

**Expression of Interest (EOI) for selection of Technology Provider to setup a  
Centre of Excellence for imparting high-end skill training, Industrial Consultancy  
& Research works in the Field of Industry 4.0 & Digital Manufacturing  
Technology**

**National Institute of Technology,  
Sector 1, Rourkela,  
Odisha 769008  
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**EOI No.: NITR/PW/2019/01**

**Date: 08.11.2019**

1. Director, NIT Rourkela invites “EOI” (Expression of Interest) from eligible firms for “Selection of a Technology Provider to set up a Centre of Excellence for Research & Development and imparting high-end skill training in the **field of Digital Manufacturing Technology (Industry 4.0)**).
2. Participating Agencies (Technology Providers – TP) must fulfill the following pre-requisites:

<b>S. No</b>	<b>Qualification Criteria</b>
a.	Technology Provider should be a company recognized for providing technological products in the areas listed in the Section 4 Technical Scope.
b.	Technology Provider should not have been blacklisted by any Government/ Department/ Body.
c.	TP should have been in existence as a registered company in India for at least 10 years. The Technology Provider must have a Turnover of at least Rs. 100 cr. Per year in India in the each of the last 3 years. The Technology Provider must have global presence in at least 50 countries. (Suitable evidence to be provided)
d.	Existing COE Setups: The Technology Provider must have similar experience of setting up COE’s for at least 5 years. The Technology Provider should have executed minimum 5 such COE’s within India - Minimum 2 CoEs should be with central government institutions and at least 3 CoEs with state Government institutions. A copy of agreements must be submitted. Please note that the Technology Provider must be the same as mentioned in the copies of agreement submitted. Technology Provider must have a R&D Facility in India and have their direct and own training centers for some of the proposed labs. The Technology Provider must be globally implementing such CoEs through direct programs. (Suitable evidence to be provided)
e.	Domain Expertise: The Technology Provider should be in the domain, in at least 60% of the mentioned labs as per the technical scope. Minimum 7 out of the 11 labs should be offered directly by the Technology Provider (TP should offer proprietary items

	<p>manufactured by them in these 7 labs.) Baring utilities such as computer, compressor, stabilizer, the primary equipment / software in 60% of the labs must be a product owned by the Technology Provider. Out of the balance 4 labs the Technology Provider must offer key components that are used in the equipment. This is to ensure that they are part of all the labs and thus are defined truly as a Technology provider in the industry and thus a Technology Provider for the CoE.</p> <p>(Suitable evidence to be provided)</p>
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1. The documents may be downloaded free of cost from the website <https://www.nitrkl.ac.in>
2. The EOIs shall be submitted to the Office of the Registrar, National Institute of Technology, Rourkela, in a sealed envelope. The EOI in proper format should be submitted in person or sent by courier, registered/ speed post etc., to The Registrar, National Institute of Technology, Sector 1, Rourkela, Odisha 769008. Each page of the EOI should be signed by the competent authority of the applicant.
3. All amendments, time extension, clarifications etc. will be uploaded on the website only and will not be published in newspapers. The interested parties should regularly visit the website to keep themselves updated. Unsolicited query, communication will not be entertained.

**Key dates:**

Sl.	Description	Important Information
1.	Date of Invitation for EOI	08.11.2019
2.	Due date & time for downloading the documents	29.11.2019 up to 2.30 PM
3.	Due date & time for submission of EOI	29.11.2019 up to 3.00 PM

### 3. Scope of the Project

NIT Rourkela is inviting an expression of interest from Technology Providers to setup a Center of Excellence that focuses on upcoming manufacturing technologies related to industry 4.0 & Digital Manufacturing Technology at NIT Rourkela.

It is a turnkey project where the Technology Provider will be responsible for the supply of the technological product / lab Hardware and software, commissioning of it and should run the lab along with the institute faculty for a period of 3 Years. It must be state-of-the-art and industry relevant and should cater to the current and futuristic requirements of the industry.

