



MECHNEWS

NITC

Newsletter, Department of Mechanical Engineering
NIT Calicut, Kerala

Editor-in-chief's message



"I am very happy to release the Second Issue of MECHNEWS. In this issue, we recapitulate the programs and projects in which faculty, students and alumni of the Department of Mechanical Engineering, NIT Calicut were actively involved during January – December 2020. I thank the editorial board members for their support and suggestions. Special thanks to student-editors for their help in bringing out this issue of the newsletter. Suggestions to improve the content and presentation are most welcome."

Happy reading!
Dr. R. Sridharan

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DEPARTMENT OF MECHANICAL ENGINEERING



तमसो मा ज्योतिर्गमय

Conference Publications

- Bernard, A., and Varaprasad, G. A Review on Risk Assessment Tools for Drilling Operations in Oil Rigs. Proceedings of the International Conference on Industrial and Manufacturing Systems (CIMS-2020), October 9-11, 2020, organized by Department of Industrial & Production Engineering, Dr B R Ambedkar National Institute of Technology Jalandhar, Punjab.
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- Dwivedi, P. D., Das, P., Bhalerao, H. V., Samsani, S., Balyan, S., Vadlamudi, Y., Ismail, S., and Feroskhan, M. Effect of diesel-DEE blending on performance and emission characteristics of a biogas fuelled dual fuel engine. International Conference on Innovations in Thermo-Fluid Engineering and Sciences (ICITFES – 2020), February 2020, NIT Rourkela.
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- Feroskhan, M., Ismail, S., and Panchal, S. H. Study of methane enrichment in a biogas fueled HCCI engine. 12th International Exergy, Energy, and Environment Symposium, December 2020, Hamad Bin Khalifa University, Qatar.
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- Koltharkar, P., Eldhose, K. K. and Sridharan, R. Application of fuzzy TOPSIS for the prioritization of students' requirements in higher education institutions: a case study IEEE ICSCAN 2020 - 3rd International Conference on Systems, Computation, Automation and Networking, Manakula Vinayagar Institute of Technology, Puducherry, July 3-4, 2020.
- Kumar, A., Eldhose, K. K., Sridharan, R. and Panicker, V.V. Students' academic performance prediction using regression: a case study, IEEE ICSCAN 2020 - 3rd International Conference on Systems, Computation, Automation and Networking, Manakula Vinayagar Institute of Technology, Puducherry, July 3-4, 2020.
- Kumar, R., Mathew, N., and Varaprasad, G. A review on factors affecting adoption of Electric Vehicles. Fifth International Joint Colloquiums on Computer Electronics Electrical Mechanical and Civil – CEMC, 30th November – 3rd December, 2020.
- Kumbhar, V., Lal, V., and Varaprasad, G. A study on the unified theory of acceptance and use of technology as an adoption framework. Fifth International Joint Colloquiums on Computer Electronics Electrical Mechanical and Civil – CEMC, 30th November - 3rd December, 2020.
- Lokesh, Samanta, A. K., and Varaprasad, G. A Comprehensive insight into lean six sigma in healthcare sector: A systematic literature review. Proceedings of the International Conference on Industrial and Manufacturing Systems (CIMS-2020), October 9-11,2020, organized by Department of Industrial & Production Engineering, Dr B R Ambedkar National Institute of Technology Jalandhar, Punjab.
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- Mathew, N., and Varaprasad, G. Factors influencing the development and deployment of charging stations for electric vehicles in India. Proceedings of the International Conference on Industrial and Manufacturing Systems (CIMS-2020), October 9-11,2020, organized by Department of Industrial & Production Engineering, Dr B R Ambedkar National Institute of Technology Jalandhar, Punjab.
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- Pandey, A., Akhil, V.M., and Jayadeep, U. B. Artificial neural network-based load prediction using stress-stiffening effect. 4th International Conference on Trends in Electronics and Informatics [ICOEI 2020], April 16-18, 2020, SCAD College of Engineering and Technology, Tirunelveli, India.
- Prasad, A., Kurup, A., Jishnu, K., Abhisek, G., Samanta, A. K., and Varaprasad, G. Lean Six Sigma solutions for quality improvement in healthcare sector: a systematic review. Proceedings of the 3rd International conference on Systems, Computation, Automation and Networking (Sponsored by IEEE Madras Section) (ICSCAN), July 3-4,2020, Manakula Vinayagar Institute of Technology, Puducherry.
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- Raj, A.K., Srinivas, M., and Jayaraj, S. Macro-Encapsulation of PCM Integrated with Double-Pass Solar Air (2020). Advances in Energy Research, Vol. 2: Selected Papers from ICAER 2017, 2, p.181.
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- Syed, A. A., Varaprasad, G., and Irshadul Islam, C. A. Identifying Opportunities for Implementing Lean Manufacturing in Indian SMEs in the Furniture Industry. Proceedings of the International Conference on Industrial and Manufacturing Systems (CIMS-2020), October 9-11, 2020, organized by Department of Industrial & Production Engineering, Dr B R Ambedkar National Institute of Technology Jalandhar, Punjab.
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- Dileep, K., Raj, A., Dishnu, D., Saleel, A., Srinivas, M. and Jayaraj, S. Computational fluid dynamics analysis on solar water heater: Role of thermal stratification and mixing on dynamic mode of operation. *Thermal Science* 2020, 24(2 Part B), pp.1461-1472.
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- Pandey, A., Akhil, V.M., and Jayadeep, U. B. Artificial neural network-based load prediction using stress-stiffening effect. 4th International Conference on Trends in Electronics and Informatics [ICOEI 2020], April 16-18, 2020, SCAD College of Engineering and Technology, Tirunelveli, India.
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- Sreekumar, S., Joseph, A., Sujith Kumar, C. S., and Thomas, S. Synthesis, Characterization and Optimization of Full- spectrum Concentrated ATO/Ag Hybrid for Experimental Investigation of nanofluid based Parabolic Trough Direct Absorption Solar Collector (PTDASC). *Journal of Cleaner Production* 2020, 249, 119378.
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- George, J., Ravi Chandan G., Manu, R., and Mathew, J. Modeling of Areal Surface Roughness Using Soft-Computing-Based ANN and GA to Estimate Optimal Process Parameters During Wire Electrical Discharge Turning of Inconel 825. In: Shunmugam M. S., Kanthababu M. (eds) *Advances in Unconventional Machining and Composites. Lecture Notes on Multidisciplinary Industrial Engineering* 2020. Springer, Singapore.
- Jose, C.M., Sudheer, A.P., and Narayanan, M.D. Modelling and Analysis of Seeding Robot for Row Crops. *Lecture Notes in Mechanical Engineering*, pp. 1003-1014.
- Kuriachen, B., and Mathew, J. Effect of μ EDM Milling Process Parameters on Surface Roughness During Machining Ti–6Al–4V. In: Biswal B., Sarkar B., Mahanta P. (eds) *Advances in Mechanical Engineering. Lecture Notes in Mechanical Engineering*. Springer 2020, Singapore. https://doi.org/10.1007/978-981-15-0124-1_37.
- Mallick, M.K., and Sudheer, A.P. Kinematic and Static Structural Analysis of a Humanoid with a Wheeled Mobile Base. *Lecture Notes in Mechanical Engineering*, pp. 991-1001.

