for Four Stroke Diesel Engine Pressure measurement in the combustion chamber of an engine using a micro pressure transducer Specification: quartz pressure transducer Technical data: Pressure transducer - measuring range: 0 to 100bar - maximum operating temperature: at least 200°C - maximum allowable pressure: at least 250bar" "Accessory 6: Electronic engine indicating system Cylinder pressure indication system Specification: - Cylinder pressure indication system for internal combustion engine - Only to be used in conjunction with pressure transducers for both gasoline and diesel engines - Chronological representation of pressure curve against the crank angle in p-t diagram to determine the	

	maximum pressure and to monitor the ignition point and the pressure increase - Representation of pressure curve against the standardised piston capacity in p-V diagram to determine the indicated power output - System consists of measuring amplifier and software - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data: Measuring amplifier - amplification factor: 10mbar/mV - TDC sensor trigger distance : - 1mm Power Requirement : 230V, 60Hz, 1 phase" "Accessory 7: Exhaust gas analysing unit Measurement of exhaust gas relevant parameters on internal combustion engines Specification : - Exhaust gas analysis unit for engines - Menu-based display for calibration, operation and displaying measured values - Temperature sensor for measurement of engine oil temperature - USB interface Technical data : Working temperature: 5 to 45°C Measuring ranges - CO: 0 to 10% vol. - CO2: 0 to 20% vol. - O2: 0 to 22% vol. - HC: 0 to 2500ppm vol. - lambda: 0 to 9,999 - oil temperature: 0 to 130°C - accuracy classes 1 and 0 Power requirement : 230V, 60Hz, 1 phase" Warranty: One (1) year against factory defects and Two (2) years after-sales service and support Must include on-site training to TSU Faculty	
3.	**Test Stand for Single-Cylinder Engines, 3kW** Specification : - Test stand for mounting of prepared single-cylinder engines (two-stroke and four-stroke) with a maximum power output of 3kW - Engine started by Universal Drive and Brake Unit - The Universal Drive and Brake Unit acting as a brake generates the engine load - Force transmission from engine to load unit via V-belt drive - Continuous adjustment of speed and torque using Universal Drive and Brake Unit - Vibration-dampened switch cabinet for display and control - Measuring tube with scale and pressure sensor for manual and electronic fuel consumption measurement Measurement and display of air consumption, ambient temperature and fuel temperature - Measured value displays for engine exhaust gas temperature - Stabilisation tank for intake air - 3 supply tanks for different fuels - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data : 3 fuel tanks: 5 liters each Measuring ranges : '- Temperature:	

	-- 0 to 100°C (ambient) -- 0 to 100°C (fuel) -- 0 to 1000°C (exhaust gas) - Air consumption: 30 to 333L/min - Fuel consumption: 0 to 50cm3/min Power requirement: 230V, 60Hz, 1 phase	
4.	**Deformation of Bars under Bending or Torsion** Influence of material, cross-section and clamping length on deformation 'Specification: - Elastic deformation of bars under bending or torsion - Bending tests with statically determinate and indeterminate systems - Supports in the bending test may be clamped or free - 2 adjustable blocks with clamping chuck for torsion tests and supports for bending tests - Weights to generate the bending or twisting moment - Dial gauge with bracket - Storage system to house the components Technical data : - 17 bars for bending tests -- material: aluminium, steel, brass, copper -- height with LxW 510x20mm: h=3 to 10mm -- width with LxH 510x5mm: w=10 to 30mm -- length with WxH 20x4mm: l=210 to 510mm -- LxWxH: 20x4x510mm (Aluminum, Steel, Brass, Copper) -- LxWxH: 10x10x510mm (aluminium) '- 22 torsion bars -- material: aluminium, steel, brass, copper -- length with Ø 10mm: 50 to 640mm (aluminium) -- ØxL: 10x50mm/10x340mm (aluminium, steel, copper, brass) -- diameter with L=50/340mm: Ø 5 to 12mm (steel) - Dial gauge : 0 to 10mm, graduation: 0.01mm Tape measure : graduation of 0.01m Weights : 1x 100g (hanger), 1x 100g, 1x 400g, 1X 500g, 1x 900g "	
5.	**Fatigue Testing Machine** Fatigue strength of bars subject to cyclic bending load; stress-number (S-N) diagram Specification: - Basic principles of fatigue strength testing - Driven by electric motor - Automatically shuts down when the specimen fractures - Load application device with sliding movable support, threaded spindle with hand wheel, spring balance - Steel cylindrical specimens, various fillet radii - Speed measured by contactless inductive speed sensor or electronic counter for load cycles - Digital counter display - Protective cover for safe operation - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data - Electric motor: speed of approximately 2800rpm, 0.37kW - Load force: 0 to 300N - Electronic load counter: 8-digit and switchable to indicate speed Specimens:	