NIT Rourkela will provide infrastructure to setup the Center of Excellence. About 12000 Square Feet of space has been identified. The details of the space will be provided to the Technology Provider upon selection. The Technology Provider (Technology Provider) should provide a grant of at least **85%** on total project value (Project value should not exceed Rs 200 Crores – As per MHRD Guidelines) and the balance upto 15% will be provided NIT Rourkela. The Technology

Provider once selected can sign a Memorandum of Agreement (MOA) with their authorized representative.

The Center of Excellence should be an interdisciplinary, industry backed center focused on developing skill excellence in the field of Design, Digitalization and Industry 4.0. Through the training and implementation of industry-relevant technology and processes, the center should facilitate a multi-disciplinary learning environment across Technology, Engineering, and Science and Management faculties. It should meet the demands of the industries' ever-changing processes and help build skills around collaboration and innovation. The center should leverage the Technology Provider's capability to draw upon the expertise from various areas of automotive, automotive suppliers, Aerospace, Defense and their suppliers, Industrial Engineering, Electrical and Process Industries such as Mining, Process Industries such as Iron and Steel, Energy, Cement, Pharma, Food and Beverage, Chemical etc. and provide its Partner with knowledge and tools.

The center should focus on Research and Development and bridge the skill gap of students' vis-à-vis Today's industry needs and impart state-of-the-art industry-oriented training. The mission of this Centre of Excellence should be to promote advancement and implementation of advanced digitalization in manufacturing concepts through research and education partnership with the industry.

#### **4. Objective**

The COE should bridge the skill gap of students vis-à-vis industry needs and impart state-of-the-art industry-oriented training to help foster significant innovation and learning in technical education. The mission of the Centre of Excellence should be to promote implementation & advancement of Product Lifecycle Management and advanced digital manufacturing-factory concepts through research and education partnership with the industry.

- The center is aimed at Industry connected skill development programs and hence the proposal should also have a MOA with leading Technology Company.
- This center should be on Build, Operate and Transfer Mode.
- All the Hardware should be of industrial standards.
- The software should not be restricted to educational limits. Should be provided with industrial features allowing the Client to offer Industrial consultancy and research as well, apart from the skill development.

#### **5. Centre of Excellence**

Centre of Excellence in Industry 4.0 and Digital Manufacturing Technology with NIT, Rourkela to address industrial needs of skill development and consultancy in the areas of engineering, product design & development and advanced manufacturing technologies towards the following domains:

- a. Automotive – passenger vehicles, commercial vehicles
- b. Aerospace

- c. Industrial machinery – off highway vehicles, farm equipment and implements, electrical and mechanical machineries
- d. Industry 4.0
- e. Digital Factories.
- f. Ship Building
- g. Industrial Automation
- h. Mining
- i. Energy
- j. Process Engineering

## 6. Technical Scope

### Concept

The overall plan, as part of this program is to encourage a TP to setup a Centre of Excellence (CoE). The CoE is being setup to offer an interrelated high technology, modular, skilling facility and offer demand driven courses.

The CoE, to be designed by the TP, is envisioned to be setup as a State of the Art Centre of Excellence (CoE) in which the TP brings in their best in class equipment/ tools/ machines/ simulators (commonly referred to as equipment) to be used for training purposes. The COE will be located in an appropriate space offered by the client. The CoE will be managed professionally by the TP. The infrastructure for the CoE will be made ready by the client as per the specifications given by the TP.

The Technology Provider will be responsible for devising and implementing a three-year rolling plan and ensuring that the CoE is constantly upgraded and provides a high technology ecosystem for skilling/ up-skilling/ re-skilling/ cross-skilling and multi-skilling. The TP will be expected to assist the client to mobilize students for training which will help generate revenues at the CoE which can help offset the overall costs of the CoE.

Overall administrative, quality and financial responsibilities including the management of the CoE, marketing, branding, placement, costing of courses, management of hostels, course content, pedagogy, funding etc. will be the responsibility of the Client. The Client may engage with, invite and sign MoUs with industries (such as equipment manufacturers, tool and device manufacturers that service the sector) and continuously engage with the industries to ensure that the CoE remains relevant at all times.

