



राष्ट्रीय प्रौद्योगिकी संस्थान मेघालय
NATIONAL INSTITUTE OF TECHNOLOGY MEGHALAYA
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Ref: NITMGH/ES/NIQ/R&M/2019-20/2126

Date: 05.02.2020

NOTICE INVITING QUOTATION (NIQ) FOR SUPPLY & INSTALLATION OF SMART FACTORY AUTOMATION FOR CENTRE FOR ROBOTICS & MECHATRONICS LABORATORY, NIT MEGHALAYA

NIT Meghalaya invites sealed tenders in a two bid system for supply and installation of equipment **as per details at ANNEXURE-III**. The first part is the **Technical Bid** which consists of technical requirements and general terms & conditions and the second part is the **Financial Bid**.

Prescribed Tender document, detailed fees and specifications, bid instructions and Terms & Conditions can be downloaded from the Institute website and should reach the undersigned on or before **1:00 PM on 28.02.2020**.

BID INSTRUCTIONS:

01. For submitting **Technical and Financial bid**, two separate sealed covers should be used with superscription clearly on the top of the Envelope. If two separate sealed covers are not used, the tender shall be cancelled as not conforming to the technical requirement. Both the sealed covers should be placed in the main sealed Envelope distinctly superscribed with the address of the Agency submitting the quotation and the Officer to whom the quotation is addressed to. Further, on the sealed cover, the following are to be written:

NOTICE INVITING QUOTATION (NIQ) FOR SUPPLY & INSTALLATION OF SMART FACTORY AUTOMATION FOR CENTRE FOR ROBOTICS & MECHATRONICS LABORATORY, NIT MEGHALAYA

Ref: NITMGH/ES/NIQ/R&M/2019-20/2126

Date: 05.02.2020

LAST DATE OF SUBMISSION:- **1:00 PM on 28.02.2020**. Technical bids will be opened on the same day at 3:30 p.m.

After evaluation of technical bids, financial bids of the successful bidders (technically qualified) will be opened on a later date which will be duly notified.

02. **Submission of Compliance Certificate:** Duly filled and signed Compliance Certificates (as per formats at Annexure-I A & B) are must with the Technical bid.
03. **Bid not transferable:** The bid documents are not transferable and the seal and signature of the authorized official of the firms must appear on all the papers and envelopes submitted.
04. The quantity mentioned for each item in the Annexure-III may increased/decreased depending on requirements.
05. GST Registration Certificate should be enclosed along with the tender documents.
06. Relevant catalogue of the items (if any) must be enclosed.
07. **Interested vendors may interact with Dr. Rabindra Narayan Mahapatra, Associate Professor & HoD, ME Department, NIT Meghalaya, for any queries.**
08. For e-waybill the successful vendor has to apply online via **<https://ewaybill.nic.in/ewb.html>**.
09. Softcopy of the Technical bid either in Microsoft Word or Microsoft Excel format must also be submitted in a CD along with the Technical Bid, in addition to the hard copies.

SIGNATURE OF BIDDER

NIQ TERMS & CONDITIONS:

01. **Rates:** Rates quoted in the Price Bid should be on DOOR DELIVERY NIT Meghalaya basis, as per details below:

Group:	Item Sl. No.	Item name	
Sl. No.	Particulars		Rate
I	Basic Price (per unit)		
	Discount if any		
	Total		
	GST (pl. break up CGST/SGST/IGST)		
	Total (per unit)		
	Grand total for the item		
II	Transportation charge up to NIT Meghalaya premises (if applicable)		
III	Transit Insurance covering all risk up to 10 days after delivery (if applicable)		
	Grand total on door delivery at NIT Meghalaya		
IV	Annual Maintenance Contract rate (after expiry of warranty period) for 1 st year/2 nd year/3 rd year		
V	Rate for dismantling, shifting/transporting, reassembling & re-installing at NIT Permanent Campus at Sohra (Cherrapunjee) from old campus Rates provided		

Note: Vague terms like “packing, forwarding, transportation etc. extra” without mentioning the specific amount will not be accepted. Such offers shall be treated as incomplete and rejected. Bidders shall indicate their rates in clear/visible figures as well as in words and shall not alter/overwrite/make cutting in the quotation. In case of a mismatch, the rates written in words will prevail. Usage of “White ink” to erase and then rewrite the rates will not be accepted. Bidders are advised to strike out wrong entries and rewrite clearly beside them. In such cases, the bidder shall have to sign and place their official seal for every corrected entry.