	Steel Ck35, 3 different fillet radii R2 and R0.5 - bar diameter: Ø 8mm - bar total length: 146mm - quality of surface finish of the radii -- Rz4.0 - clamping pin: Ø 12x40mm Power Requirement: 230V, 60Hz, 1 phase Accessory: System for Data Acquisition Electronic data acquisition and evaluation of bending fatigue tests (fatigue strength test) Specification: - Data analysis for WP 140 - Recording, processing and saving of data for bar load and number of load cycles - Output of stress-number curves - Strain gauge force sensors - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data: Strain gauge force sensor mounted in full bridge with measuring range of 0 to 400N Measuring amplifier - 8x analogue in, 2x analogue out - 20x digital in/out 230V, 60Hz, 1 phase"	
6.	**Radial Compressor Test Rig** Two-stage compressor: recording of the compressor curve for both stages Specification: - Functioning and operating behaviour of a radial compressor - Two-stage radial compressor with drive motor - Variable speed via frequency converter - Transparent intake and delivery pipes - Throttle valve for adjusting the air flow in the delivery pipe - Protecting plate at air inlet for undisturbed air flow - Determination of flow rate via intake nozzle - Display of differential pressures, flow rate, speed, electrical power consumption and hydraulic power output, temperatures and efficiency - Display and evaluation of the measured values as well as operation of the unit via software - Software with control functions and data acquisition via USB under Windows 7, 8.1, 10"	
7.	**Comparison of Positive Displacement Pumps and Compressors Test Rig** Interchangeable driven machines: three pump types, two compressor types Specification: - Comparison of driven machines for liquid and gaseous media - Closed water circuit - 2 compressors: piston compressor and rotary vane compressor - 4 pumps: piston pump, impeller pump, 2 centrifugal pumps - Drive motor with variable speed - Flow determined by level (water) or Venturi tube (air) - Digital displays for pressure, differential pressure, temperature, speed and drive power - Software for data acquisition via USB under Windows 7, 8.1, 10"	

8.	**Equipment for Fundamentals of Temperature Measurement** Specification: - Experiments in the fundamentals of temperature measurement with 7 typical measuring devices - Various heat sources or storage units: laboratory heater, immersion heater, vacuum flask - Calibration units: precision resistors and digital multimeter - Liquid, bimetallic and gas pressure thermometers - Temperature sensors: Pt100, thermocouple type K, thermistor (NTC) - Various temperature measuring strips - Psychrometer for humidity measurement"	
9.	**Fundamentals of Pressure Measurement** Specification: - Basic experiments for measuring pressure with three different measuring instruments - U-tube and inclined tube manometer - One Bourdon tube pressure gauge each for positive and negative pressure - Plastic syringe generates test pressures in the millibar range - Calibration device with Bourdon tube pressure gauge for calibrating mechanical manometers Technical data : Inclined tube manometer : angle = 30° Measuring ranges : - pressure: -- 0 to ±60mbar (Bourdon tube pressure gauge) -- 0 to 500mmWC (U-tube manometer) -- 0 to500mmWC (inclined tube manometer)"	
10.	**Radial Fan Test Rig** Operating behavior and characteristic variables of a radial fan; two interchangeable rotors Specification: - Functioning and operating behavior of a radial fan - Radial fan with 3-phase AC motor - Variable speed via frequency converter - Transparent intake and delivery pipes - Throttle valve to adjust the air flow in the delivery pipe - Interchangeable rotors: 1 rotor with forward curved blades and 1 rotor with backward curved blades - Determination of flow rate via intake nozzle - Display of differential pressure, flow rate, speed, electrical power consumption and hydraulic power output, temperature and efficiency - Display and evaluation of the measured values as well as operation of the unit via software - Software with control functions and data acquisition via USB under Windows 7, 8.1, 10"	
11.	**Axial Fan Test Rig** Operating behaviour and characteristic variables of an axial fan Specification - Functioning and operating behaviour of an axial fan - Axial fan with electronically commutated drive motor - Variable speed via integrated controller - Transparent intake and delivery pipes - Throttle valve to adjust the air flow in the delivery pipe - Determination of flow rate via intake nozzle	

