



NIELIT CALICUT
(Autonomous Scientific Society of Ministry of Electronics & Information Technology, Govt. of India)
NIT Campus Post, CALICUT-673 601, KERALA
Email: purchase@calicut.nielit.in Web: <http://nielit.gov.in/calicut>
Phone: 0495-2287266

LIMITED TENDER ENQUIRY

Ref. No.: 2(1201)/2020-21/3DPAM/AMToT

Date: 24.08.2020

To

DUE DATE: 14.09.2020

TENDER OPENING DATE: 16.09.2020 TIME: 2:00 PM

1. Quotations are invited for the supply of the items/provision of services as per Annexure-I.
2. The quotations duly **SIGNED, SEALED AND SUPERSCRIBED ON THE ENVELOPE WITH THE REFERENCE No. AND DUE DATE**, should be addressed to the undersigned so as to reach on or before the due date stipulated above. Quotations received after the due date will not be considered.
3. Quotation will be opened at the above address on the date and time mentioned above. If this day becomes a holiday, the same will be opened on the next working day. The Tenderer or his authorized representative can be present during tender opening.
4. The quotations should be valid for acceptance for a period of **sixty days** from the due date
5. Quotations will not be accepted by Fax, Email or any such electronic data transfer form.
6. The quotations should be for goods exactly conforming to our requirements and specifications.
7. Relevant literature pertaining to the items quoted with full specifications and drawings, if any should be sent along with the quotations, wherever applicable. Samples, if called for, should be submitted free of charges and collected back at the supplier's expenses.
8. Copy of Manufacturing licence, Principal or Authorized Distributor/Dealer Certificate, and Proprietary Certificate, as applicable, should be enclosed.
9. Quotation should be for **free delivery** at our Centre and should clearly specify the **delivery period**. If delivery quoted is Ex-Godown/Consignor Station, delivery charges consisting of freight, packing & forwarding charges, insurance, etc. should be indicated separately. Goods should be supplied duly carriage paid and insured.
10. GST Registration Number of NIELIT Calicut is: **32AAATD0315M1Z6**. GST or any other taxes may be charged as per the rates applicable to Scientific/Educational institutions.
11. **Security Deposit @ 5% of the Purchase Order/Invoice value shall be retained, in case order/contract value exceeds Rs.1,00,000/- (Rupees one lakh), which will be released after the expiry of warranty period.**
12. Goods shall not be supplied without an official purchase order.
13. Payment: Payment will be made after completion of supply, installation/assembly and commissioning of the items covered by the order along with necessary spares supplied to the entire satisfaction of NIELIT CALICUT. Payment against invoices shall normally be made within 30 days of receipt and acceptance of equipment/materials at our office. **No advance payment will be made under any circumstance.**
14. Incomplete quotations and quotations which do not comply with all the above instructions are liable to be summarily rejected.
15. NIELIT CALICUT does not bind itself to accept the lowest or any such quotation and has the right to accept or reject whole or any part of tenders or a portion of the supply of goods without assigning any reasons. No correspondence in case of rejected tenders will be entertained.
16. Earnest Money Deposit (EMD) for **Rs. 3,125/-** be deposited by NEFT in the Bank Account No. 10401158037 (IFSC: SBIN0002207) at State Bank of India, NIT Calicut Branch, CREC Campus, Chathamangalam, Calicut – 673 601, in favour of Director, NIELIT CALICUT, failing which the quotation will be rejected. Proof of Deposit of EMD amount with Tenderer's Bank Account No. and IFSC No. should be submitted with the Quotation. Alternatively, the Tenderer may choose to submit EMD/Bid Security Declaration, as given in **Annexure-II**, subject to the conditions stipulated therein.

Yours faithfully,


Purchase In-Charge
For Executive Director

Encl: Annexure

ANNEXURE-I

Your Quotation No.