02. Quotations have to be submitted in Indian Rupees only. If goods are to be imported, the quotations shall include all charges for customs clearance, clearing agent fees, landing port handling charges, insurance etc. and onward transportation of the goods from the port/airport of landing for door delivery upto NIT Meghalaya, Shillong, Meghalaya.

NIT Meghalaya has a valid registration with the Department of Scientific and Industrial Research (DSIR), Ministry of Science & Technology, Government of India for availing Customs/Central Excise Duty exemption. NIT Meghalaya will provide all necessary certificates, authorizations and documents required for clearing the consignment and for onward transportation upto Shillong.

03. All documents submitted should be self-attested with seal of the bidder.
04. Bidder must unconditionally accept all terms and conditions stipulated in the tender document and all pages of the bid including all enclosures should be numbered and must be duly filled in, signed and stamped by the bidder or his authorized representative. Offers received without signature and seal on all pages are liable to be rejected.
05. **Validity of Quotation:** *Quoted rates must be valid for 120 days from the date of quotation.*
06. **Warranty:** The quoted equipment and components must be warranted for a minimum of one Year from the date of successful installation and training.
07. **Literature must:** All the quotations must be supported by the printed technical data sheet/ literature and the specifications mentioned in the quotation must be reflected/ supported by such printed technical data sheet/ literature. The model no. and specifications quoted should invariably be highlighted in the data sheets/ literature for easy reference.

SIGNATURE OF BIDDER

08. **Details of supply** of similar items to Institutes of National Importance (preferably those located in the Northeastern region) must be provided.
09. Vendors must also quote the total cost for shifting the equipment to NIT Permanent Campus, Sohra, i.e the total cost for dismantling from NIT Meghalaya, Shillong , transporting to NIT Permanent Campus, Sohra, re-assembling & re-installation to the functional level at the permanent campus, Sohra (Cherrapunjee) to the satisfaction of the concerned NIT Meghalaya officials.
10. **Presentation:** Technically qualified bidders may be called upon to give full presentation of the quoted equipment at NIT Meghalaya campus before opening of Price bid as a support of their Technical Quotations and for any clarifications.
11. **Equipment breakdown:** Any Equipment breakdown must be attended to within 72 hours during the warranty period of the equipment free of cost.
12. **Training:** If required, free training is to be provided to NIT Meghalaya personnel on the operation, installation, training, maintenance and trouble shooting of the supplied items.
13. **After Sales Service:** Vendor should clearly state the available nearest after sales service facilities in the North Eastern region, without which the offer will be rejected.
14. **Dealership Certificate:** The bidder/tenderer should be either a manufacturer or authorized agent of the foreign/Indian manufacturer. Dealers or Agents quoting on behalf of Manufacturer must enclose valid dealership certificate.
15. **Earnest Money:** Refundable Earnest Money Deposit (EMD) of ₹ 3,00,000/- (**Rupees Three Lakh**) only through demand draft drawn in favour of National Institute of Technology Meghalaya, payable at Shillong, will have to accompany the technical Bid.

The EMD of unsuccessful bidders shall be returned without any interest after award of contract. EMD of the successful bidder will be released without interest on submission of the Performance Bank Guarantee or delivery of the ordered items, as applicable.

In case of firms registered under NSIC, EMD exemption will be given to the permissible extent, as indicated in their Certificate. All vendors claiming exemption must submit copies of their valid NSIC registration Certificate duly attested with seal of the organization (along with the Technical Bid in case of two bid system). Offers received without Earnest Money or valid Certificate shall be summarily rejected.