Books/ Book Chapter Publications

- Philip, J.T., Kumar, D., Mathew, J., and Kuriachen B. (2020) Sliding Behavior of Secondary Phase SiC Embedded Alloyed Layer Doped Ti6Al4V Surfaces Ensuing Electro Discharge Machining. In: Itoh S., Shukla S. (eds) Advanced Surface Enhancement. INCASE 2019. Lecture Notes in Mechanical Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-15-0054-1_17.
- Philip, J.T., Kuriachen B., and Mathew, J. Factor Effect on Crater Shapes in Electrical Discharge Machining. In: Biswal B., Sarkar B., Mahanta P. (eds) Advances in Mechanical Engineering. Lecture Notes in Mechanical Engineering. Springer 2020, Singapore. https://doi.org/10.1007/978-981-15-0124-1_52.
- Philip, J.T., Kuriachen, B., and Mathew, J. Numerical Modelling and Simulation of Single and Multi-spark Impacts in Electrical Discharge Machining. In: Shunmugam M., Kanthababu M. (eds) Advances in Simulation, Product Design and Development. Lecture Notes on Multidisciplinary Industrial Engineering. Springer 2020, Singapore. https://doi.org/10.1007/978-981-32-9487-5_39.
- Rohith, K.K., Varma, N., Sudheer, A.P., and Joy, M.L. Mathematical Modeling and Comparative Study of 12-DoF Biped Robot Using Screw Theory and Denavit–Hartenberg Convention. Lecture Notes in Mechanical Engineering, pp. 979-989.

