

National Workshop on Precision Measurements and Nanomechanical Testing

July 15-20, 2019



Organised by

Advanced Manufacturing Centre

Department of Mechanical Engineering, NIT Calicut, Kerala, India

in Association with

Bruker / Alicona & Millenia Technologies

Coordinators

Dr. Jose Mathew, Professor & Dr. Deepak Lawrence K, Assistant Professor, Dept. of Mechanical Engg., NIT Calicut

PREAMBLE

In science and engineering, objects of interest have to be characterized by measurement and testing. It is the process of experimentally obtaining quantity values that can reasonably be attributed to the property of a body or substance. Introduction of advanced materials and newer processing techniques forces manufacturing engineers/researchers to develop newer, efficient, cost effective measurements, testing and characterization methods. Precision measurements span applications in various fields, which include measurements of features, shapes of complex micro/nano components. Nanomechanical testing comprise in-situ topography imaging, nanomechanical characterization, stress relaxation characterization, evaluation of nanoindentation quantitative modulus, hardness, creep, fracture toughness, nanoscale measurement of scratch resistance, thin film adhesion, friction coefficients, wear rates, etc. To support the emerging micro/nano manufacturing industries, knowledge of advances in the micro/nano characterization and precision measurement is very much essential. Moreover, precise and accurate measurement techniques play an important role in improving the quality of research in advanced macro/micro/nano machining. Mechanical Engineering Department of NIT Calicut has recently established a DST-FIST centre for Precision Measurements and Nanomechanical Testing at a cost of Rs 2.51 Crore. This workshop is designed to provide an insight about the facilities acquired and to give exposure to the latest advancements in these areas.

COURSE OVERVIEW

The 6-day workshop is designed to provide state-of-the-art trends and advances in the precision measurements and nanomechanical testing. The will comprise both theory and practical sessions. During the workshop, sophisticated facilities acquired through DST-FIST and other equipments available at Advanced Manufacturing Centre will be demonstrated. The major instruments include Nanoindenter (TI Premier- Hysitron/Bruker), 3D Profilometer (InfiniteFocus G5- Alicona/Bruker), 5 axis CNC CMM (Mitutoyo), etc. For more details of facilities available, Please visit <http://amc.nitc.ac.in/>.

The programme will cover the following major topics;

- Micro/Nanoindentation, SPM techniques
- Measurement of physical and mechanical properties at the micro-nanoscale
- Nanotribology
- Factors influencing the structure-property-processing-performance correlation of metallic materials and alloys
- Micro/nano metrology, Precision optical metrology
- Optical profilometers for measurement and evaluation of 3-D surface topography
- 3D parameters and filtering techniques
- Spectral analysis of surface roughness
- Measurement of form errors using CNC CMM, Form Testing, Articulated CMM, and Laser scanning
- Uncertainty quantification: principles and methods as per ISO standards
- Research advances in precision micro/nano machining and measurements

RESOURCE PERSONS

Experts from academia and industries will be delivering lectures during the workshop. Eminent speakers include, Dr. Satish Kailas, Professor, Mechanical Engineering Department, IISc Bangalore, Dr. Ramesh Singh, Professor, Mechanical Engineering, IIT Bombay, Dr. Syed Asif, Director of R&D and Engineering, M/s Bruker Nano Surfaces Division, Dr. R. Balasubramaniam, Head, Precision Machining Section, BARC & Professor, Homi Bhabha National Institute, Mumbai, Dr RamaGopal V Sarepaka, Chief Scientist (Retd.), CSIR-Central Scientific Instruments Organisation, Chandigarh & Sr. Vice President ,OPTICA, Bengaluru, Mr. Antony Joseph, Outstanding Scientist & Programme Director, ANS, DRDL, Hyderabad and Technical experts from M/s Bruker, M/s Alicona/ Bruker and M/s Millenia Technologies.

WHO CAN ATTEND?

- Students at all levels (B.Tech. / M.Tech. / Ph.D., in Mechanical/Production Engineering and allied areas)
- Faculty from reputed academic institutions and technical institutions with aptitude for doing continuous research in these areas
- Executives, engineers and researchers from government organizations/industries, including R&D organizations

ABOUT NIT CALICUT

National Institute of Technology Calicut (NITC) is one of the 31 institutions of national importance governed by the NIT Act 2007 and is fully funded by the Government of India. Originally established in 1961 as a Regional Engineering College (REC), it was transformed into a National Institute of Technology in the year 2002.

The institute offers bachelors, masters and doctoral degree programmes in Engineering, Science, Technology and Management. With its proactive collaborations with a multitude of research organizations, academic institutions and industries, the institute has set a new style for its functioning under the NIT regime. The Institute is presently offering eleven UG programme and thirty PG programme along with Ph.D. programme in various fields of Engineering, Science Technology and Management; <http://www.nitc.ac.in>