16. **Performance Bank Guarantee (PBG):** The successful bidder shall furnish an unconditional PBG (as per format at Annexure II) for 10 % of the Purchase Order value from a Nationalized/Scheduled Bank of India, before release of the payment. Else 10 % of the billed amount will be deducted as security deposit. Where the PBG is obtained by a foreign bank, it shall be endorsed by a Nationalized/Scheduled Indian bank and shall be governed by Indian Laws and be subject to the jurisdiction of courts at Shillong. The PBG shall guarantee that,

- a) The Vendor guarantees satisfactory operation of the Equipment & components against poor workmanship, bad quality of materials used, faulty designs and poor performance.
- b) The Vendor shall, at his own cost, rectify the defects/replace the items supplied, for defects identified during the period of guarantee/warranty.

The PBG shall remain valid for period of sixty days beyond the date of completion of all contractual obligations of the supplier including warranty obligations.

17. Delivery:

- a. Time Limit: *Maximum within 90 (Ninety) days from the date of issue of purchase order.*
- b. Safe Delivery: All aspects of safe delivery shall be the exclusive responsibility of the vendor. At the destination site, the package will be opened only in the presence of NIT user/representative and vendor's representative. The intact condition of the package and the seal/indicators for not being tampered with, shall form the basis for certifying the receipt in good condition.

- c. **Insurance:** The supplier is to establish 'All Risk Transit Insurance' coverage till door delivery at NIT Meghalaya.
 - d. **Part Delivery:** As far as possible no part delivery shall be entertained. However, in extreme cases, acceptance of part delivery shall be a prerogative of the Institute.
 - e. **Penalty for delay in delivery:** The date of delivery should be strictly adhered to otherwise the Director, NIT Meghalaya reserves the right not to accept delivery in part or full. The Director, NIT Meghalaya also reserves the right to impose penalty, as deemed fit, for delay in delivery of the equipments including imposition of Liquidated Damages (LD). The decision of the Director shall be final and binding to all.
18. **Genuine Pricing:** Vendor is to ensure that quoted price for the particular item is not more than the price quoted to any other customer in India, particularly to IITs/NITs and other Government Organization. Copy of the latest price list for the quoted item, applicable in India, must be enclosed with the offer.
 19. **Conditional tenders not acceptable:** All the terms and conditions mentioned herein must be strictly adhered to by all the vendors. Conditional tenders shall not be accepted on any ground and shall be rejected straightway. Conditions mentioned in the tender bids submitted by vendors will not be binding on NIT Meghalaya.
 20. **Late and delayed tender:** Late and delayed tender will not be considered. In case any unscheduled holiday occurs on the prescribed closing/opening date the next working day shall be the prescribed date of closing/opening.
 21. **Payment:** 100% payment within 30 (thirty) days from date of delivery, installation, training and acceptance.
 22. **Enquiry during the course of evaluation not allowed:** After opening the Technical Bid, no enquiry from the bidder(s) shall be entertained during the course of evaluation of the tender till final decision is conveyed to the successful bidder(s). However, the Purchase Committee or its authorized representative may make enquiries/seek clarification from the bidders. In such a case, the bidder must extend full cooperation. The bidders may also be asked to arrange demonstration of the offered items, in a short period of notice.
 23. At any time prior to the date of submission of bid, NIT Meghalaya may, for any reason, either of its own or in response to a clarification from a prospective bidder, modify the bidding documents by an amendment / corrigendum. **Any such amendment / corrigendum will be duly notified through the Institute's website only.** Prospective bidders are advised to check the Institute's website every now and then for any amendment / corrigendum. In order to provide reasonable time to take the amendment into account in preparing the bid, NIT Meghalaya may extend the date and time for submission of bids.
 24. The acceptance of the quotation will rest solely with the Director, NIT Meghalaya, who in the interest of the Institute is not bound to accept the lowest quotation and reserves the right to himself to reject or partially accept any or all the quotations received without assigning any reasons.
 25. **Force Majeure:**

If the performance of the obligation of either party is rendered commercially impossible by any of the events hereafter mentioned that party shall be under no obligation to perform the agreement under order after giving notice of 15 days from the date of such an event in writing to the other party, and the events referred to are as follows:

 - (a) Any law, statute or ordinance, order action or regulations of the Government of India,
 - (b) Any kind of natural disaster, and
 - (c) Strikes, acts of the Public enemy, war, insurrections, riots, lockouts, sabotage.
 26. **Termination for default:** Default is said to have occurred

- (a) If the equipment or any of its component is found having poor workmanship, faulty designs, poor performance and bad quality of materials used.
- (b) If the supplier fails to deliver any or all of the services within the time period(s) specified in the purchase order or any extension thereof granted by NIT Meghalaya.
- (c) If the supplier fails to perform any other obligation(s) under the contract.

