



Vol. 1, No.1
(July-December 2019)

MECHNEWS

NITC

Bi-Annual Newsletter, Department of Mechanical Engineering
NIT Calicut, Kerala

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Director's Message

I am happy to know that the first issue for July-December 2019 of MECHNEWS, the Newsletter of Mechanical Engineering Department of NIT Calicut, is soon to be launched.

In this context, I would like to mention that a departmental newsletter is an effective communication tool for faculty, staff, students and alumni of the department. Since a department is made up of people and others are usually interested in knowing about the departmental activities, a newsletter is very much welcome. The newsletter gives the departmental stakeholders consistent and appropriate talking points that they can share with their families, friends and social circles, helping generate positive word-of-mouth for the department. In the process, the newsletter can breakdown barriers between the stakeholders, especially at large departments.

In an eclectic sense, the departmental newsletter keeps everyone involved, creates a sense of belonging, creates a sense of appreciation, is a great way to discuss goals and describes the departmental culture. In a nutshell, departmental newsletter is perfect for setting the right tone for the department.

In view of the above, I congratulate the Head of the Department, Newsletter Editor and the Editorial Board members, who have worked hard to bring out this newsletter.

I look forward to more editions of this newsletter in future.

With warm greetings,
Sivaji Chakravorti
Director, NIT Calicut



Chairman's Message

New Year Greetings! I am very glad to welcome you to the first issue of MECHNEWS, the Newsletter of the Department of Mechanical Engineering, NIT Calicut. I would like to take this opportunity to briefly outline the purpose of MECHNEWS as I see them. First and foremost, the aim of MECHNEWS is to disseminate information on the professional activities of faculty, students, alumni and staff members of the Department of Mechanical Engineering, NIT Calicut. MECHNEWS is intended to be a collaborative effort. I hope MECHNEWS will help to promote active interaction among the stakeholders of the Department. I appreciate the sincere efforts taken by the editorial board under the leadership of Prof. R. Sridharan and wish all the best for this good venture. In closing, I seek the whole-hearted cooperation of all Mechanical Engineering Department faculty, students, alumni and staff members in achieving the Department's vision and mission.

With Best Wishes,
Dr. Jose Mathew

**NATIONAL INSTITUTE OF TECHNOLOGY
CALICUT**

DEPARTMENT OF MECHANICAL ENGINEERING



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EDITORIAL

It is indeed a great honour to be the Chief Editor for the MECHNEWS and it is an immense pleasure to launch this very first edition. In this issue, we are recounting the various programs and projects in which faculty, students, alumni and staff members of the Department of Mechanical Engineering, NIT Calicut were actively involved during July - December 2019. A huge thanks to all the persons who have contributed to this issue of the Newsletter. I would like to thank Dr. Jose Mathew, Professor and Head, Department of Mechanical Engineering and the editorial board for their everlasting support throughout the creation of this edition. If you have any questions, comments, concerns or suggestions, I'd love to hear them, please mail me.

Happy reading!
Dr. R. Sridharan

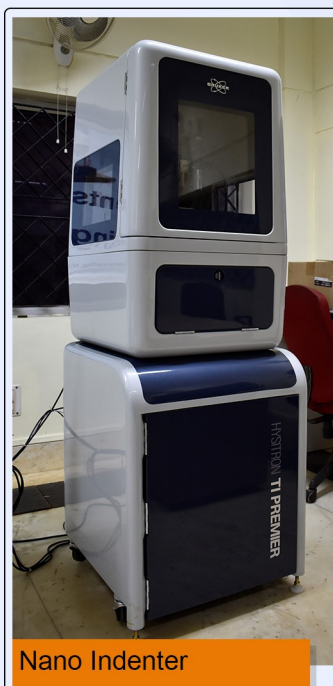
Highlights

- Dr. Jose Mathew took over the position as 'Head of the Department of Mechanical Engineering' on July 22, 2019.
- The Department conducted Orientation Programme for B. Tech. students on 24th July 2019 and M. Tech. students & Research scholars on July 31, 2019.
- Department level PTA meeting was conducted on October 26, 2019 for the first year B Tech. students of the 2019-20 admission.
- The Head of the Department and the Faculty members briefed the students of B. Tech. and M. Tech. programmes of the Department during October 28-31, 2019 about the elective courses to be offered in the Winter Semester 2019-20.
- The Department submitted the Self Assessment Report for NBA accreditation of 'Energy Engineering and Management (M.Tech.)' and 'Production Engineering (B.Tech.)' in December 2019.

