AMRITA VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY
School of Engineering

sanketika

DEPARTMENT OF MECHANICAL ENGINEERING

Volume 1, Issue 1 | **Quarterly News Letter (Oct. - Dec. 2019)** | **January 5, 2020**

ACME

Association of Mechanical Engineering (ACME) is a departmental professional association formed to organise professional activities like seminars, workshops, industrial and inter-institute interactions, and other technical events for the benefit of students, to enhance their professional, organisational, and leadership skills.

PREFACE

ACME happily informs the release of our new quarterly newsletter '**SANKETIKA**'. This newsletter is intended to provide information and announcements regarding all technical and nontechnical events/ activities for the benefit of students, staff and other stakeholders of the department. ACME professional body will be responsible for the contents and release of this quarterly newsletter.

Vision of the Department

To transform our students into outstanding mechanical engineers with strong domain knowledge and skills, society-centric research intent, and exemplary ethical values, making them the most desired professionals by research institutions, industry and society

Mission of the Department

- To develop in each student, a profound understanding of fundamentals, motivation for continuous learning, and practical problem-solving skills for building a successful career.
- To create and share technical knowledge and collaborate with industry and institutions for the betterment of society.
- To imbibe ethical values, leadership qualities and entrepreneurial skills in students.
- To sustain a conducive environment to involve students

INSIDE THIS ISSUE

Message from the Chairperson

Dear Alumni, Students, Industry partners, Parents and Colleagues,

I am pleased to know that our department has come up with a next version of our quarterly newsletter "SANKETIKA". which serves as a central mode of information regarding all events and upcoming activities of the department. The year 2019 is ending with a note of success in many of our endeavours including research and I am sure that we continue to produce the best and brightest minds ready to tackle tomorrow's engineering challenges.

Hearty Congratulations to the ACME executive committee and the Editorial Board of SANKETIKA and Wishing you all a very Happy and Prosperous 2020!

- *Dr S Thirumalini*

Workshops/Seminars/Guest Lecture

- A one-day workshop on "Introduction to MATLAB for Mechanical Engineers' was conducted on 3rd December 2019 at the CAD Lab, Academic Block 1, Amrita Vishwa Vidyapeetham, Coimbatore. The workshop was held for M.Tech Students to improve their proficiency in using MATLAB. The topics covered during the workshop were Introduction to MATLAB Basics (data types, format, class, mathematical operations, array, Matrices etc.), Array & Matrix Operations (Creation, referencing, operations etc.) & MATLAB Programming. Tutorials were given during the program for the students to get a hands on training in the software. The number of participants was 18. The workshop was handled by Dr R Padmanaban, Assistant professor, Department of Mechanical Engineering.

- ACME is conducting several activities to develop technical skills of students. As a part of it, one-day intra-departmental technical symposium (INFERNO2K19) was conducted on 21st December 2019 by ACME. This symposium comprises of technical paper presentation, innovative ideas presentation, presentation in the theme of sustainability, poster presentation in the theme of industry4.0 and gaming contest. 50 students of B.Tech mechanical engineering participated and displayed their technical skills and won prizes worth ₹12000/-

- Guest lecture by Dr A Raja, Adjunct Professor (former General Manager, WRI-BHEL, Trichy) titled Advance Welding, Focusing on Automotive Applications was conducted on 4th December 2019. B.Tech Mechanical Engineering students attended the guest lecture.

- A guest lecture on Metal Additive Manufacturing by Dr. Srikanth Bontha from Department of Mechanical Engineering, National Institute of Technology Karnataka, Surathkal, India, has been organized at Department of Mechanical Engineering of Amrita Vishwa Vidyapeetham on 19th December 2019. B.Tech, M.Tech students, Ph.D. scholars and faculty members were present during the session.

- Prof. Eric Butcher from the department of Aerospace and Mechanical engineering from the University of Arizona visited Amrita School of Engineering, Coimbatore on 16-17th Dec.2019. Prof. Eric had discussion with faculty members from Aerospace, Mechanical Engineering and CEN on establishing research collaboration in the areas of Dynamics and control.