Under the above circumstances NIT Meghalaya may terminate the contract / purchase order in whole or in part and forfeit the EMD/PBG as applicable. In addition to above, NIT Meghalaya may at its discretion also take the following actions: NIT Meghalaya may procure, upon such terms and in such manner, as it deems appropriate, goods similar to the undelivered items/products and the defaulting supplier shall be liable to compensate NIT Meghalaya for any extra expenditure involved towards goods and services obtained.

26. **Applicable Law:**

- (a) The contract shall be governed by the laws and procedures established by Govt. of India and subject to exclusive jurisdiction of Competent Court and Forum in Shillong / India only.
- (b) Any dispute arising out of this purchase shall be referred to the Director, NIT Meghalaya, and if either of the parties hereto is dissatisfied with the decision, the dispute shall be referred to the decision of an Arbitrator, who should be acceptable to both the parties, to be appointed by the Director of the Institute. The decision of such Arbitrator shall be final and binding on both the parties.

ADDITIONAL TERMS FOR IMPORTED GOODS:

Following terms, besides the fore mentioned terms, will be applicable in case of foreign purchases:

1. **Rates :** Rates quoted in the Price Bid should be on DOOR DELIVERY NIT Meghalaya basis, as per details below:
 - a. Ex-works value
 - b. Documentation & Handling Charge, if any
 - c. Estimated Overseas Freight to be paid at actual against authentic documents and monetary receipt
 - d. Estimated Overseas Insurance Charge to be paid at actual against authentic documents and monetary receipt (In case the firm holds open insurance policy, the Insurance Certificate relating to the consignment will have to be provided).
 - e. Total value showing the cost CIP/CIF at any landing air/sea/road/railway port in India and transportation and insurance upto NIT Meghalaya.
 - f. As NIT Meghalaya presently does not have a clearing agent, the supplier or their Indian Agency has to take all responsibilities for clearing the equipment from the landing port in India and for door delivery at NIT Meghalaya.
2. **After Sales Service:** In case of imported stores, foreign manufacturing firms should indicate facilities available for after sales service in India without which their offers are liable to be ignored. The quotation will have to clearly state the available nearest after sales service centre and contact no. in India.
3. **Delivery :**
 - a. Delivery of goods at NIT Meghalaya, will have to be within 100 (one hundred) days from the date of issue of the Purchase Order.
 - b. While trans shipment will be allowed, part shipment will not be allowed.
4. **Payment :**

Above \$10,000.00: By an irrevocable Letter of Credit at CIP/CIF any landing air/sea/road/railway port in India value negotiable through any overseas branch of State Bank of India with unrestricted provision. The Indian Agent is required to submit an unconditional PBG for 10% of the cost of the equipment prior to opening of the LOC. The PBG shall remain valid for period of sixty days beyond the date of completion of all contractual obligations of the supplier including warranty obligations.

Note: Please note LoC will not be opened unless and until Letter of Acknowledgement directly from the principal and PBG in original from Indian agent is received at NIT Meghalaya (Even in case of firms having subsidiary office in India). The Indian agents are therefore advised to submit quotation after consultation with their respective principals.

100% Payment Basis: On request by the supplier/s 100% payment by FDD will be made. In this case on receipt of your Order Acknowledgement an FDD will be established for total ordered value, thereupon, a scanned / photo copy of the FDD will be sent to you, which will enable you to send the materials. On satisfactory receipt and acceptance of the materials or satisfactory installation, training and commissioning of the equipment the Original FDD will be sent to you.

The PBG shall remain valid for period of sixty days beyond the date of completion of all contractual obligations of the supplier including warranty obligations.

Note: Please note FDD will not be opened unless and until Letter of Acknowledgement directly from the principal and PBG in original from Indian agent is received at NIT Meghalaya (Even in case of firms having subsidiary office in India). The Indian agents are therefore advised to submit quotation after consultation with their respective principals.