### Responsibility of the Technology Provider (TP)

The role of this TP shall include the following:

1. To design the CoE and to develop a three years strategic rolling plan for the CoE along with the client and be responsible for implementing the plan.
2. Identify and formulate training programs to develop skills in futuristic/ disruptive technologies and associated skill sets required for industry ready.
3. To develop courses, course content, course work, manuals, standard operating procedures and standards, disseminate the same with the overall intent of improving the skill sets of individuals

4. To impart high-end skills (and not generic skills) to Students, unemployed individuals and employed individuals (looking to up skill/ re-skill themselves).
5. To conduct train the trainer programs.
6. To conduct need based/ on-request training programs to cater to specialized requirements of corporate, and to generate revenues through these programs.
7. To carry out assessment, certification of trainees.

## **Digital Manufacturing**

The proposed Center of excellence focuses at Digital manufacturing. Digitalization is changing our daily lives and revolutionizing the world economy. Successful companies are seizing the opportunities offered by digitalization for lower costs, improved quality, support individualized production, and provide flexibility and faster response to customer/market demands and new business models. We are in the midst of the digital industrial revolution.

## **Digital Twin**

Industries are upgrading phase to Industry 4.0, which originates from the concept of Digital twin. Digital Twin is an accurate virtual representation of products, processes, operations, and performance. For products and assets, a digital twin flows from a geometric model. But it's not a single representation — it's a twin for each product sold, each piece of equipment in a factory, or every item in an installed base. The goal is to provide DVR-like capability — I can rewind to see what happened, play to see what is happening, and fast-forward to see what might happen (a simulation).

The value of the digital twin in manufacturing offers a unique opportunity to virtually simulate, validate and optimize the entire production system. It also lets you test how the product with all its primary parts and sub-assemblies will be built using the manufacturing processes, production lines and automation.

Hence in the center of excellence there should be advanced product design and process design software that can connect to the hardware provided in the other labs to form Digital twin / Digital manufacturing. The proposed list of labs in this Center of Excellence should encompass upcoming manufacturing technologies related to industry 4.0 (Digitalization).

**Note: The Digital twin for at least 3 of the hardware labs should be recorded in a video format and submitted along with the EOI in a USB Drive (Mandatory labs for which the Digital Twin should be provided are industry 4.0 Lab, Mechatronics Lab).**

## Supply of labs/Items:

S.No	Labs	Quantities
Note: All products supplied must be of industrial grade. Educational / training setup will not be accepted, unless mentioned otherwise. In each lab, any additional utilities, accessories and appropriate quantities can be offered by the Participating Party as per their EOI. Consumables as required must be provided to run the setup for duration of 6 months.		
1	Product Design lab - Software lab	Minimum of 20 Licenses
2	Mechatronics lab	Minimum 1 for teaching and 1 for student practice
3	Power Lab	Should consists of the following <ul style="list-style-type: none"> <li>- Solar System</li> <li>- Power Distribution &amp; Transmission System</li> <li>- Substation Automation System Panel</li> <li>- Participating Party to offer suitable quantity</li> </ul>
4	Motors and drive control lab	<ul style="list-style-type: none"> <li>- Minimum 1 set: AC/DC Drive system integrated with PLC</li> <li>- Minimum 1 set: Industrial grade Switch gear setup</li> <li>- Participating Party to offer suitable quantity</li> </ul>
5	Computer Aided Engineering (CAE) and analysis lab - Software and hardware lab	<ul style="list-style-type: none"> <li>- Minimum 20 Licenses</li> <li>- Minimum 1 test bed for automobile model and 1 test bed for plane model.</li> </ul>
6	IoT (Internet of Things) – Cloud based IoT	<ul style="list-style-type: none"> <li>- Minimum 20 user access with 30 - 50GB Data storage</li> <li>- Prebuilt IoT apps connecting to the labs like Smart Manufacturing, Mechatronics, &amp; CAD / CAM Manufacturing Lab.</li> </ul>
7	Manufacturing process lab - Software lab	Minimum of 20 Licenses
8	Industry 4.0 – Smart Manufacturing Lab	One completely integrated setup with all the necessary equipment as mentioned in the technical scope.
9	Automatic Welding robot	<ul style="list-style-type: none"> <li>- One Spot Welding cell</li> <li>- One MIG Welding cell with Laser Seam Tracking system</li> </ul>
10	Sensors and instrumentation lab DCS system with Sensors	<ul style="list-style-type: none"> <li>- Minimum 1 set: DCS System with set of Sensors for different technologies.</li> <li>- Participating Party to offer suitable quantity</li> </ul>
11	CNC Controller lab	<ul style="list-style-type: none"> <li>- Advanced level controller for training on advanced applications necessary in aerospace and medical components</li> <li>- Basic level controller as used in industries today.</li> <li>- Participating Party to offer suitable quantity</li> </ul>