	- Display of differential pressure, flow rate, speed, electrical power consumption and hydraulical power output, temperature and efficiency - Due to integrated microprocessor-based instrumentation no additional devices with error-prone wiring are required - Display and evaluation of the measured values as well as operation of the unit via software - Software with control functions and data acquisition via USB under Windows 7, 8.1, 10	
12.	**Steam Power Plant** Technical Specifications Steam engine: • Maximum power: 5W • Maximum speed: 1200 per minute • Cylinder diameter: 20 mm Generator: • DC motor: max. 3,18W at 6000min-1 Gas-fired boiler • safety valve: 4bar • gas connection 3/8“L (propane or butane) Measuring ranges • Temperature: 8 x -20 to 200°C • Pressure: 0 to 6 bars • Flow rate: · 0 to 110 L/h (gas) · 15 to 105 L/h (water) • Voltage: 0 to 10 VDC • Current: 0 to 250mA Delivery: 120 days Warranty: One Year against factory defects, Two years on after-sales service	
13.	**Equipment for Calibration of Pressure Gauges** Operation of a Bourdon tube pressure gauge and a piston manometer Specification: - Bourdon tube pressure gauge for pressure measurement - Transparent dial face with a view of the spring mechanism - Accurately fitting piston and cylinder of the piston manometer without seals - Hydraulic oil for transfer of the force - Hydraulic pump with storage tank and bleed mechanism Technical data: Piston manometer - pressure piston: diameter: at least 12mm - hydraulic cylinder: diameter: at least 25mm, length=225mm - oil : ISO viscosity grade: VG 32 Set of weights - weight holder: 385g / 0.334bar - 1x 193g / 0.166bar - 4x 578g / 0.5bar Measuring ranges - pressure: 0 to 2.5bar"	
14.	**Apparatus, General Purpose Drying Oven** Capacity 220 Liters, Inside Dimensions 600x620x600 mm, Outside Dimensions 880x885x790 mm, 1 door, Wattage 2000, weight 60 kg.	

15.	**Vortex Apparatus** Eqquiped with Transparent Vessel, Traverse Probe, Pitot tube, and Variable Speed.	
16.	**Series and Parallel Pumps Test Rig** Demonstration of series, parallel and the individual operation of centrifugal pumps Learning Objectives / experiments: Operating behaviour of centrifugal pumps single pump series configuration parallel configuration recording of pump curves Determination of pump efficiencies recording of system characteristics Specification: Investigation and operating behaviour of pumps in various operating mode Single pump, series or parallel pump operation configurable via valves Closed water circuit contains centrifugal pumps with drive motor and a transparent water tunk One pump with variable speed and one pump with fixed speed Adjustment of flow resistence by a valve at outlet of the pump Sensors for pressure at inlet and outlet of the pump Display and evaluation of the measured values as well as operation of the unit via software Software with control functions and data acquisition via USB under Windows 7,8.1, 10	

Attached herewith are the manufacturer's product literature(s) and certification(s) that we are authorized to sell the goods.

We certify that the foregoing information and the supporting documents are true and correct.

[*Signature*]
[Name of Authorized Signatory]
[*Position/Title of Authorized Signatory*]

Omnibus Sworn Statement

REPUBLIC OF THE PHILIPPINES)
CITY/MUNICIPALITY OF _____) S.S.

AFFIDAVIT

I, [*Name of Affiant]*, of legal age, *[Civil Status]*, *[Nationality]*, and residing at *[Address of Affiant]*, after having been duly sworn in accordance with law, do hereby depose and state that:

1. ***Select one, delete the other:***

    b. *If a sole proprietorship:* I am the sole proprietor or authorized representative of *[Name of Bidder]* with office address at *[address of Bidder]*;

    c. *If a partnership, corporation, cooperative, or joint venture:* I am the duly authorized and designated representative of *[Name of Bidder]* with office address at *[address of Bidder]*;

2. ***Select one, delete the other:***

    a. If a sole proprietorship: As the owner and sole proprietor, or authorized representative of *[Name of Bidder]*, I have full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for *[Name of the Project]* of the *[Name of the Procuring Entity], as shown in the attached duly notarized Special Power of Attorney*;

    b. *If a partnership, corporation, cooperative, or joint venture:* I am granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for *[Name of the Project]* of the *[Name of the Procuring Entity],* as shown in the attached *[state title of attached document showing proof of authorization (e.g., duly notarized Secretary's Certificate, Board/Partnership Resolution, or Special Power of Attorney, whichever is applicable;)]*;

3. *[Name of Bidder]* is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, offices, corporations, or Local Government Units, foreign government/foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board, by itself or by relation, membership, association, affiliation, or controlling interest with another blacklisted person or entity as defined and provided for in the Uniform Guidelines on Blacklisting;

4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;

5. *[Name of Bidder]* is authorizing the Head of the Procuring Entity or its duly authorized representative(s) to verify all the documents submitted;

6. ***Select one, delete the rest:***

    a. *If a sole proprietorship:* The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

    b. *If a partnership or cooperative:* None of the officers and members of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of

the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

c. *If a corporation or joint venture:* None of the officers, directors, and controlling stockholders of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. *[Name of Bidder]* complies with existing labor laws and standards; and

8. *[Name of Bidder]* is aware of and has undertaken the following responsibilities as a Bidder:

   a. Carefully examine all of the Bidding Documents;
   b. Acknowledge all conditions, local or otherwise, affecting the implementation of the Contract;
   c. Made an estimate of the facilities available and needed for the contract to be bid, if any; and
   d. Inquire or secure Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*.