5. **Agency Commission:** The percentage of ex-works value to be paid to Indian agent in equivalent Indian currency as agency commission (if any) will have to be clearly stated in the quotation.
6. **Country of Origin:** While Country of Origin Certificate will not be insisted, the same however will have to be stated in the Original Invoice for payment through LoC.

LoC/FDD Amendment: LoC/FDD amendment charges due to mistake on the part of the supplier, if any, will have to be borne by the supplier.

Sd/-
Registrar

Encl.: ANNEXURE-I, ANNEXURE-II, ANNEXURE-III.

Annexure –I

A. COMPLIANCE CERTIFICATE FOR NIQ TERMS
(To be enclosed in the Technical bid)

Sl. No.	NIQ Terms and Conditions	Yes/No	
01	Rate quoted as per instruction		
02	AMC rate after warranty provided		
03	Validity of quoted rate for 120 days agreed		
04	EMD submitted / appropriate certificate enclosed		
05	PBG term agreed		
06	Payment term agreed		
07	Delivery terms agreed		
08	Warranty period agreed		
09	Extended AMC (warranty) period year wise for three years with rates provided.	i. 1 st year	
		ii. 2 nd year	
		iii. 3 rd year	
10	Literature: Printed provided		
11	Dealership /distributorship certificate (in case of dealers/agents) provided		
12	Details of supply to other Institutes of National Importance provided		
13	Equipment breakdown clause agreed		
14	After Sales Service: address of nearest after Sales Service centre in the region provided		
15	Manufacturer certificate provided		
16	Applicable law terms agreed		
17	Rate quoted for dismantling, shifting/transporting, reassembling & re-installing at NIT Permanent Campus at Sohra (Cherrapunjee) from old campus Rates provided		
18	All other terms and conditions mentioned in the NIQ (Technical & Financial) agreed		

Signature with Seal:.....
Vendor: M/s.....

Annexure -I

B. COMPLIANCE CERTIFICATE FOR SPECIFICATIONS
(One for each item, must to be enclosed in the Technical bid)

Item Sl. No.		Item Name:	
Quoted Product:	Make:	Model No:	
Specifications as per Annexure-III		Quoted Item Specifications*	Complied/ Deviation
Parameter	Specification		

Signature with Seal:

Vendor: M/S

*** Vendor must quote the parameter specification of the quoted product in this column and not just copy the specification from the tender call document. Failure to do so will lead to rejection of the tender.**

Annexure -II

PERFORMANCE BANK GUARANTEE

To:
The Director,
National Institute of Technology Meghalaya
Bijni Complex, Laitumkhrah, Shillong-793 003
Meghalaya

WHEREAS (Name of Supplier)
hereinafter called "the Supplier" has undertaken, in pursuance of Contract No..... dated,..... 20... to
supply..... (Description of Goods and Services) hereinafter called
"the order".

AND WHEREAS it has been stipulated by you in the said order that the Supplier shall furnish you with a
Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with the
Supplier's performance obligations in accordance with the order.

AND WHEREAS we have agreed to give the Supplier a Guarantee:
THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier,
up to a total of (Amount of the Guarantee in Words and
Figures) and we undertake to pay you, upon your first written demand declaring the Supplier to be in default
under the order and without cavil or argument, any sum or sums within the limit of
(Amount of Guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your
demand or the sum specified therein.

This guarantee is valid until theday of.....20.....

Signature and Seal of Guarantors

.....

.....

.....

Date.....20....

Address:.....

.....

.....

All correspondence with reference to this guarantee shall be made at the following address:

The Director,
National Institute of Technology Meghalaya
Bijni Complex, Laitumkhrah, Shillong-793 003
Meghalaya

ANNEXURE-III
(DETAILED TECHNICAL SPECIFICATIONS)
Technical Specifications and Compliance