DST-FIST

Dr. Jose Mathew presented the progress of the project under "DST-FIST Program in Engineering & Technological Sciences" on November 11, 2019 at International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI) Cell, Gurgaon-Haryana.

Following are the machines at DST- FIST Centre for Precision Measurements & Nanomechanical Testing



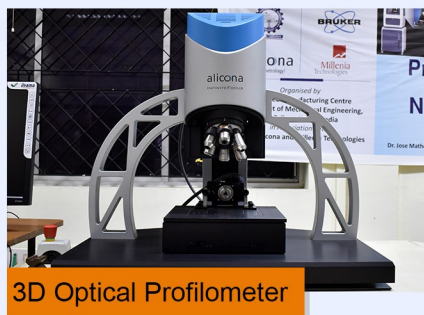
Nano Indenter



Thermal Imager



High speed camera



3D Optical Profilometer

Paper Publications

- Ambika, P. S., Rajendrakumar, P. K., & Ramchand, R. (2019). Vibration signal based condition monitoring of mechanical equipment with scattering transform. *Journal of Mechanical Science and Technology*, 33 (7), 3095-3103.
- Arun, K. R., Srinivas, M., Saleel, C. A., & Jayaraj, S. (2019). Active drying of unripened bananas (*Musa Nendra*) in a multi-tray mixed-mode solar cabinet dryer with backup energy storage. *Solar Energy*, 188, 1002-1012.
- Dilshad T. T., Shebeer A. R., & Hanas T. (2019). Polyvinyl Alcohol/Magnesium Phosphate composite coated Mg-Ca alloy for biodegradable orthopaedic implant applications. *Materials Research Express*, 6 (11), 1165b7.
- Emmatty, F. J., & Panicker, V. V. (2019). Ergonomic interventions among waste collection workers: A systematic review. *International Journal of Industrial Ergonomics*, 72, 158-172.
- Farook, N. U., Parthasarathy, R., Murshid, P. K., Rathod, A. K., Krishnan, S. N. R., Verma, A. K., & Sreenath, A. M. (2019). A novel methodology to optimize design parameters of an asymmetric gear. *IOP Conference Series: Materials Science and Engineering*, 624 (1), 012016.
- George, J., Manu, R., & Mathew, J. (2019). Multi-objective optimization of roundness, cylindricity and areal surface roughness of Inconel 825 using TLBO method in wire electrical discharge turning (WEDT) process. *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, 41 (9), 377.
- Karthick, K., Suresh, S., Hussain, M. M. M., Ali, H. M., & Kumar, C. S. (2019). Evaluation of solar thermal system configurations for thermoelectric generator applications: A critical review. *Solar Energy*, 188, 111-142.
- Kuan, M., Shakir, Y., Mohanraj, M., Belyayev, Y., Jayaraj, S., & Kaltayev, A. (2019). Numerical simulation of a heat pump assisted solar dryer for continental climates. *Renewable Energy*, 143, 214-225.
- Mandhare, N. A., Karunamurthy, K., & Ismail, S. (2019). Compendious review on "Internal flow physics and minimization of flow instabilities through design modifications in a centrifugal pump". *Journal of Pressure Vessel Technology*, 141 (5), 051601.
- Mubarak, M., Shaija, A., & Suchithra, T. V. (2019). Flocculation: An effective way to harvest microalgae for biodiesel production. *Journal of Environmental Chemical Engineering*, 7 (4), 103221.
- Nithin Raj P, Sekar, K., & Joseph, M. A. (2019). Effect of temperature on microstructure evolution and localized corrosion resistance of high tungsten hyper duplex stainless steel. *Materials Research Express*, 6 (11), 116557.
- Philip, J. T., Kumar, D., Mathew, J., & Kuriachen, B. (2019). Wear characteristic evaluation of electrical discharge machined Ti6Al4V surfaces at dry sliding conditions. *Transactions of the Indian Institute of Metals*, 72 (10), 2839-2849.
- Prasad, V., Sekar, K., Varghese, S., & Joseph, M. A. (2019). Enhancing mode I and mode II interlaminar fracture toughness of flax fibre reinforced epoxy composites with nano TiO₂. *Composites Part A: Applied Science and Manufacturing*, 124, 105505.
- Sabarinath, S., Rajeev, S. P., Kumar, P. R., & Nair, K. P. (2019). Development of fully formulated eco-friendly nanolubricant from Sesame oil. *Applied Nanoscience*, 1-10.
- Sajeeb, A., & Rajendrakumar, P. K. (2019). Comparative evaluation of lubricant properties of biodegradable blend of coconut and mustard oil. *Journal of Cleaner Production*, 240, 118-255.
- Sumesh, C. K., & Sarvoththama Jothi, T. J. (2019). Aerodynamic noise characteristics of a thin airfoil with line distribution of holes adjacent to the trailing edge. *International Journal of Aeroacoustics*, 18 (4-5), 496-516.
- S Rajesh Kana & A. Shaija (2019). Performance, combustion and emission characteristics of Diesel engine using waste Avocado biodiesel with Manganese doped Alumina nanoparticles, *International Journal of Ambient Energy*, 1-33.
- Vishnu, C. R., Sridharan, R., Kumar, P. N., & Kumar, V. R. (2019). Analysis of the operational risk factors in public hospitals in an Indian state. *International Journal of Health Care Quality Assurance*, 33 (1), 67-88.
- Vishnu, C. R., Sridharan, R., Gunasekaran, A., & Kumar, P. R. (2019). Strategic capabilities for managing risks in supply chains: current state and research futurities. *Journal of Advances in Management Research*. DOI 10.1108/JAMR-04-2019-0061.
- Viswanath A, Krishnan KN, Murali KP (2019). Preparation and characterization of Ba₄Co₂Fe₃₆O₆₀ filled PP composites. *IOP Conference Series: Materials Science and Engineering*, 577 (1), 012141.