9. *[Name of Bidder]* did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.

10. In case advance payment was made or given, failure to perform or deliver any of obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to delivery certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.

IN WITNESS WHEREOF, I have hereunto set my hand this __ day of ___, 20__ at _____, Philippines.

_____
Bidder's Representative/Authorized Signatory

SUBSCRIBED AND SWORN to before me this ___ day of *[month] [year]* at *[place of execution]*, Philippines. Affiant/s is/are personally known to me and was/were identified by me through competent evidence of identity as defined in the 2004 Rules on Notarial Practice (A.M. No. 02-8-13-SC). Affiant/s exhibited to me his/her [insert type of government identification card used], with his/her photograph and signature appearing thereon, with no. _____ and his/her Community Tax Certificate No. _____ issued on ____ at _____.

Witness my hand and seal this ___ day of *[month] [year]*.

NAME OF NOTARY PUBLIC
Serial No. of Commission _____
Notary Public for _____ until _____
Roll of Attorneys No. _____
PTR No. _____ *[date issued], [place issued]*
IBP No. _____ *[date issued], [place issued]*

Doc. No. _____
Page No. _____
Book No. _____
Series of _____

[*Bidder's Letterhead*]

[*Date*]

To: Tarlac State University
Re: Invitation to Bid No.

NET FINANCIAL CONTRACTING CAPACITY

Based on our Income Tax Return and Audited Financial Statement for the Fiscal Year [*YEAR*], duly submitted to the Bureau of Internal Revenue, and which form part of our Bid, the summary of our firm's financial condition is as given below:

		Year [*YEAR*]
1.	Total Assets	
2.	Current Assets	
3.	Total Liabilities	
4.	Current Liabilities	
5.	Net Worth (1-3)	
6.	Net Working Capital (2-4)	

Based on the aforementioned data and the Value of Outstanding Works from the Statement of All Ongoing Government and Private Contracts, which also form part of our Bid, our Net Financial Contracting Capacity (NFCC) is:

> **NFCC** = *[(current asset minus current liabilities*) (**15**)] minus [*value of all outstanding or uncompleted portions of the projects under ongoing contracts including awarded contracts yet to be started coinciding with the contract to be bid*].
>
> **NFCC** =

I/We certify that the foregoing information and all of the supporting documents are true and correct.

[*Signature*]
[*Name of Bidder or Authorized Representative*]
[*Position or Title*]

[*Bidder's Letterhead*]

[*Date*]

FINANCIAL BID FORM

To: Tarlac State University
Re: Invitation to Bid No.

Having examined the Bidding Documents [*insert if any or delete, if none:* including Bid Bulletin Numbers *[insert numbers]*, the receipt of which is hereby duly acknowledged], we, the undersigned, offer to *[supply/deliver/perform] [description of the Goods]* in conformity with the said Bidding Documents for the sum of *[total Bid amount in words and figures]* or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this Bid.

If our Bid is accepted, we commit to deliver the goods in accordance with the delivery schedule specified in the Schedule of Requirements.

If our Bid is accepted, we undertake to provide a performance security in the form, amounts, and within the times specified in the Bidding Documents.

We agree to abide by this Bid for the Bid Validity Period specified in **ITB** Clause 14.2 and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

Until a formal Contract is prepared and executed, this Bid, together with your written acceptance thereof and your Notice of Award, shall be binding upon us.

We understand that you are not bound to accept the Lowest Calculated Bid or any Bid you may receive.

We certify/confirm that we comply with the eligibility requirements as per **ITB** Clause 5 of the Bidding Documents.

We likewise certify/confirm that the undersigned, *[for sole proprietorships, insert:* as the owner and sole proprietor or authorized representative of [*Bidder*], has the full power and authority to participate, submit the bid, and to sign and execute the ensuing contract, on the latter's behalf for the [*Name of Project*] of the Tarlac State University*] [for partnerships, corporations, cooperatives, or joint ventures, insert:* is granted full power and authority by the [*Bidder*], to participate, submit the bid, and to sign and execute the ensuing contract on the latter's behalf for [*Name of Project*] of the Tarlac State University.

We acknowledge that failure to sign each and every page of this Financial Bid Form, including the attached Schedule of Prices, shall be a ground for the rejection of our bid.

Dated this _____ day of _____ 20_____.

_____ _____

[signature] *[in the capacity of]*

Duly authorized to sign Bid for and on behalf of _____

[*Bidder's Letterhead*]

[*Date*]

To: Tarlac State University
Re: Invitation to Bid No.

SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
1.	**Multi-Function Data Acquisition Module For Power Engineering Trainer** A module combination of an isolated and differential oscilloscope, multimeter, wattmeter, energy analyzer and recorder designed for demonstration and laboratory experiments. Applications: Energy networks Voltage and frequency stability Load behaviour of networks Effect of harmonics Electrical machines Inrush current from transformers and machines Transformation ratio of transformers Efficiency of machines Power electronics Rectifier DC/DC converter DC/AC converter Frequency converter Filter DISPLAY & OPERATION Graphic display: 9 cm (3,5"), QVGA, colour, light (adjustable up to 400 cd/m²) Operation: Button and incremental encoder with button INPUTS & OUTPUTS Inputs: 4 isolated measurement channels CATIII 300, each with I and U measurement (max. 8 usable (max. 8 usable simultaneously) Input A-D: U and I connection via 4 mm safety sockets Measurement range U: 25/70/250/700 VAC ±36/±100/±360/±1000 VDC Measurement range I: 0.7/1.6/7/16 AAC ±1/±2.5/±10/±16 ADC Sampling rate: max. 1.000.000 values/s per channel for U, max. 500.000 values/s for I GENERAL Data storage: integrated micro-SD card (4 GB) for more than a thousand measurement files and screenshots	1	set		

	Remote access: full remote access and distribution of measurement data WLAN: as access point or client USB port: Type C Advanced Features: •Simultaneous measurement of U, I, φU, φI, f and P •Instantaneous values U, I and P •Averaged values U, I and P •RMS values (AC+DC) U and I •Fundamental wave filters •Delta connection adjustment •Measuring accuracy U,I is at 0,5%. •Frequency response voltage: 100 kHz 3 dB 250 V •Frequency response current: 40 kHz 3 dB at 10 A •Universal connection options via USB connection with PC or laptop or via WiFi with the school network or setting up an access point •Automatic or manual range selection •Electrical power calculation S, P, QC and QL •Electrical work WS, W and WQ •Resistance calculation R, Z, XC, XL, G, Y, BC and BL •Positive sequence component, negative sequence component and zero sequence component in 3-phase system •Time derivative, integral over time, FFT analysis, mean value, histogram, and modelling Advanced Features: •Possibility of direct manual operation of the device by means of a rotary selector with cursor keys direct value readings on 9 cm backlit display •Display of up to 24 measured values on one display •Display of all values for each channel •Display of all values in tabular form •Display of measured values in a diagram •Display of a vector diagram Delivery: 120 days Warranty: One (1) year against factory defects and Two (2) years after-sales service and support Must include on-site training to TSU Faculty				
			Total Bid Price for Item No.1		

[*Signature*]
[Name of Authorized Signatory]
[*Position/Title of Authorized Signatory*]

[*Bidder's Letterhead*]

[*Date*]

To: Tarlac State University
Re: Invitation to Bid No.

SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
2.	**Heat Exchanger Test Bench** Measuring the transfer characteristics of different heat exchanger models Specification - Supply unit for heat exchangers - Hot water circuit with tank, heater, temperature controller, pump, and protection against lack of water - Cold water circuit from laboratory water supply - Temperature controller controls the temperature of hot water - Flow adjustable using valves - Digital displays for 6 temperature and 2 flow rate sensors - Water connections with quick-release couplings - Stirring machine connection with speed adjustment - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data: Pump: power consumption of at least 120W, max. flow rate of at least 600L/h and max. head of 30m Heater: power output of not more than 3kW, thermostat setting from 0 to70°C Hot water tank: approx. 10L Specification: - Shell and tube heat exchanger (cross-flow) for connection to Heat Exchanger Test Bench - Hot and cold-water supply from Heat Exchanger Test Bench - Cross parallel flow and cross counter flow operation possible - Transparent shell, visible tube bundle - Tube bundle consisting of at least 7 tubes and 4 baffle plates - Recording of temperature using Heat Exchanger Test Bench Technical data: Heat transfer surface of 200cm2 Tube bundle, stainless steel with outer diameter of 6mm and wall thickness of at least 1mm Shell, transparent (PMMA) with outer diameter of 50mm and wall thickness of at least 3mm "" Accessory 1: Universal Drive and Brake Unit	1	set		

	Specification: - Drive and brake unit used for studying different driving or driven machines - Asynchronous motor with frequency converter allows 4-quadrant operation: generator or motor mode - Asynchronous motor with pendulum suspension, torque measurement via lever arm and force sensor - Optical sensor for recording the speed - Data exchange between base module and accessories through data cable - Measured values for speed and torque are digitally displayed on the device Technical data: Asynchronous motor with frequency converter - power: at least 2200W - maximum speed: approximately 3000 rpm - maximum torque: approximately 12Nm 'V-belt operation - length of V-belt: 1157mm, 1180mm, 1250mm - type of V-belt: SPA - diameter of V-belt pulley: 125mm Resistive load: 72Ω, 2400W Measuring ranges - torque: ±15Nm - speed: 0 to 5000 rpm Power requirement: 230V, 60Hz, 3 phases" "Accessory 2: Four-stroke Gasoline Engine Air-cooled overhead valve four-stroke petrol engine Specification: - Air-cooled single-cylinder four-stroke petrol engine for installation in the Engine Test Stand - Engine mounted on vibration-insulated base plate - Force transmission to brake via pulley - Engine complete with fuel hose and exhaust gas temperature sensor - Fuel hose with self-sealing quick-release coupling Technical data : Air-cooled single-cylinder petrol engine - power output: approximately 2.2kW at 3200 rpm - bore: 62mm - stroke: 42mm Belt pulley: Ø 125mm" "Accessory 3: Pressure transducer and TDC sensor for Four Stroke Gasoline Engine Modified spark plug with piezoelectric pressure sensor Specification: - Modified spark plug carrying the actual pressure transducer				