Publications

1. Thomas, T., & Saleeshya, P. G. (2019). Application of lean manufacturing practices in the banking industry - a case study. *International Journal of Business Innovation and Research*, *20*(3), 283-304.
2. Shailesh, R., Ramu, M., Govindaraju, M., Karthikeyan, K., & Satheeshkumar, V. (2019). Performance Evaluation of Adhesive Spur Gear with the Influence of Properties of Adhesive. In *Advances in Computational Methods in Manufacturing* (pp. 923-931).
3. Meenakshi, Sundaram S & Saimurugan, M (2019). Performance Improvement of Classifier in Fault Diagnosis of Rotating Machines Using Sensor Fusion Techniques, 8(6), (pp. 1136-1141). *International Journal of Engineering and Advanced Technology (IJEAT).*
4. J. A. Mozhi, Mohanraj, and Dr Radhika N (2019). Effect of bio cutting fluids on surface roughness during end milling of A359 aluminium alloy, *International Journal of Mechanical and Production Engineering Research and Development*, 9(2), (pp. 987–996).
5. T. Mohanraj & M. Dinesh Kumar (2019). The process parameter optimization for grey cast iron in turning process using response surface methodology, *International Journal of Mechanical and Production Engineering Research and Development*, 9(2), (pp. 997–1006).
6. Baranitharan, P., Ramesh, K., & Sakthivel, R. (2019). Measurement of performance and emission distinctiveness of Aegle marmelos seed cake pyrolysis oil/diesel/TBHQ opus powered in a DI diesel engine using ANN and RSM. *Measurement*, *144*, 366-380.
7. Baranitharan, P., Ramesh, K., & Sakthivel, R. (2019). Multi-attribute decision-making approach for Aegle marmelos pyrolysis process using TOPSIS and Grey Relational Analysis: Assessment of engine emissions through novel Infrared thermography. *Journal of Cleaner Production*, *234*, 315-328.
8. Ashwin, A., Lakshman, R. H., Swaroop, C. C., Vignesh, M., Vignesh, R. V., & Padmanaban, R. (2019, October). Predicting the Wear Rate of Aluminum Alloy AA2024-T351 using Hybrid Linear function and Radial Basis Function. In *IOP Conference Series: Materials Science and Engineering* (Vol. 561, No. 1, p. 012046).
9. Govindaraju, M., Vignesh, R. V., & Padmanaban, R. (2019). Effect of Heat Treatment on the Microstructure and Mechanical Properties of the Friction Stir Processed AZ91D Magnesium Alloy. *Metal Science and Heat Treatment*, *61*(5-6), 311-317.
10. Shailesh, R., Ramu, M., Govindaraju, M., Karthikeyan, K., & Satheeshkumar, V. (2019). Performance Evaluation of Adhesive Spur Gear with the Influence of Properties of Adhesive. *In Advances in Computational Methods in Manufacturing* (pp. 923-931).
11. Kumar, T. S., Shalini, S., Ramu, M., & Govindaraju, M. (2019). Characterisation of AZ31/ZrO2 composites produced via stir casting. *Materials Research Express*, *6*(11), 1165d1.
12. Shankar, S., Mohanraj, T., & Pramanik, A. (2019). Tool Condition Monitoring While Using Vegetable Based Cutting Fluids During Milling of Inconel 625. *Journal of Advanced Manufacturing Systems*, *18*(04), 563-581.
13. Godson, R. S., Thirumalini, S., & Tulapurkar, C. (2019, November). Numerical Modelling of Methanol-Gasoline Blends in PFI Spark Ignition Engines. In *IOP Conference Series: Materials Science and Engineering* (Vol. 577, No. 1, p. 012148).
14. Vignesh R. V. Padmanaban, R. Govindaraju M. & Priyadharshini G. S. (2019). Mechanical properties and corrosion behaviour of AZ91D-HAP surface composites fabricated by friction stir processing. *Materials Research Express*, *6*(8), 085401.
15. Vignesh, R. V., Padmanaban, R., & Govindaraju, M. (2019). Investigations on the surface topography, corrosion behaviour, and biocompatibility of friction stir processed magnesium alloy AZ91D. *Surface Topography: Metrology and Properties*, *7*(2), 025020.
16. Kannan, K. R., Vignesh, R. V., Kalyan, K. P., Murugesan, J., Megalingam, A., Padmanaban, R., & Govindaraju, M. (2019, July). Tribological performance of heavy-duty functionally gradient friction material (Cu-Sn-Fe-Cg-SiC-Al2O3) synthesized by PM route. In *AIP Conference Proceedings* (Vol. 2128, No. 1, p. 020004).
17. Srujan, P. K. S., Kaka, H. K., Vignesh, R. V., Kalyan, K. P., Padmanaban, R., & Govindaraju, M. (2019, July). Cost-effective manufacturing of piping components with consistent quality through continuous furnace brazing. In *AIP Conference Proceedings* (Vol. 2128, No. 1, p. 030006).
18. Kumar, R. A. Sai K. P., Vignesh, R. V. & Radhika, N. (2019). Investigations on the Tribological Properties of Heat-Treated Copper Composite Using Hybrid Quadratic–Radial Basis Function Model. *Transactions of the Indian Institute of Metals*, *72*(12), 3117-3128.
19. Naveen, E., & Ilangovan, S. (2019). Tribo-Mechanical Behaviour of Al-Cu-Si castings. In *IOP Conference Series: Materials Science and Engineering* (Vol. 577, No. 1, p. 012131).