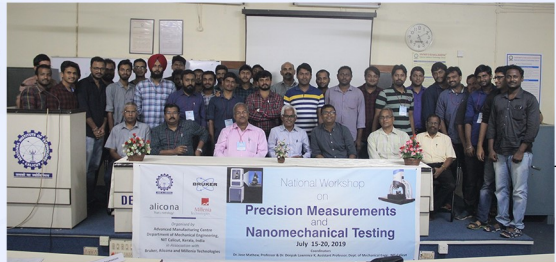
Workshops/FDPs/Conferences/Seminars/GIAN Courses

- Dr. Jagadeesha T and Dr. K Sekar conducted the TEQIP III Sponsored FDP on "**Advances in Industrial Automation Fluid Power Control Technologies**" jointly with GEC Bharatpur during July 1-6, 2019.
- Dr. Sujith Kumar C S and Dr. Srinu Gangolu organised the TEQIP III Sponsored FDP on "**Advanced Materials for Solar Systems**" jointly with GEC Bharatpur during July 8-12, 2019.

FDP on Recent Advances in Solar Systems (2019)



- Dr. Jose Mathew and Dr. Deepak Lawrence K conducted a National Workshop on "**Precision Measurements and Nanomechanical Testing**" in association with Bruker/ Alicona & Millenia Technologies during July 15-20, 2019.



- Dr. Simon Peter and Dr. Saleel Ismail conducted the TEQIP III Sponsored FDP on "**The Art of Teaching and Learning Engineering Graphics**" during December 30, 2019 to January 3, 2020.



Awards and Honours

- B. Tech. students (O V S Praveen, B Dileep, N Venkatasai, D Gayatri, E Sandeep and Hari Kishore) of batch 2015-19 of Mechanical Engineering, under the guidance of Dr. R Manu and Dr. Deepak Lawrence K, bagged the **Society of Aerospace Manufacturing Engineers (SAME)** award for the Best UG Project in Manufacturing Engineering area on December 6, 2019.



- Prof. Roshan Joseph (NITC Alumnus, 1993, Production Engineering and Management), faculty of Georgia Tech, was elected as **Chief Editor** of the prestigious **International Journal of ASQ and ASA, Technometrics**.