S. No	List of labs
1	<p><b>Product Design lab</b></p> <p>The Design Lab should consist of advanced Computer Aided Design (CAD), Computer Aided Engineering (CAE) and Computer Aided Manufacturing (CAM) software. These Solutions assist the students to understand engineering design and analysis. The Product Design Lab would cater to the following areas</p> <ul style="list-style-type: none"> <li>• Industrial Design &amp; Styling</li> <li>• Package Design</li> <li>• Mechanical Design</li> <li>• Electromechanical Design</li> <li>• Mechatronics concept Designer</li> <li>• Mechanical Simulation</li> <li>• Electromechanical Simulation</li> <li>• Tooling, Die &amp; Fixture Design</li> <li>• Machining</li> <li>• Quality Inspection</li> <li>• Design for Additive Manufacturing</li> </ul>
2	<p><b>Mechatronics lab</b></p> <p>The Mechatronic lab should have equipment that will bring together different technologies and departments of engineering like Mechanical, Electrical, Electronics &amp; Communication and Computer Science. The equipment should allow students to work on a mini factory setup that consist of various items working on areas such as Pneumatics &amp; Hydraulics, Sensors, Communication Protocol, PLC programming, PLC Networking using profibus and profinet.</p> <p>The mechatronics kit should be able to interface with the software in the Product design lab for digital twin. It should be possible for the digital twin to be scaled up and shown as a complete factory in the Manufacturing Process Lab. The Product should be IoT Ready and able to communicate to IoT system to collect data and monitor performance, in the future.</p> <p><b>Note:</b> Digital Twin for this lab should be recorded in a video format and submitted along with the EOI in a USB Drive</p>
3	<p><b>Power Lab</b></p> <p>A Medium Voltage POWER LAB to study about Solar Power Generation, Automation Based Distribution &amp; LV – Utilization. The Power lab should consist of the below things:</p> <ol style="list-style-type: none"> <li>1. Solar Power generation system</li> <li>2. Power distribution and transmission system</li> <li>3. Substation Automation System panel.</li> </ol> <p>MV-Power (Energy) Trainings should be based on following concept:</p> <ul style="list-style-type: none"> <li>- <b>Power Generation</b> with SOLAR Energy Panel/Inverters.</li> <li>- MV - <b>Power Distribution</b> (Step-up transformer, VCB &amp; Substation Automation)</li> <li>- LV – <b>Power Utilization</b> (Step-down transformer MV/LV, LV-Isolator &amp; LV-Load)</li> </ul>