20. Chellu, P. K., Padmanaban, R., Vignesh, R. V., Menon, A. S., Shariff, S. M., & Padmanabham, G. (2019). Experimental Study on Laser Welding of AISI 304 Steel with Design of Experiments Approach. In *IOP Conference Series: Materials Science and Engineering* (Vol. 577, No. 1, p. 012117).
21. Siddharth, S., & Ramesh, A. (2019). Homogenization of Mechanical Properties of Unidirectional Fibre Reinforced Composites with Matrix and Interface Defects: A Finite Element Approach. In *Journal of Physics: Conference Series* (Vol. 1355, No. 1, p. 012040).
22. Arjun, K. B., Harikeshava, R., Sreenath, C. R., Srihari, G., Vignesh, R. V., & Padmanaban, R. (2019). Effect of load, sliding distance and sliding velocity on the wear properties of aluminum alloy AA5052. In *IOP Conference Series: Materials Science and Engineering* (Vol. 577, No. 1, p. 012016).
23. R. Vaira Vignesh, R. Padmanaban, M. Govindaraju & G. Suganya Priyadharshini (2019) Investigations on the corrosion behaviour and biocompatibility of magnesium alloy surface composites AZ91D-ZrO_2 fabricated by friction stir processing, Transactions of the IMF, 97:5, 261-270
24. Kumar, D. S., Thirumalini, S., & Praveen, H. S. S. K. (2019). Experimental investigation to improve performance and emission characteristics of a diesel engine by using n-butanol as additive to the biodiesel-diesel blends. In *IOP Conference Series: Materials Science and Engineering* (Vol. 577, No. 1, p. 012102).
25. Sandeep, S., Kumar, D. S., Krishnan, S., & Pandey, S. K. (2019). Assessment of atomized water injection in the intake manifold of a heavy duty diesel engine for NOx reduction potential. In *IOP Conference Series: Materials Science and Engineering* (Vol. 577, No. 1, p. 012186).

Ph.D. Awarded

- A Sumesh was awarded Doctorate in Philosophy from Amrita Vishwa Vidyapeetham, for his contributions in the field of Welding Technology. The title of his thesis is 'Arc Signature Classification Using Machine Learning Approach to Identify Weld Defect Conditions in a Robotic Pulsed GMAW Process'.

- Jithin E. V was awarded Doctorate in Philosophy from Amrita Vishwa Vidyapeetham, for his contributions in the field of Combustion Engineering. The title of his thesis is 'Measurement of burning velocities of hydrocarbon hydrogen mixtures and application to premixed laminar burner design'.

- Vaira Vignesh was awarded Doctorate in Philosophy from Amrita Vishwa Vidyapeetham, for his contributions in the field of Manufacturing Engineering. The title of his thesis is 'Synthesis of Magnesium Alloy Surface Composites by Friction Stir Processing'.

Funded projects

Title: Computational and experimental investigations on a combined nonlinear vibration absorber, energy harvester system
Funding agency: DST-SERB/TARE **Amount:** ₹18,30,000/- **Duration:** 3 years
Principal Investigator: Dr.B.Santhosh, School of Engineering, Amrita Vishwa Vidyapeetham, Coimbatore
Mentor: Dr.I.R Praveen Krishna, IIST, Trivandrum

Abstract: Multi-functional energy harvesting systems combine objectives such as vibration absorption and energy harvesting. It is necessary to understand the modal interactions which facilitate the transfer of energy from the host structure to the nonlinear energy sink (NES) and then the conversion to electric energy through a generalized computational framework and validation by experiments. This will provide avenues to develop efficient energy harvesting technologies in the future. This self-powered autonomous technology has applications in healthcare, automotive sector, space applications, environmental and structural health monitoring.