Sponsored Research and Development Projects

Title of the Project	Investigators	Sponsoring agency	Amount (Rs.) Sanctioned date & Duration
Development of desalination system using selectively patterned solar absorber	Dr. Sujith Kumar C.S. and Dr. S. Jayaraj	Directorate of environment & climate change	13,75,000/- 30/10/2019 2 years (2019-21)
Selectively patterned porous evaporative structure for enhanced solar driven interfacial evaporation	Dr. S. Jayaraj and Mr Inbaoli	The Institution of Engineers	1,00,000/- 06/08/2019 2 years (2019-21)
Control of instabilities in Jeffcott Rotor	Dr. Ashesh Saha	DST-SERB	23,83,554/- 29/10/2019 2 years (2019-21)
Development of kitchen layout for paraplegic persons	Dr. Ratna Kumar Kondareddy	DST-SERB	26,75,120/- 27/12/2019 3 years (2019-22)
Development of wear resistant nano-coatings for nuclear/space applications by simulation studies	Dr. Jayadeep U B and Mr. Aju Zachariah Mani	KSCSTE (TDAP scheme)	7,00,000/-
Assessment of occupational hazards for worker well-being under clean India Initiative	Dr. Vinay V Panicker and Mr. Francis J. Emmatty	Indian Council for Social Science Research-IMPRESS	7,35,000/- 17/09/2019 1 year (2019-20)
Development of a decision support system for multimodal freight transportation planning with a special application for FCI Kerala Region	Dr. Vinay V. Panicker and Mr. Anoop K.P.	KSCSTE-TDAP	3,00,000/- 20/06/2019 1 year (2019-20)
Experimental investigation and electro thermal modelling of electrode wear compensation in Micro Electric Discharge Machining (μ EDM) of shaped holes on super alloys for improving the dimensional accuracy and functional performance of cooling holes on turbine blades and vanes	Dr. Basil Kuriachen, NIT Mizoram and Dr. Jose Mathew, NIT Calicut	DRDO	17,17,400/- 06/11/2019 2 years (2019-21)

Professional Body Activities

Mechanical Engineering Association (MEA)

- The **CAD-CAM Centre** of the Department in collaboration with the Mechanical Engineering Association (MEA) organized free training programs on various CAD-CAM software packages such as SOLIDWORKS, CREO, CATIA, SIEMENS NX, ANSYS, ABAQUS, MSC ADAMS and MASTERCAM during the period August 5 - October 31, 2019.



- Dr. Ramadhas A S, Senior Research Manager, R&D centre, Indian Oil Corporation Ltd, Faridabad, delivered a lecture entitled “**Future Prospects of Mechanical Engineers in the Automobile Industry**” on July 30, 2019.



Indian Institution of Industrial Engineering (IIIE) Kozhikode Chapter

- IIIE Kozhikode Chapter celebrated Teachers' Day and organized a research lecture entitled “**Reading a Research Paper Critically and Creatively**” on September 5, 2019 by Dr. R. Sridharan.



- Sri Vishnu C R, research scholar under MED, delivered a lecture entitled “**Systematic Review of Scientific Literature**” organized by IIIE Kozhikode Chapter on the occasion to celebrate the Engineers' Day on September 18, 2019.



Student Internships at Foreign Universities

- Mr. Vikas Badami (B160906PE), a student of VI Semester B. Tech. Production Engineering had undergone Internship at Pi School in Rome, Italy during October - December 2019 for a duration of eight weeks.
- Mr. Battu Anudeep (M190432ME), a student of I Semester M. Tech. Industrial Engineering and Management had undergone Internship on “Data Analytics using Deep Learning” at Strategic Technology Management Institute, School of Computing, National University of Singapore during December 14, 2019 - January 4, 2020.