	- Quartz pressure transducer Technical data: Pressure transducer - measuring range: 0 to 100bar - maximum operating temperature: at least 200°C - maximum allowable pressure: at least 250bar" Accessory 4: Four-stroke diesel engine Air-cooled four-stroke diesel engine with direct injection 'Specification: - Air-cooled single-cylinder four-stroke diesel engine for for installation in the Engine Test Stand - Engine mounted on vibration-insulated base plate - Force transmission to brake via pulley - Engine complete with fuel hose and exhaust gas temperature sensor - Fuel hose with self-sealing quick-release coupling Technical data : Air-cooled single-cylinder diesel engine - power output: approximately 3kW at 3000rpm - bore: 69mm - stroke: 62mm V-belt: Ø 125mm " "Accessory 5: Pressure transducer and TDC sensor for Four Stroke Diesel Engine Pressure measurement in the combustion chamber of an engine using a micro pressure transducer Specification: quartz pressure transducer Technical data: Pressure transducer - measuring range: 0 to 100bar - maximum operating temperature: at least 200°C - maximum allowable pressure: at least 250bar" "Accessory 6: Electronic engine indicating system Cylinder pressure indication system Specification: - Cylinder pressure indication system for internal combustion engine - Only to be used in conjunction with pressure transducers for both gasoline and diesel engines - Chronological representation of pressure curve against the crank angle in p-t diagram to determine the maximum pressure and to monitor the ignition point and the pressure increase - Representation of pressure curve against the standardised piston capacity in p-V diagram to determine the indicated power output				

	- System consists of measuring amplifier and software - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data: Measuring amplifier - amplification factor: 10mbar/mV - TDC sensor trigger distance : - 1mm Power Requirement : 230V, 60Hz, 1 phase" "Accessory 7: Exhaust gas analysing unit Measurement of exhaust gas relevant parameters on internal combustion engines Specification : - Exhaust gas analysis unit for engines - Menu-based display for calibration, operation and displaying measured values - Temperature sensor for measurement of engine oil temperature - USB interface Technical data : Working temperature: 5 to 45°C Measuring ranges - CO: 0 to 10% vol. - CO2: 0 to 20% vol. - O2: 0 to 22% vol. - HC: 0 to 2500ppm vol. - lambda: 0 to 9,999 - oil temperature: 0 to 130°C - accuracy classes 1 and 0 Power requirement : 230V, 60Hz, 1 phase" Warranty: One (1) year against factory defects and Two (2) years after-sales service and support Must include on-site training to TSU Faculty				
Total Bid Price for Item No.2					

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SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
3.	**Test Stand for Single-Cylinder Engines, 3kW** Specification : - Test stand for mounting of prepared single-cylinder engines (two-stroke and four-stroke) with a maximum power output of 3kW - Engine started by Universal Drive and Brake Unit - The Universal Drive and Brake Unit acting as a brake generates the engine load - Force transmission from engine to load unit via V-belt drive - Continuous adjustment of speed and torque using Universal Drive and Brake Unit - Vibration-dampened switch cabinet for display and control - Measuring tube with scale and pressure sensor for manual and electronic fuel consumption measurement Measurement and display of air consumption, ambient temperature and fuel temperature - Measured value displays for engine exhaust gas temperature - Stabilisation tank for intake air - 3 supply tanks for different fuels - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data : 3 fuel tanks: 5 liters each Measuring ranges : '- Temperature: -- 0 to 100°C (ambient) -- 0 to 100°C (fuel) -- 0 to 1000°C (exhaust gas) - Air consumption: 30 to 333L/min - Fuel consumption: 0 to 50cm3/min Power requirement: 230V, 60Hz, 1 phase	1	set		
	Total Bid Price for Item No.3				