Patents and Copyrights

- Dr. Sudheer, A.P. Adjustable Bed for Physically Challenged, Patent Filed on 26-11-2020, Patent Application No. 202041051490
- Dr. Vinay V. Panicker, Multi-Utility Plogging Bag, Patent Filed on 20-11-2020. Patent Application No.202041050568.
- Dr. Sudheer, A.P. Automatic Book Returning System, Patent Filed on 28-10-2020, Patent Application No. 202041047027.
- Dr. Manu, R., and Deepak, L. K. Feature extraction and Fixture planning: FiXplan software. Status: Copyright with number: SW-14005/2020 dated 14-12-2020.
- Dr. Sudheer, A. P. Dynamic Head Load Redistributing Wearable Robot, Patent Filed on 28-11-2020, Patent Application No. 202041056655
- Dr. Sudheer, A. P. Radially Contracting Toroidal Pneumatic Artificial Muscle, Patent Filed on 28-10- 2020, Patent Application No. 202041047095.

Sponsored projects/fundings received

Title of the Project	Investigators	Sponsoring agency	Amount (Rs) Sanctioned date & duration
Development of Aluminum–Cerium–Scandium Alloys for High Temperature Creep Applications and its Experimental Investigations	Dr. Srinu Gangolu	Science & Engineering Research Board (SERB)	Rs. 34,77,400 sanctioned in 2020

Significant Professional Body Activities/Significant Outreach Activities

- Dr. Jose Mathew delivered an invited lecture entitled "Micro-Machining of Difficult to Machine Materials" in the Five-day e-Shot Term Course on Advanced Manufacturing Processes & Applications (AMPA-2020), organized by the Department of Mechanical Engineering, MNIT Jaipur, during August 24th - 28th 2020.
- Dr. Jose Mathew was an invited speaker in 'VIBHAV' under the vertical: V12H3 - Advanced Manufacturing Technologies, Precision/Micro Nano Manufacturing/ Surface Engineering, in the VAIshwik BHAratiya Vaigyanik Summit VAIBHAV, Global Summit of Overseas and Resident Indian Scientists and Academicians Oct-Nov 2020, by Government of India on 12th October 2020.

Significant Professional Body Activities/Significant Outreach Activities

- Dr. R. Sridharan delivered invited lectures on “Overview of Research Methodology” and “Research Writing” in the National Workshop on “Perspectives and Challenges in Outcome Based Research” under the aegis of AICTE-MARGDHARSHAN Scheme, NIT Trichy, during July 13-17, 2020.