<u>Sl. No</u>	<u>Description</u>
<u>1</u>	<p><u>Smart Factory Automation Lab:</u> This lab should be a automated way of controlling and managing the manufacturing process in a factory. It should comprise of many processes that are involved in manufacturing such as</p> <ul style="list-style-type: none"> • Raw Material & Finished Good Storage • Material handling & Transfer Systems • Digitalization of manufacturing <p>The Smart Factory lab should be a modular setup completely integrated as a automated setup with the below items.</p> <p style="text-align: center;"><u>The System Should consist of the following Modules:</u></p> <p>A. AUTOMATIC STORAGE AND RETRIEVAL SYSTEM – 1 Number B. AUTOMATED GUIDED VEHICLE – 1 Number C. INTERMEDIATE TRANSFER STATION – 2 Numbers D. VISION INSPECTION SYSTEM – 1 Number E. CIM CONTROLLER – 1 Number F. DIGITAL TWIN SOFTWARE – 1 license G. ELEARNING</p> <p>A. AUTOMATIC STORAGE AND RETRIEVAL SYSTEM</p> <ul style="list-style-type: none"> • Guides: LM Guides • No. of storage cells: 18 (6 rows x 3 column) • X Axis Travel: Auto: 700 mm Manual: 1000 mm approx. • Y Axis Travel: Auto: 820 mm Manual: 900 mm approx. • Z Axis Travel: 210 mm approx. • Load carrying capacity: Around 2 kg (4.4 lbs.) • Platform traversed in X and Y axes should be by belt and AC servo motors and Z axis through DC motor • Controlled by PLC • Facility for interfacing: Touchscreen HMI for teaching and interfacing with Cell controller/Peripheral. <p>B. AUTOMATED GUIDED VEHICLE:</p> <ul style="list-style-type: none"> • Guidance and Routing for Material flow, Obstacle sensing and accident • Prevention Load transfer through power push/pull. • Load Carrying Capacity: 10 - 24 Kgs • Max. Travel Speed: 15 - 18 m/min <p>Controller:</p> <ul style="list-style-type: none"> • Control: PLC controlled with touch screen HMI • Sensor & Guidance: Line tracing technology • It should align to work to transfer the pallets to various intermediate transfer conveyors and accept the pallets transferred to AGV post processing.

C. INTERMEDIATE JOB TRANSFER STATION (TRANSFER CONVEYOR)

Intermittent conveyors/material transfer system from one module to another.

- Length of Conveyor: 450 - 520 mm
- Type of Transmission: Flat Belt
- Drive: DC Geared motor

D. VISION INSPECTION SYSTEM

- Inspection Items : 360° Model position compensation, Edge position compensation,
Linear Correction
- Number of Inspection Sensors: 4
- Number of simultaneous measurements: 32

Should have the following capabilities

- Pattern Retrain
- PC Software Setup
- Sensor View Setup & Display
- built in image processor
- Real Colour Image processing method
- Maximum Inspection Rate : 30 HZ (800 parts per minute)
- Resolution : 752 × 480
- Lens : 5.8mm
- Image filter : High dynamic range (HDR),polarizing filter, white balance, brightness correction and image adjustment
- Image elements : 1/3-inch color CMOS
- Images logging : 20 images
- Auxiliary function : Statistical data, Test Measurements, I/O monitor, Password function,
Simulation software, Sensor error history, Calibration, Math
- Input signals : Single measurement input (TRIG) Control command input (IN0 to IN5)
- Communication : Ethernet TCP no-protocol, Ethernet UDP no-protocol, Ethernet
FINS/TCP no-protocol, EtherNet/IP, PLC Link , or PROFINET
- Interfacing ability : Can be interfaced with CIM,FMS or any setup
- Power : 21.6 to 26.4 VDC (including ripple)
- Features : Inspection, Positioning, OCR Method to Quickly Read Characters etc

E. CIM CONTROLLER

Cell controller - PLC with OPC/Profinet enabled communication. ASRS, AGV, Vision Inspection system should be interfaced and controller via the CIM Controller and connect to the digital twin via the below mentioned software.

F. DIGITAL TWIN SOFTWARE:

The User should be able to do the following

- Production & Process Planning
- Work-Flow Simulation
- Other manufacturing features such as

The software suites should be able to understand the manufacturing planning, simulation and Production. It should have the complete Digital Manufacturing Plant Simulation, Robotics & Automation Suite.

Functions:

- **Planning Module:** The software should cover the area of Process planning, Work instructions, layouts designing and dimensional quality.
- **Simulation Module:** The software should cover the area of assembly simulation, robotics integration with manufacturing, line balancing and on ergonomics analysis.
- **Production Module:** The software should cover the area of issue Tracking, Virtual commissioning, shop Floor and built Quality.