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SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
4.	**Deformation of Bars under Bending or Torsion** Influence of material, cross-section and clamping length on deformation 'Specification: - Elastic deformation of bars under bending or torsion - Bending tests with statically determinate and indeterminate systems - Supports in the bending test may be clamped or free - 2 adjustable blocks with clamping chuck for torsion tests and supports for bending tests - Weights to generate the bending or twisting moment - Dial gauge with bracket - Storage system to house the components Technical data : - 17 bars for bending tests -- material: aluminium, steel, brass, copper -- height with LxW 510x20mm: h=3 to 10mm -- width with LxH 510x5mm: w=10 to 30mm -- length with WxH 20x4mm: l=210 to 510mm -- LxWxH: 20x4x510mm (Aluminum, Steel, Brass, Copper) -- LxWxH: 10x10x510mm (aluminium) '- 22 torsion bars -- material: aluminium, steel, brass, copper -- length with Ø 10mm: 50 to 640mm (aluminium) -- ØxL: 10x50mm/10x340mm (aluminium, steel, copper, brass) -- diameter with L=50/340mm: Ø 5 to 12mm (steel) - Dial gauge : 0 to 10mm, graduation: 0.01mm Tape measure : graduation of 0.01m Weights : 1x 100g (hanger), 1x 100g, 1x 400g, 1X 500g, 1x 900g "	1	set		
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SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
5.	**Fatigue Testing Machine** Fatigue strength of bars subject to cyclic bending load; stress-number (S-N) diagram Specification: - Basic principles of fatigue strength testing - Driven by electric motor - Automatically shuts down when the specimen fractures - Load application device with sliding movable support, threaded spindle with hand wheel, spring balance - Steel cylindrical specimens, various fillet radii - Speed measured by contactless inductive speed sensor or electronic counter for load cycles - Digital counter display - Protective cover for safe operation - Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data - Electric motor: speed of approximately 2800rpm, 0.37kW - Load force: 0 to 300N - Electronic load counter: 8-digit and switchable to indicate speed Specimens: Steel Ck35, 3 different fillet radii R2 and R0.5 - bar diameter: Ø 8mm - bar total length: 146mm - quality of surface finish of the radii -- Rz4.0 - clamping pin: Ø 12x40mm Power Requirement: 230V, 60Hz, 1 phase Accessory: System for Data Acquisition Electronic data acquisition and evaluation of bending fatigue tests (fatigue strength test) Specification: - Data analysis for WP 140 - Recording, processing and saving of data for bar load and number of load cycles - Output of stress-number curves - Strain gauge force sensors	1	set		

	- Software for data acquisition via USB under Windows 7, 8.1, 10 Technical data: Strain gauge force sensor mounted in full bridge with measuring range of 0 to 400N Measuring amplifier - 8x analogue in, 2x analogue out - 20x digital in/out 230V, 60Hz, 1 phase"				
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SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
6.	**Radial Compressor Test Rig** Two-stage compressor: recording of the compressor curve for both stages Specification: - Functioning and operating behaviour of a radial compressor - Two-stage radial compressor with drive motor - Variable speed via frequency converter - Transparent intake and delivery pipes - Throttle valve for adjusting the air flow in the delivery pipe - Protecting plate at air inlet for undisturbed air flow - Determination of flow rate via intake nozzle - Display of differential pressures, flow rate, speed, electrical power consumption and hydraulic power output, temperatures and efficiency - Display and evaluation of the measured values as well as operation of the unit via software - Software with control functions and data acquisition via USB under Windows 7, 8.1, 10"	1	set		
Total Bid Price for Item No.6					

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SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
7.	**Comparison of Positive Displacement Pumps and Compressors Test Rig** Interchangeable driven machines: three pump types, two compressor types Specification: - Comparison of driven machines for liquid and gaseous media - Closed water circuit - 2 compressors: piston compressor and rotary vane compressor - 4 pumps: piston pump, impeller pump, 2 centrifugal pumps - Drive motor with variable speed - Flow determined by level (water) or Venturi tube (air) - Digital displays for pressure, differential pressure, temperature, speed and drive power - Software for data acquisition via USB under Windows 7, 8.1, 10"	1	set		
Total Bid Price for Item No.7					

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SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
8.	**Equipment for Fundamentals of Temperature Measurement** Specification: - Experiments in the fundamentals of temperature measurement with 7 typical measuring devices - Various heat sources or storage units: laboratory heater, immersion heater, vacuum flask - Calibration units: precision resistors and digital multimeter - Liquid, bimetallic and gas pressure thermometers - Temperature sensors: Pt100, thermocouple type K, thermistor (NTC) - Various temperature measuring strips - Psychrometer for humidity measurement"	1	set		
Total Bid Price for Item No.8					

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SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
9.	**Fundamentals of Pressure Measurement** Specification: - Basic experiments for measuring pressure with three different measuring instruments - U-tube and inclined tube manometer - One Bourdon tube pressure gauge each for positive and negative pressure - Plastic syringe generates test pressures in the millibar range - Calibration device with Bourdon tube pressure gauge for calibrating mechanical manometers Technical data : Inclined tube manometer : angle = 30° Measuring ranges : - pressure: -- 0 to ±60mbar (Bourdon tube pressure gauge) -- 0 to 500mmWC (U-tube manometer) -- 0 to500mmWC (inclined tube manometer)"	1	set		
Total Bid Price for Item No.9					