4	<p><b>Motors and drive control lab</b></p> <p>The Lab should consist of equipment focusing on the following areas;</p> <ul style="list-style-type: none"> <li>● AC/ DC Drives: Should be able to teach students on the usage of drives from the industries where they are used to how to vary the speed as per process/application requirement and how it controls the various motor parameters. Drives PLC Networking using Profibus or Profinet.</li> <li>● Switchgears: Students should be introduced to how in power system switchgears are used to control, protect and isolate electrical equipment's. Low voltages switchgears also used in residential, industrial and commercial segments.</li> </ul>
5	<p><b>Computer Aided Engineering (CAE) and analysis lab</b></p> <p>The CAE Lab should allow testing and mechanical simulation to model-based systems engineering. It should enable engineers to understand the functional performance engineering of mechatronic systems to solve noise, vibration and harshness (NVH), acoustics, durability, dynamics, performance, fuel economy and controls development issues.</p> <p>The 3D CAE should help students and industry predict performance across all critical attributes earlier and throughout the entire product lifecycle. The computational fluid dynamics solution should allow students &amp; industry to simulate almost any engineering problem that involves the flow of liquids, gases (or a combination of both), together with all of the associated physics.</p> <p>It should also consist of a Physical Test Bed for carrying out analysis such as NVH, Acoustics, etc. on products such as a scaled down plane model and a two-wheeler (2/4 Stroke IC Engine and Electric), along with appropriate sensors and SCADA Systems.</p>
6	<p><b>Internet of things</b></p> <p>The Internet of Things, or IoT should cover the following topics for the students in the Internet of Things (IOT) Lab:</p> <ul style="list-style-type: none"> <li>● Connecting Things – Appropriate Gateway should be provided to connect different sensors and collect Data.</li> <li>● Data Analytics – Students should be able to write their own algorithm to analyze the kind of data needs to be filtered.</li> <li>● Application Development – Students should be able to develop their own application to display the right Data.</li> <li>● Enterprise Deployment – Application deployment in the cloud</li> </ul> <p>The IoT lab should be able to connect to the Smart Factory Lab, mechatronics lab, for Data collection and analysis. If there are additional labs that can be connected to the IoT, Kindly list it out with details.</p>
7	<p><b>Manufacturing Process lab</b></p> <p>The Manufacturing process Lab should consist of Digital Manufacturing Solutions which assist the students to understand manufacturing planning and validation. The lab should also consist of the Product Lifecycle Management Solution which allows students to learn the enterprise solutions of product development from end to end. It should cater to the following areas:</p> <ul style="list-style-type: none"> <li>● Process Planning, Electronic Work Instructions and BOM Management</li> <li>● Dimensional Quality</li> <li>● Layout and Plant Simulation with integration to Design of Experiments</li> <li>● Design for Assembly, Design for Manufacturing, Design for Maintenance</li> <li>● Ergonomic Analysis</li> </ul>



	<ul style="list-style-type: none"> <li>• Robotic Simulation, Offline Programming and Realistic Robot Simulation (RRS)</li> <li>• Virtual Commissioning</li> <li>• Build Quality Tracking &amp; Shop Floor Integration</li> </ul>
8	<p><b>Industry 4.0 - Smart Manufacturing lab</b></p> <p>Industry 4.0 / Smart manufacturing should have equipment with fully automated way of controlling and managing the manufacturing process in a factory. It should consist of many processes involved in manufacturing such as</p> <ul style="list-style-type: none"> <li>• Manufacturing</li> <li>• Inspection &amp; Quality Control</li> <li>• Assembly station</li> <li>• Automatic Raw Material &amp; Finished Goods Storage</li> <li>• Material handling &amp; Transfer Systems</li> <li>• Digitalization of manufacturing</li> <li>• Data Management and RFID communication system</li> </ul> <p>The concept should bring together manufacturing, automation and data management leading to intelligent collaboration, monitoring and process management in real-time. It should be a modular setup enabling the training to be conducted in increasing order of complexity: modules, stations and complete system.</p> <p>The Industry 4.0 setup and the software provided in the Manufacturing process lab should be able to interface for the Digital Twin, which should emulate and simulate the physical system with identical properties and possible to transfer the program from the manufacturing Process lab to the Industry 4.0 lab – for control and operation of the hardware.</p> <p>It should be possible for the digital twin to be scaled up and shown as a complete factory in the Manufacturing Process Lab. The Product should be IoT ready and possible for an IoT system to be connected to the hardware and collect data and monitor performance, in the future.</p> <p><b>Note:</b> Digital Twin for this lab should be recorded in a video format and submitted along with the EOI in a USB Drive</p>