Ph.D. Thesis Defended

- Mr. Joel George defended his Ph.D. thesis entitled “Investigation on valorization of lignocellulosic Biomass through fluidised bed gasification” under the guidance of Dr. Arun P and Dr. C Muraleedharan on July 3, 2019.
- Mr. Rajesh T N defended his Ph.D. thesis entitled “Flow and thermal characteristics of the Vortex cooled combustion chamber of rocket engine under non-reacting and reacting conditions” under the guidance of Dr. T J S Jothi on August 26, 2019.
- Mr. Jabir E defended his Ph.D. thesis entitled “Mathematical models and meta-heuristics for capacitated green vehicle routine problems: development and analysis” under the guidance of Dr. R Sridharan and Dr. Vinay V Panicker on September 02, 2019.
- Mr. Deepak G Dilip defended his Ph.D. thesis entitled “Modeling and experimental investigations of micro electric discharge machining on Inconel 718” under the guidance of Dr. Jose Mathew and Dr. Satyananda Panda on September 9, 2019.
- Ms. Shruthi C M defended her Ph.D. thesis entitled “Development of robot mechanism for traversing electrical mechanism lines on tension and suspension towers” under the guidance of Dr. M L Joy and Dr. A P Sudheer on September 14, 2019.
- Mr. Vipindas defended his Ph.D. thesis entitled “Modeling and experimental investigation on micro-end milling process for Ti-6Al-4V alloy” under the guidance of Dr. Jose Mathew on September 17, 2019.

Outreach Activities

Academic Outreach

- Dr. R. Sridharan delivered an Invited Lecture entitled “**Reading Research Papers Critically and Creatively**” in the Department of Industrial Engineering, Anna University, Chennai on September 10, 2019.



- Dr. V Madhusudanan Pillai conducted a workshop on “**Supply Chain Management Simulation**” at Vimal Jyothi Engineering College, Chemperi, Kannur on November 2, 2019.



- Dr. R. Sridharan delivered an Invited Lecture entitled “**Research Problem: Identification and Formulation**” in the One-day Workshop on Research Methodology for the M.Sc. students of Computer Science, Statistics, and Mathematics at Farook College, Calicut on December 9, 2019.
- Dr. Vineesh K P delivered an Invited Lecture entitled “**Numerical modeling of thermo- mechanical processes - Case study of railway wheels**” in the Short Term Course on Recent Trends in Friction Stir Processing Techniques (RTFSP2019) organized by the Department of Mechanical Engineering, Indian Institute of Technology Patna during December 18 - 20, 2019.
- Dr. R. Sridharan was the **Chief Guest** for the Graduation and Course Completion ceremony at Eranad Knowledge City Technical Campus, Manjeri on December 21, 2019.

Social Outreach

- Dr. Simon Peter coordinated the activities of arranging financial contribution from NITC community in September 2019 towards the medical treatment of Mr. Dhanurjaya Durga, an employee of the COOPS Juice Centre, Mini Canteen, NIT Calicut.

Recap of Awards/Honours during the academic year 2018-19

- Rahul Karumuri and Shashank Kappagalmath (B.Tech. PE:2015-19) under the guidance of Dr. Vinay V. Panicker received the **Springer Nature Young Researcher Award (First Prize) in the Undergraduate category** at the 16th International Conference on “Humanizing Work and Work Environment” (HWWE) 2018, during December 14-16, 2018, Thiruvananthapuram.



- Baradwaj K C (M.Tech. IE&M:2017-19) under the guidance of Dr. Vinay V. Panicker received the **Springer Nature Young Researcher Award (Second Prize) in the Postgraduate category** at the 16th International Conference on “Humanizing Work and Work Environment” (HWWE), during December 14-16, 2018, Thiruvananthapuram.



Upcoming Events

- National Workshop on “**3D Printing Solutions for Medical Innovation (3DPSMI-2020)**” during June 6-7, 2020 at MVR Cancer Centre and Research Institute Calicut organised by the Mechanical Engineering Department & FABLAB,TBI NIT Calicut in collaboration with MVR Cancer Centre and Research Institute Calicut.
- Dr. S S Gokhale, Former Director, NITC and Smt. Beena Gokhale will be visiting the institute and interact with faculty, research scholars and students during March 11 - 12, 2020.
Dr. S S Gokhale will be presenting sessions on the topics entitled “**21st Century Technical Teacher**” (for Faculty) and “**Essence of Aerospace Engineering**”(for B. Tech. Students).
Smt. Beena Gokhale will be presenting sessions on the topics entitled “**Objectives of Pedagogy**” (for Faculty) and “**Communication and Technical Writing**” (for Research Scholars).

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