Features:

- Integrating multiple sources of product and process information.
- Part Planning and Validation should enable part manufacturing companies to accurately and efficiently define the manufacturing process plan and directly connect it to production systems.
- Assembly planning and Validation module should help trainees to virtually design and evaluate assembly process scenarios and quickly arrive at the best plan for building products.
- There should be inbuilt tools facilitating process design and sequencing, manufacturing bill of material (mBOM) management, line balancing, time management, 3D plant layout and ergonomic analysis.
- Robotics and Automation module should enable a platform to virtually develop, simulate, and commission robotic and other automated manufacturing systems from facilities producing dedicated products to mixed-model production facilities with combinations of built variants.
- The Software should have a platform for virtual commissioning alleviating the dependency on physical tryouts by allowing for the debug and test of manufacturing systems, virtually.
- Plant Design and Optimization module: Simulate the efficiency of operation, resource utilization, bottle neck analysis, power utilization, logistic flow and optimization, breakdown analysis, OEE @ Equipment level and plant level.

Connecting to the Software Lab:

The digital twin for the product should be demonstrated – the digital twin essentially means a virtual replica of the physical system on this module. The virtual system should emulate and simulate the physical system with identical properties. It should be possible for the digital twin to be scaled up and shown as a complete factory in the Software.

The Product should be IoT ready and it should allow NIT to connect an IoT system to the hardware and collect data and monitor performance in the future.

Digital twin should be submitted in the form of a MP4 Video file (in a CD/USB Drive) along with the tender file.

G. e-Learning – 100 Users for a period of one year

A complete list of interactive E-Learning covering the below topics should be also provided along with the entire setup. The courses should be clearly broken down into Number of hours, designed it in a structural way allowing the trainees to pick courses at different levels. These courses should be compatible to the NSDC aligned programs as well.

All the courses should be online subscription for a minimum period of 1 year.

The Digital library should be a collection of Reference, Learning and Training material in Advanced Manufacturing Technology. The technologies covered are CNC, Robotics, Automaton and Mechatronics. This library should be applicable to all engineering levels – Universities, Institutions, Polytechnics, Training Centers and Corporate learning centers. Many institutions have already begun the task of converting their traditional collections of books and educational materials to electronic format: HTML, PDF formats or eBooks. Features of the Digital Library should be:

Comprehensive Coverage

The Digital Library should offer a wide range of content in Advanced Manufacturing Technology. The content should align with current industry demands and oriented to build skills while enhancing learning. Students can access the content across different branches of engineering and application.

Access at Your Fingertips

It should give access to multiple contents accessible from any computer in our institute and access must be through the internet. Students should be able to learn at their pace. Multiple students should be able access the same content from a Digital Library unlike a book which will have limited number of copies.

Interactive Content

The content should be highly interactive and interesting. Using this Multimedia Digital Library students should be able to understand various concepts with the help of rich Graphics, Animations, Videos and Voice over.

The courses should be to be managed by a Learning Management System (LMS).

Learning Management System – Features required are

- Friendly and attractive user interface with a 3-tier architecture for managing clients
- Dashboard for viewing all relevant information on the platform in one glance (for each tier above)
- Comprehensive reports, based on users, courses, and enrolments
- Ability to add varied types of content, including PPT, PDF, videos, assignments, etc.
- Availability on mobile and tablet devices
- Batch user import (for adding a large number of users to the LMS in one go)
- Support for learning best practices such as spaced retrieval

It should be possible to generate the following reports from the MIS:

- MIS on number of courses conducted.
- Course wise enrolment.
- Preferred Courses
- Enrollment Vs Successful Completion
- Categorization of trainees – students/ faculty / industry / specialization

eLearning Content to be offered for the following technologies:

- Smart Factory Automation
- Robotics
- Mechatronics

- CNC

Note: A trail access for a period of 30days of the elearning through the LMS should be given for one of the hardware labs.

Special Condition of contract:

- Minimum 10days of training should be provided by the bidder.
- The bidder should mention about the utilities required for the setup.
- Upon receipt of the order, the bidder must submit the site readiness document with the drawings for enabling NIT to get the site ready for the Centre to function.