9	<p><b>Automatic welding Robots</b></p> <p>In this lab there should be different types of welding which is controlled and programmed by robotics. We would be teaching the students to understand the working principals of a Robot, how to program it and apply it to an application. There would be two (2) robotics cells catering different applications, they are:</p> <ol style="list-style-type: none"> <li>1. Spot Welding</li> <li>2. MIG Welding with laser Seam tracking.</li> </ol> <p>The robot should be provided with the complete cell consisting of the below items.</p> <ul style="list-style-type: none"> <li>- Articulated robot</li> <li>- Welding system, Welding fixtures &amp; accessories</li> <li>- Robotic Welding Torch/Gun</li> <li>- Laser Seam tracking system for MIG Welding robot</li> <li>- Electrical panel and accessories</li> <li>- Safety equipment like glass partition or Curtain</li> <li>- Welding machine consumables</li> <li>- Raw materials for testing.</li> </ul> <p>The robots should be able to interface with the software provided in the Manufacturing process lab for Offline programming &amp; Digital Twin. It should be possible for the digital twin to be scaled up and shown as a complete factory in the Manufacturing Process Lab. The Product should be IoT Ready and able to communicate to IoT system to collect data and monitor performance, in the future.</p>
10	<p><b>Sensors and Instrumentation lab</b></p> <p>The Process Instrumentation Lab should enable students and industries to work on Advance Automation using Distributed Control Systems (DCS) and understanding the working of the following equipment's in a plant. The types of sensors offered should include Temperature, Flow, Level, Pressure, Sensors/Measurements &amp; Communications</p>
11	<p><b>CNC Controller lab</b></p> <p>This Lab should have equipment that can enable students to understand the concept of CNC Programming and work real time different controllers for Turning and Milling applications. The students should be able to work on advanced controls that can support programming upto 31 Axis. This would enable students to program complex jobs.</p> <p>The CNC controller should be able to interface with the product design lab to learn &amp; create CNC Programs and validate the Machine operations and parameters. The students can learn how to program and test the CNC Program. The Lab should also focus on the usage and functionality of HMI for diagnostics and troubleshooting. Should have a rack to explain how CNC Programs control the Drives and Motors.</p>

## Services to be provided

<i>S. No</i>	<i>Description</i>
1	<p><b>Project Management</b></p> <p>Once when the MoA is signed and PO is released, the TP should work closely with NIT Rourkela in planning and execution of the COE.</p> <ul style="list-style-type: none"> <li>- Should define the delivery timelines.</li> <li>- Should work closely with the NIT Rourkela for the site readiness</li> <li>- Responsible for commissioning of all the items and ensure the entire lab is up and running.</li> <li>- Conduct Train the Trainer</li> <li>- Conduct One Industry Seminar every Semester</li> </ul>
2	<p><b>E-learning courseware</b></p> <p>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 version. An evaluation login or access should be submitted along with the EOI for evaluation for CNC and Robotics Technology.</p> <p>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:</p> <p><b>Comprehensive Coverage</b></p> <p>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.</p> <p><b>Access at Your Fingertips</b></p> <p>It should give access to multiple contents accessible from any computer in our NIT Rourkela 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.</p> <p><b>Interactive Content</b></p> <p>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).</p> <p><b>Learning Management System – Features required are</b></p> <ul style="list-style-type: none"> <li>● Friendly and attractive user interface with a 3-tier architecture for managing clients</li> </ul>