Date:

1	Description of item(s)	Conducting Online Training on Additive Manufacturing" for ToT
2	Specifications & Quantity : As per Specifications attached.	
3	Price per unit in Rs. (in figures & words)	
4	Total Price in Rupees (in figures & words)	
5	Delivery Period	
6	Terms of Delivery	
7	Taxes, Duties & any other statutory levies or charges	
8	Transportation, Insurance, Packing & Forwarding charges, if any	
9	Discount/off etc., if any	
10	GST Registration No.	
11	Payment Terms	
12	Validity of Tender	
13	Warranty	
14	EMD Amount and Payment details	
15	Bank Account No. with IFSC Code	
16	Any other remarks	
17	Signature of the Tenderer with Name and Date	
18	Address with Email ID & Mobile No.	
19	Central Public Procurement Portal (www.eprocure.gov.in) Registration, Email login ID	

- NB:** (1) The prices quoted and Taxes charged should be Academic/Educational Prices/rates, wherever applicable.
- (2) Enquiry for the above items and specifications can also be downloaded from our website <http://nielit.gov.in/calicut> or www.eprocure.gov.in
- (3) Please register at www.eprocure.gov.in and intimate login details without fail. Watch website for regular updates.

Handwritten signature and date: 24/8/20

ANNEXURE-II

Undertaking for EMD
(on the letterhead of Organization)

Date:

To

The Executive Director
NIELIT
NIT Campus P.O.
Kozhikode – 673601
Kerala

Subject: Undertaking as per GFR–2017, Rule 170(iii).

Dear Sir,

We, the undersigned, offer to supply in response to your Tender No. dated We are hereby submitting our Bid/Quotation for the same. As a part of eligibility requirement stipulated in the said Tender documents, we hereby submit a declaration in lieu of Earnest Money Deposit (EMD), as given below:

1. Our bid shall remain valid for 60 days from the date of submission and that we will not withdraw or modify our bid during the validity period.
2. In case, we are declared as successful bidder and an order is placed on us, we will submit the acceptance in writing within 7 days of placement of order on us.
3. In case, we are declared as successful bidder and an order is placed on us, we undertake, to submit a Security Deposit of 5% of the order value, as per terms stipulated in the Tender.
4. In case of failure on our part to comply with any of the above said requirements, we are aware that we shall be declared as ineligible for said Tender and/or debarred from any **future bidding process of NIELIT for a period of minimum two years.**
5. The undersigned is authorized to sign this undertaking.

Yours sincerely,

Authorized Signatory:

Name and Title of Signatory (with seal):

E-mail:

Mobile No:



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NIELIT

NIELIT, Calicut
Future skills Prime - ToT in 3DPAM
Bid form cum Scope of work

Name of the contact person with address:

Sl no	Description (Attach documentary evidences wherever applicable)	Complied (Yes/No) with details
1.	Year of establishment and number of years' experience in conducting online trainings in 3D Printing and related areas	
2.	Number of trainings conducted for Government organizations in 3D printing and no of candidates trained during last 2 financial years	
3.	Number of own training centres & 3D printing facilities and other infrastructure available	
4.	Details of Internet connectivity (no of connections, speed etc), platform used?	
5.	Affiliation/accreditation if any	
6.	Any other training conducted?	
7.	Are the programs aligned with NSQF	
8.	The training shall be conducted through online mode using suitable platform as per the course outline/syllabus attached.	
9.	The training should be interactive and engaging course to increase the value of the online student learning experience	
10.	List of participants shall be shared to successful tenderer by NIELIT, prior to start of the program	
11.	Starting Date : 14 th Sep 2020 onwards (tentative)	
12.	No of hours per day: 3-6 hours in one or two slots on mutual convenience (Monday to Friday between 9:30 AM to 5:15 PM)	
13.	The tenderer shall submit a detailed session wise time table with faculty name along with the tender. Specify how the course will be delivered like the learning / training platform, etc, along with the tender	
14.	The program should be conducted by qualified faculties. A detailed profile of faculties shall be attached along with the tender	
15.	Specify the modes of students interaction (student assignments, case studies, etc.,) during the online course along with the tender	
16.	The successful tenderer shall submit the soft/hard copy of course materials/tutorials before starting the program to NIELIT, Calicut	
17.	The successful tenderer shall submit a minimum of 150 Multiple choice questions (minimum 10 from each section) along with answers before starting the program to NIELIT, Calicut	
18.	The participation in the program should be monitored through suitable mechanism and an attendance report (day wise or session wise) shall be submitted to NIELIT, Calicut on completion of the program	
19.	The program should be offered only to registered participants as per the list shared by NIELIT, Calicut	
20.	The medium of language should be English	
21.	The tenderer must ensure that demos/tutorials should of high quality videos/animations	
22.	All technical queries related to subject must be answered either during the session or through email.	