PhD Thesis Defended

- Mr. Lokesh Paradeshi defended his Ph.D. thesis entitled “Analysis of a Solar Assisted Heat Pump System with Hydrocarbon Refrigerants Suitable for Heating Applications” under the guidance of Dr. S. Jayaraj and Dr. M. Srinivas on 09-03-2020.
- Mr. Sajeeb A.M defended his Ph.D. thesis entitled “Tribological Studies on Vegetable Oil Based Hybrid Nano-lubricants” under the guidance of Dr. P. K. Rajendrakumar on 20-05-2020.
- Mr. P. V. Manu defended his Ph.D. thesis entitled “Investigations on a CI Engine Operated with Oxy-Hydrogen Gas” under the guidance of Dr. S. Jayaraj and Dr. A. Ramaraju on 27-05-2020.
- Mr. Anoop K P defended his Ph.D. thesis entitled “Models and methods for freight transportation planning in a food grain supply chain” under the guidance of Dr. VINAY V. PANICKER on 03-06-2020.
- Mr. Premchand V P defended his Ph.D. thesis entitled “Development of a cluster-based algorithm in design optimization of nonlinear dynamical systems” under the guidance of Dr. M.D. Narayanan and Dr. Sajith A.S. on 04-06-2020.
- Mr. Sajith K.G defended his Ph.D. thesis entitled “Theoretical modelling and experimental studies to predict the Performance of a Solar Hybrid Photovoltaic-Thermal system” under the guidance of Dr. C. Muraleedharan on 06-07-2020.
- Mr. Sreejith B J defended his Ph.D. thesis entitled “Modelling and analysis of multi-echelon supply chains for deteriorating products” under the guidance of T. Radharamanan on 23-07-2020.
- Mr. Solomon Joseph defended his Ph.D. thesis entitled “Mathematical Models and Meta-Heuristic Algorithms for Cross Dock Transportation Problem Associated with Fixed Charge” under the guidance of Dr. R. Sridharan on 24-07-2020.
- Mr. Dileep K defended his Ph.D. thesis entitled “Investigations on the domestic solar water heaters with latent heat thermal energy storage system” under the guidance of Dr. S. Jayaraj and Dr. M. Srinivas on 21-08-2020.
- Mr. Arun K Raj defended his Ph.D. thesis entitled “Macro-encapsulated PCM cluster integrated air heater driven multi-tray solar dryers” under the guidance of Dr. S. Jayaraj and Dr. M. Srinivas on 18-09-2020.
- Mr. Anilkumar E.N defended his Ph.D. thesis entitled “Barriers, enablers and triple-bottom-line dimensions for the implementation of sustainable practices: modelling and analysis” under the guidance of Dr. R. Sridharan on 20-09-2020.
- Mr. Vishnu Prasad defended his Ph.D. thesis entitled “Property enhancement of flax fibre reinforced polymer composites by fibre and matrix modification” under the guidance of Dr. M. A. Joseph and Dr. K. Sekar on 22-10-2020.
- Mr. Vishnu C.R. defended his Ph.D. thesis entitled “Decision Models for Supply Chain Risk Management: Development and Analysis” under the guidance of Dr. R. Sridharan on 06-11-2020.
- Mr. Nithin Raj P defended his Ph.D. thesis entitled “Investigation and enhancement of mechanical and erosion-corrosion properties of A890 7A - hyper duplex stainless steel” under the guidance of Dr. M. A. Joseph and Dr. K. Sekar on 10-11-2020.
- Mr. Ajith Kuriakose Mani defended his Ph.D. thesis entitled “Parametric Identification and Solution of Nonlinear Dynamical Systems Using Fractional Order Differential Equations” under the guidance of Dr. M.D. Narayanan on 12-11-2020.
- Mr. Jeess George defended his Ph.D. thesis entitled “Modeling, Simulation and Experimental Investigation on Wire Electrical Discharge Turning of Inconel 825” under the guidance of Dr. R. Manu and Dr. Jose Mathew on 13-11-2020.

Mechanical Engineering Association (MEA)

- A lecture on **Thermal Power Plants: State of the Art and Future** delivered by **P M Sugathan**, on 28th January 2020. He is a Certified Energy Auditor, Certified Lead auditor for ISO 9001, Certified auditor for SA 8000. He has 34 years of experience in National Thermal Power Corporation and retired as Additional General Manager(Operation Services) from NTPC.

- A Skype interactive session on 12th February 2020 with **Rhinithaa P. Thanalakshme**, Joint MS/MBA candidate, UIUC. Forte foundation fellow Chicago, Illinois. The best outgoing student (2017) of NIT Calicut, the best graduation project (2017) in Btech, Mechanical engineering. She also received the Forte Foundation scholarship and an Illinois MBA merit scholarship.



- An Interactive session with our former director, **Dr. S S Gokhale**, who holds a PhD degree from the University of Illinois in Aerospace, Aeronautical and Astronautical Engineering. He has done his bachelors and masters in Aeronautical engineering from IIT Bombay and has vast experience in Higher Technical Education and is a trained Moderator in ZOPP.



On 11th March 2020:

A talk on **21st Century Technical Teacher** by **Prof. S S Gokhale** from 4:30 PM to 5:30 PM.

A talk on **Objectives of Pedagogy** by **Mrs. Beena Gokhale** from 5:30 PM to 6:30 PM.

On 12th March 2020:

A talk on **Essence of Aerospace Engineering** by **Prof. S S Gokhale** from 4:30 PM to 5:30 PM.

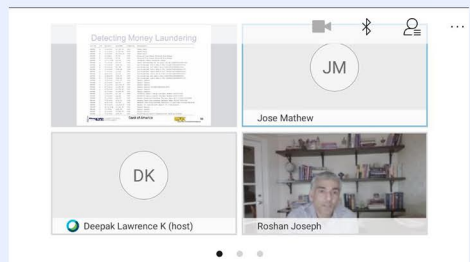
A talk on **Communication and Technical Writing** by **Mrs. Beena Gokhale** from 5:30 PM to 6:30 PM.