	<ul style="list-style-type: none"> <li>● Dashboard for viewing all relevant information on the platform in one glance (for each tier above)</li> <li>● Comprehensive reports, based on users, courses, and enrolments</li> <li>● Ability to add varied types of content, including PPT, PDF, videos, assignments, etc.</li> <li>● Availability on mobile and tablet devices</li> <li>● Batch user import (for adding a large number of users to the LMS in one go)</li> <li>● Support for learning best practices such as spaced retrieval</li> <li>● Learning management system should be suitable for conducting training programs engineering institute.</li> </ul> <p>It should be possible to generate the following reports from the MIS:</p> <ul style="list-style-type: none"> <li>● MIS on number of courses conducted.</li> <li>● Course wise enrolment.</li> <li>● Preferred Courses</li> <li>● Enrollment Vs Successful Completion</li> <li>● Categorization of trainees – students/ faculty / industry / specialization</li> </ul> <p>eLearning Content to be offered for the following technologies:</p> <ul style="list-style-type: none"> <li>● Industry 4.0 - Smart Manufacturing</li> <li>● PLC, Automation</li> <li>● CNC</li> <li>● Robotics</li> <li>● Mechatronics</li> <li>● Sensors and instrumentation</li> <li>● CAD, CAM</li> </ul>
3	<p><b>Lab Management</b></p> <ul style="list-style-type: none"> <li>● The COE should work in the BOT Model (Build, Operate and Transfer Mode) for a period of 3 years.</li> <li>● Atleast 12 Engineers with mix of experience must be deputed for this period for individual labs who will be the technical resource for the respective labs.</li> <li>● The Engineer's activities are to conduct training activities, support our faculties technically in the research and industrial consultancy.</li> <li>● The engineers should have good written &amp; oral communication, domain expertise, flair for teaching &amp; conversant with engineering software.</li> <li>● Senior Trainers should have minimum graduate or post graduate qualification in engineering and minimum 3-4 years of experience.</li> <li>● Trainers should have minimum Diploma or Graduate qualification in engineering and 2-3 years of experience.</li> <li>● There should also be a center manager deputed by the Technology Provider who would be supervising the activities like enrollment of students, certification for students, Seminars and conferences being conducted, Maintenance of reports of the center Activity.</li> <li>● The center Manager should have minimum a graduate or Post graduate qualification in Engineering with minimum 6-8 years of experience and 2-3years of experience in Project management.</li> </ul> <p><b>SCOPE OF WORK –</b>  TP (if any) should provide the following –</p> <ul style="list-style-type: none"> <li>● Managing the equipment in the lab and conducting the skill training programs</li> <li>● Ensuring trainer availability for the training programs</li> <li>● Provide update course material.</li> <li>● Maintain the equipment for the duration of the BOT period</li> </ul>

	<p>TP will manage the labs assigned by performing the following activities -</p> <p><b>COURSES SCHEDULING AND IMPLEMENTATION OF TRAINING PLAN</b>  The TP shall be responsible for scheduling, conducting Training. TP will present the schedule to the Project Manager of the institute and get it approved and declare it.</p> <p>The Technology Provider, with the assistance of NIT Rourkela, will market the course and enroll the participants and schedule participants and other activities essential to training. Training plan, including procedures for course enrolment, reporting of course progress, course completion and certification, monitoring of the training program, training records.</p> <p><b>TRAINING METHODOLOGY</b>  TP should use digital material to teach theory, to make the understanding easy. TP will follow theory in learning and simulation for practical and usage of equipment to complete the effective learning and completion of the course. Knowledge checks will be used effectively to monitor the process during the training.</p> <p><b>EVALUATION PROCESS &amp; CERTIFICATION</b>  There should be pre and post course test will be conducted for the participant to monitor the learning and understand the knowledge level prior to the course.  The eligible participant should be given certificates. The evaluation process can be determined by the TP and process it accordingly.  The certification should be a tripartite agreement between NIT Rourkela, the Technology Provider.</p> <p><b>AUDITING</b>  NIT Rourkela may conduct periodical audit of the center. The audit includes both academic, and general, one senior executive (from the Institute) will be visiting the center and go through the activities carried out in terms of courses conducted, performance of the students and feedback given by the participants. The process also involves collecting the feedback on faculty, course, course ware and suggestions separately, so that clear complete relevant data is collected to work towards improvement. This information will be analyzed, and suggestions will be given to the tenderer to work towards improvement of the center. The suggestion should be documented and implemented within a mutually agreed timeframe. This will not include replacement of any hardware / software / content. The senior executive will also involve a team from NIT Rourkela to market the courses in the region to enable the successful functioning of the center.</p> <p><b>REPORTS</b>  Supplier will provide the following reports every quarter. The below reports are not exhaustive.  MIS on number of courses conducted.  Course wise students' enrolment.  Course wise skills gained  List of successful students.  Footfall to the Centre.</p>
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Note: Utilities like Stabilizer, compressor and computers required to run the labs will also be in the scope of the Technology Provider.

## **7. Other Terms**

Any other matter incidental to or connected with the project shall be detailed and added after discussion with the parties who submit Expression of Interest and selected in the process.