Authorized signatory

*** Commercial quote to be attached in the format provided**

Sign of Authorized Signatory with Name & Seal

Course Details

Course Code:

FSP/01/2020/TOT001

Course
Name:

Training of Trainers in 3DPAM

Objective of the Course:

The Training of the Trainers program intended to cover

- Introduction to Additive Manufacturing
- Additive Manufacturing technologies
- CAD Modelling
- Reverse Engineering
- Design for AM
- Guidelines for Tools and Techniques for AM process selection
- Troubleshooting
- Post processing of AM parts
- AM Applications and Future Directions of AM

Learning Outcomes:

1. Explain how technology shifts throughout history have made 3D printing possible.
2. Acquire knowledge about important Additive Manufacturing processes used for the fabrication of prototypes and components
3. Apply engineering knowledge, techniques, skills and modern tools to analyze problems in AM.
4. Identify different industrial sectors, relevant AM processes and measurement techniques to reduce cost and time from design to manufacture.
5. Design and conduct experiments to understand process behavior for providing optimal solutions.
6. Develop and validate models to solve complex manufacturing problems using modern engineering and IT tools.
7. Discuss the economic implications of 3D printing including its impact on startup businesses and supply chains
8. Learn how to deal with holes, fine details, thin walls, adjusting for strength, moving parts and assemblies.
9. Learn the best practices to reduce material usage and ensure your parts are printed correctly.
10. Use the principles of Design Thinking and document their design process.
11. Navigate the CAD software being used for this course.
12. Apply the unique advantages of 3D printing to their designs.
13. Compare additive manufacturing to traditional technologies and choose the best technology for a given application.
14. Distinguish between various 3D printing technologies and materials and select appropriately for a given application.
15. Create smooth and detailed 3D models
16. Design systems with 3D printing technology in mind, including minimum tolerance and material thickness.
17. Printing the AM file on 3D printer and Post processing.
18. Acquire basic knowledge about the main opportunities provided by Reverse Engineering which represents an opportunity to learn how to conduct detailed product design by benefitting from cutting-edge technologies;
19. Be able to identify the advantages and limitations of Reverse Engineering
20. Understand various 3D Printer installation procedures
21. Safely connect all the cables and calibrate your 3D printer for perfect 3D prints
22. Get to know the different print materials and how to make multilateral objects
23. Troubleshoot and prevent printing problems with ease Trends and Future scope

Duration of the Course (in hours)

60 Hours (Theory: 48 Hours + Tutorial/Demo: 12 Hours)

Eligibility Criteria and pre-requisites, if any

Faculty members from Lead/Co-Lead/spokes/Participating institutes implementing FSPrime – 3DPAM