ABOUT MED AND ADVANCED MANUFACTURING FACILITIES@ NITCALICUT

Department of Mechanical Engineering is the largest and one of the oldest departments in the Institute. It offers two undergraduate and six postgraduate programmes apart from Ph.D. programmes in diverse specializations. It also offers a number of short term/continuing education programmes. It is a DST- FIST sponsored department and recently DST has sanctioned Rs 2.51 Crore under FIST scheme to set up a Centre for Precision Measurements and Nanomechanical Testing. Advanced Manufacturing Centre in the department is one of the finest facilities available in manufacturing. The major equipments available include, 3D Optical Profilometer, Nanoindenter, 3 axis Integrated Multipurpose Micro Machining Centre, 5 axis CNC Coordinate Measuring Machine, CNC Machining Centres, CNC EDM Machines, Additive Manufacturing Machines, High Speed Camera, Thermal Imager, Six component and Mini Dynamometers, etc. A fully fledged CAD/CAM Centre with a dozen of popular industry relevant software is working round the clock. Metrology Laboratory with the state of the art facilities is also available. For more details; <http://amc.nitc.ac.in/>

ADDRESS FOR CORRESPONDENCE

Dr. Jose Mathew
Professor & Coordinator
 National Workshop on
 Precision Measurements and Nanomechanical Testing
 Department of Mechanical Engineering
 National Institute of Technology Calicut
 NIT Campus P.O., Kozhikode- 673601, Kerala, India

Phone: +919447416639, +914952286405;

Email: josmat@nitc.ac.in

<http://www.nitc.ac.in/index.php?url=users/view/190/12/3>

**REGISTRATION PROCESS**

The duly filled up registration form and the DD/ NEFT/RTGS receipt must be sent to the course coordinator. The DD/ Receipt of NEFT/RTGS and the original registration form (hard copy) must reach the coordinator on or before July 01, 2019. The maximum number of participants of the program would be limited to 50.

MODE OF PAYMENT

Participants have to remit the necessary course fee to the bank as per the details given below (inclusive of GST).

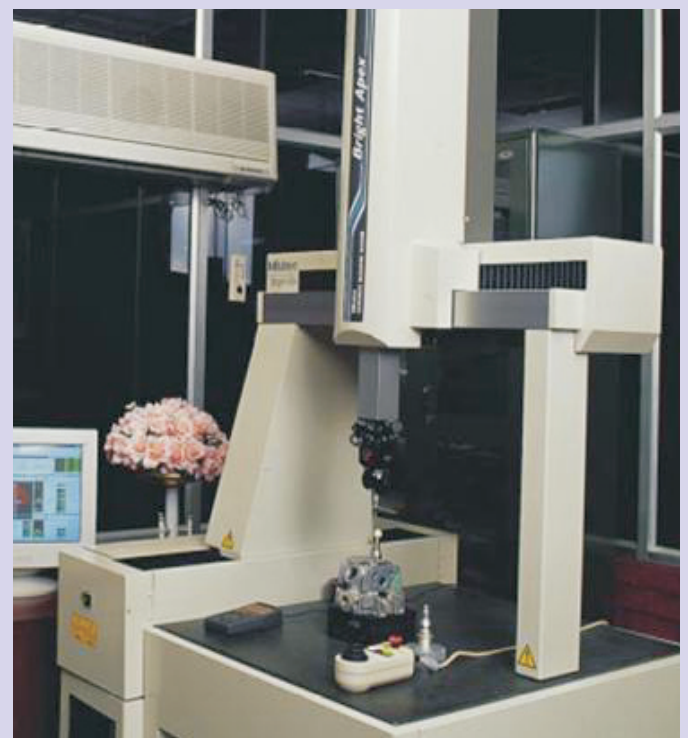
Participants from Abroad	: 300 USD
Participants from India	
Industry/Research Organizations	: 10000 INR
Faculty from Academic Institutions	: 8000 INR
Research Scholars/Students (getting stipend)	: 4000 INR
Students (not getting stipend)	: 1500 INR
Account Name	: DIRECTOR NIT CALICUT
Account No.	: 37618269594
Bank	: State Bank of India
Branch	: CREC, Chathamangalam Kozhikode-673601
BranchCode	: 002207
IFSC	: SBIN0002207
MICRCode	: 673002012
SWIFTCode	: SBINPNBB392

For any queries, please contact the coordinator.

The above fee includes the cost of instructional materials, use of internet facility, refreshments and working lunch. Accommodation for outstation participants will be charged separately. No TA/DA will be paid for any participant.

IMPORTANT DATES

- Last date for receiving applications : July 01, 2019
- Last date for Intimation to participants by email : July 02, 2019
- Course dates : July 15-20, 2019





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July 15-20, 2019

Registration Form

Name: ☐ M ☐ F

Designation:.....

Highest Qualification & Specialization:

Programme and Semester: (students)

Organization.....

Address:.....

.....

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Mobile No: Email:

Your current research/ ongoing project

.....

Details of Payment of Registration Fee. *(No return of the payment, once it is made).*

DD No.....DateBank Amount.....

If paid through NEFT/RTGS

Transaction Number Date Bank

Accommodation Required: Yes/ No

Date

Signature of the Applicant.....

Please Send to:

Dr. Jose Mathew

Professor & Coordinator

National Workshop on

Precision Measurements and Nanomechanical Testing

Department of Mechanical Engineering

National Institute of Technology Calicut

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APPROVAL FROM AFFILIATED INSTITUTE OF THE APPLICANT

Certified that Mr./ Ms./ Dr.

is an employee/student of our institute. If selected, he/she will be permitted to attend the **National Workshop on Precision Measurements and Nanomechanical Testing** conducted by NIT Calicut during July 15-20, 2019.

Date:

Signature

and Seal of Approving Authority