MED ALUMINI WEBINAR SERIES

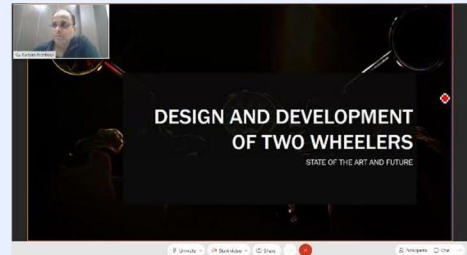
The Webinar Series started on 7th October 2020 in Cisco Webex platform.

- A webinar on "**Engineering to data science: A Personal Reflection**" by **Dr. Roshan Joseph** on 7th October 2020 (1993 PE NITC Alumni), **Russell Chandler III Professor**, Stewart, School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, USA. **Chief Editor of technometrics, International Journal of ASQ and ASA.**

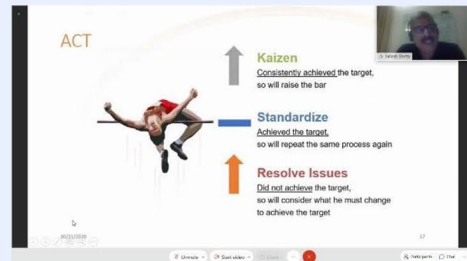


MED ALUMINI WEBINAR SERIES

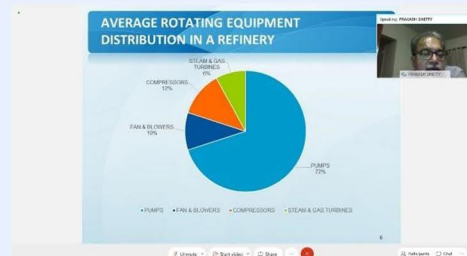
- A webinar on “**Design and Development of 2 Wheelers**” by **Kuriyan Arimboor** (2003 ME NITC Alumni) on 14th october 2020. **Divisional Manager(R & D)**, Bajaj Auto Ltd., Technical Expert of campus Recruitment team for Bajaj in IIT/NITs.



- A webinar on “**What it takes to build a Career? Knowledge or Attitude!**” by **Sailesh Shetty** (1985 ME NITC Alumni) on 21st october 2020. He is a **Vice President of corporate governance**, Toyota Kirloskar Motor, Bangalore,India.



- A webinar on “**Design Considerations for Rotating machinery in oil and gas industries:Industrial practice and standards**” by **Prakash Shetty** (1985 ME NITC Alumni) on 28th october 2020.He is a **Managing Director** at Gasotech Consultancy & marketing services, Gurgaon, Haryana,India.



- A webinar on 11th November 2020 entitled “**Multi-Disciplinary Thermal Technology**” by **Dr. Arun Muley** (1988 ME CREC/NITC Alumnus), **Technical Fellow and South East Asia Technology Director**, Boeing Research & Technology, Los Angeles, United states.



RECENTLY JOINED FACULTY MEMBERS



Dr. Sumer Dirbude
Designation: Assistant Professor
Date of joining: 03-02-2020
Qualification: PhD

Dr. Devendra Kumar Yadav
Designation: Assistant Professor
Date of joining: 13-03-2020
Qualification: PhD



Dr. Sandip Rudha Budhe
Designation: Assistant Professor
Date of joining: 11-03-2020
Qualification: PhD

Dr. Basil Kuriachen
Designation: Assistant Professor
Date of joining: 14-05-2020
Qualification: PhD



Dr. Jinu Paul
Designation: Associate Professor
Date of joining: 06-05-2020
Qualification: PhD

Upcoming Events

- Permission granted with grant-in-aid of Rs. 1,20,000/- by Science & Engineering Research Board (SERB) to organize a research internship program for four students, Topic: "Numerical study of mixing in T-junction and Dilute Gas-Droplet Flows with Evaporation".
- Short Term Training Programme (Virtual Mode) on Modern Computational Fluid Dynamics (CFD) With Industrial and Environmental Applications, February 1 – 5, 2021, Coordinator: Dr. Sumer Dirbude.
- Online Workshop on 3D printing Solutions for Medical Innovation (3DPSMI-2021) organized by Advanced Manufacturing Centre, Department of Mechanical Engineering, NIT Calicut in Collaboration with MVRCCRI Calicut, on 17 & 18th July, 2021, Coordinators: Dr. Jose Mathew, Dr Deepak Lawrence, Dr Basil Kuriachen & Dr Dinesh M (MVRCCRI).

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