Course Outline/Syllabus

Topic	No. of Hours (Theory)	No of Hours (Demo/Tutorial)
Day 1		
Introduction to Additive Manufacturing <ul style="list-style-type: none"> • Introduction to the Basic Principles of Additive Manufacturing, • AM evolution, • Distinction between AM & CNC machining, • Advantages of AM, • Classification of AM & Various 3D printing technologies 	4	0
Additive Manufacturing technologies <ul style="list-style-type: none"> • VAT Polymerization, • Material jetting, Binder jetting, • Material extrusion, • Powder bed fusion, • Sheet lamination, and Direct energy deposition methods for metals, • Composites & Polymers and other materials 	5	1
Day 2		
CAD Modelling <ul style="list-style-type: none"> • Conceptualization • Creating support less designs • Optimizing for orientation • Achieving accuracy and fit, • Design guidelines for printing, • Designing Parts and assemblies • converting CAD model to AM file formats 	5	1
Day 3		
Reverse Engineering <ul style="list-style-type: none"> • Objectives and common application fields • Existing technologies, • Contact systems • Non-contact systems (3D Scanners, etc) 	5	1
Day 4		
Design for AM <ul style="list-style-type: none"> • Motivation, • DFMA concepts and objectives, • AM unique capabilities, Exploring design freedoms, • Design tools for AM, • Part Orientation, • Removal of Supports, • Hollowing out parts, • Inclusion of Undercuts and Other Manufacturing Constraining Features, • Interlocking Features, • Reduction of Part Count in an Assembly, • Identification of markings/numbers etc 	6	2

gm

gm

Day 5		
Guidelines for process selection <ul style="list-style-type: none"> • Introduction, • selection methods for a part, • challenges of selection & example system for preliminary selection, production planning and control, • Transfer to AM, STL & other AM files manipulation, • Machine setup, build, removal and clean up, • Slicing and post processing, • print settings and printing 	6	2
Day 6		
Tools and Techniques for AM <ul style="list-style-type: none"> • How a AM machine (VAT Polymerization, Material jetting, Binder jetting, Material extrusion, Powder bed fusion, Sheet lamination, Direct energy deposition) Works, • AM Overview & Work flow • Construction and operation of FDM, Metal Injection Molding (MIM), Material jetting machines (MJ & DOD), Binder jetting machines, Ultrasonic AM machines, DED machines, SLS, & PBF, • Tools and Parts & Mounting the parts, • Wiring the Power Supply, • Assembly of the Main Units, • Calibrating the Printer, • Software and communication, • Printer Setup and Printing parts with different design 	6	2
Day 7		
Printer Installation and Maintenance <ul style="list-style-type: none"> • Calibrating the Movements of the Printer, • Mount and Calibrate the Print Platform, • Print in 3D Filament and Printer Settings, • Print Settings First Layer, Dual Extrusion, • Operate the 3D Printer & 3d scanners 	3	1
Post processing of AM parts <ul style="list-style-type: none"> • Support material removal, • surface texture improvement, • accuracy improvement, • aesthetic improvement, • preparation for use as a pattern, • property enhancements using non-thermal and thermal techniques 	2	1
Day 8		
AM Applications <ul style="list-style-type: none"> • Functional models, • Pattern for investment and vacuum casting, • Medical models, art models, • Engineering analysis models, Rapid tooling, • new materials development, • Bi-metallic parts, Re-manufacturing. • AM Application examples for Aerospace, defense, automobile, Bio-medical and general engineering industries 	4	1

Future Directions of AM <ul style="list-style-type: none"> • Introduction, • new types of products & AM techniques and employment and digipreneurship 	2	0
Total	48	12

Recommended Hardware/tools:

- 3D printers of different technology (FDM, SLA, Multijetetc)
- 3D Scanners (White/Blue light)

Recommended Software:

- CAD/CAM/CAE software like CATIA, Siemens NX
- AM Software like Netfabb
- Reverse engineering & Inspection software
- Slicing software, OEM tools & Software

Learning Material / Books recommended for reference and reading:

The New world of 3D Printing – Hod Lipson
 Practical 3D printing – Brian Evans
 Rapid Prototyping: Principles And Applications, World Scientific Publishing Co. Pte. Ltd - Chua C. K., Leong K. F. and Lim C. S. (2010)
 Additive Manufacturing Technologies 3D Printing, Rapid Prototyping, and Direct Digital Manufacturing – Ian Gibson, David Rosen, BrentStucker

Delivery of Courses / Training Methodology:

Online with tutorials/demos