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SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
10.	**Radial Fan Test Rig** Operating behavior and characteristic variables of a radial fan; two interchangeable rotors Specification: - Functioning and operating behavior of a radial fan - Radial fan with 3-phase AC motor - Variable speed via frequency converter - Transparent intake and delivery pipes - Throttle valve to adjust the air flow in the delivery pipe - Interchangeable rotors: 1 rotor with forward curved blades and 1 rotor with backward curved blades - Determination of flow rate via intake nozzle - Display of differential pressure, flow rate, speed, electrical power consumption and hydraulic power output, temperature and efficiency - Display and evaluation of the measured values as well as operation of the unit via software - Software with control functions and data acquisition via USB under Windows 7, 8.1, 10"	1	set		
Total Bid Price for Item No.10					

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SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
11.	**Axial Fan Test Rig** Operating behaviour and characteristic variables of an axial fan Specification - Functioning and operating behaviour of an axial fan - Axial fan with electronically commutated drive motor - Variable speed via integrated controller - Transparent intake and delivery pipes - Throttle valve to adjust the air flow in the delivery pipe - Determination of flow rate via intake nozzle - Display of differential pressure, flow rate, speed, electrical power consumption and hydraulical power output, temperature and efficiency - Due to integrated microprocessor-based instrumentation no additional devices with error-prone wiring are required - Display and evaluation of the measured values as well as operation of the unit via software - Software with control functions and data acquisition via USB under Windows 7, 8.1, 10	1	set		
Total Bid Price for Item No.11					

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SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
12.	**Steam Power Plant** Technical Specifications Steam engine: • Maximum power: 5W • Maximum speed: 1200 per minute • Cylinder diameter: 20 mm Generator: • DC motor: max. 3,18W at 6000min-1 Gas-fired boiler • safety valve: 4bar • gas connection 3/8"L (propane or butane) Measuring ranges • Temperature: 8 x -20 to 200°C • Pressure: 0 to 6 bars • Flow rate: · 0 to 110 L/h (gas) · 15 to 105 L/h (water) • Voltage: 0 to 10 VDC • Current: 0 to 250mA Delivery: 120 days Warranty: One Year against factory defects, Two years on after-sales service	1	set		
Total Bid Price for Item No.12					

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SCHEDULE OF PRICES

Item No.	Description	Qty.	Unit	Unit Price	Total Price
13.	**Equipment for Calibration of Pressure Gauges** Operation of a Bourdon tube pressure gauge and a piston manometer Specification: - Bourdon tube pressure gauge for pressure measurement - Transparent dial face with a view of the spring mechanism - Accurately fitting piston and cylinder of the piston manometer without seals - Hydraulic oil for transfer of the force - Hydraulic pump with storage tank and bleed mechanism Technical data: Piston manometer - pressure piston: diameter: at least 12mm - hydraulic cylinder: diameter: at least 25mm, length=225mm - oil : ISO viscosity grade: VG 32 Set of weights - weight holder: 385g / 0.334bar - 1x 193g / 0.166bar - 4x 578g / 0.5bar Measuring ranges - pressure: 0 to 2.5bar"	1	set		
Total Bid Price for Item No.13					

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Item No.	Description	Qty.	Unit	Unit Price	Total Price
14.	**Apparatus, General Purpose Drying Oven** Capacity 220 Liters, Inside Dimensions 600x620x600 mm, Outside Dimensions 880x885x790 mm, 1 door, Wattage 2000, weight 60 kg.	2	set		
			Total Bid Price for Item No.14		

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Item No.	Description	Qty.	Unit	Unit Price	Total Price
15.	**Vortex Apparatus** Eqquiped with Transparent Vessel, Traverse Probe, Pitot tube, and Variable Speed.	3	set		
			Total Bid Price for Item No.15		

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Item No.	Description	Qty.	Unit	Unit Price	Total Price
16.	**Series and Parallel Pumps Test Rig** Demonstration of series, parallel and the individual operation of centrifugal pumps Learning Objectives / experiments: Operating behaviour of centrifugal pumps single pump series configuration parallel configuration recording of pump curves Determination of pump efficiencies recording of system characteristics Specification: Investigation and operating behaviour of pumps in various operating mode Single pump, series or parallel pump operation configurable via valves Closed water circuit contains centrifugal pumps with drive motor and a transparent water tunk One pump with variable speed and one pump with fixed speed Adjustment of flow resistence by a valve at outlet of the pump Sensors for pressure at inlet and outlet of the pump Display and evaluation of the measured values as well as operation of the unit via software Software with control functions and data acquisition via USB under Windows 7,8.1, 10	1	set		
	Total Bid Price for Item No.16				

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