Programs Attended

- Dr R Sakthivel and Dr S Prabhu attended a short term training programme, TEQIP-111-(ANSYS CFD & Chemkin Pro in IC Engines) at Govt. College of Technology, Coimbatore during 21-25 Oct 2019
- Dr K Balaji and Mr S Karthick attended a short-term course on "Advances in thermos-fluidics of multiphase flows" conducted at IIT Madras from 4th to 9th November 2019, sponsored by All India Council for Technical Education (AICTE)
- Workshop on Nonlinear Oscillations, Waves and Advanced Asymptotic Methods, conducted at IIT Gandhinagar during November 11-13, 2019 was attended by Dr B Santhosh and Dr Bipin Balram
- Dr T Mohanraj attended a short-term course on "Internet of Things: Concepts and Implementation" conducted at IIITDM, Kanchipuram during 15-19 November 2019, sponsored by All India Council for Technical Education (AICTE)
- Mr Arun A and Mr M Thenarasu had attended a Faculty development program on Manufacturing Technology (Stamping, Injection Moulding and Die-casting) at Roots Industries India Ltd, Coimbatore on 25-26 November 2019
- Dr K Rameshkumar presented a paper at 2nd International Mechanical Engineering Congress (IMEC) – 2019 during 29th November 2019 to 1st December 2019 at NIT Trichy
- Dr S Thirumalini had an International visit to Grenoble University, France for Collaborative Discussions on Teaching and Research during 12-23 December 2019
- Dr M Ramu attended a workshop on "Metal Additive Manufacturing Technology-Gaps and Research Directions" at PSG Technology, Coimbatore on 16-18 December 2019

Faculty Column

Is India Ready to embrace rEVolution?

Paris climate accord has initiated a global shift in energy management. Governments have agreed to go with greener methods of transportation. Adopting electric vehicle is one small step towards achieving lesser carbon footprint is appreciable. India being a developing country has joined the bandwagon to promote electric vehicles. Recently we have witnessed companies like TATA and Hyundai bringing out their all-electric cars in the market. The driving range is varying from 120 to 300 km. The question we have in our mind is whether our country is ready for such a revolution. The major hurdles are battery and infrastructure.

Courtesy: https://tiresandparts.net

The requirement of Lithium-ion battery for such mass production of EVs is a big concern. Moreover, our country has to depend on imports of these batteries, which in turn reduces the popularity of these vehicles. Moreover, adequate measures to dispose of the spent batteries are not in place. The infrastructure required for charging these cars at every 100 km of the road becomes essential if these EVs have to be popular. Lack of charging stations on our (at least) highways might hinder the growth of this segment of vehicles. We need the infrastructure in place to take care of the production until recycling. Then and only then, the government can push for EVs.

-Mr D Unnikrishnan
Assistant Professor (Sr. Gr.)

Student Achievements

Placements

Company Name	Number of MECH Students Placed
Alstom	3
Bridgei2i	1
Careers360	1
Ninjacart-GET	1
Robert Bosch	1
Fiat Chrysler	1
Hyundai Motors	1
Dassault Systems	2
Infosys- SES	2
IQVIA	2
Cameron	2
TCSDigital	2
Titan	2
KION	2
The Climber	3
Caterpillar	3
Skill-Lync	4
Infosys	18
Cognizant	22
TCS	34
Total	**107**

Student Exchange Program

UPC-Spain

Nagasubramanian Thiyagarajan

(Mechanical Engineering 2016-2020)

University of Twente, Netherlands

Ilambharathi Govindasamy

(Mechanical Engineering 2016-2020)

TU Munich

Abhishek Sriram

(Mechanical Engineering 2016-2020)

Programs' Attended

- Mr Hariharan *(3rd Year 2017 Batch)*, B.Tech Mechanical Engineering student attended visited a village in Idukki, Kerala, along with students from Saxion University, Netherlands as a part of Live-in-Labs program during 22 - 25 November 2019.
- Mr.Vignesh .A *(3rd Year 2017 Batch)*, B.Tech Mechanical Engineering student visited Areca Nut plate factory in Coimbatore as a part of Live-in-Labs program on 15 November 2019
- Workshop on Nonlinear Oscillations, Waves and Advanced Asymptotic Methods, conducted at IIT Gandhinagar during November 11-13, 2019 was attended by Mr.Rony Philip and Mr.Emmanuel Ruben Gilbert (Ph.D. Scholars)
- 23 Third year Mechanical Engineering students attended Co- design and project Management workshop conducted at School of Engineering, Amrita Vishwa Vidyapeetham, Coimbatore on December 19th 2019
- Fourteen third year B.Tech Mechanical Engineering student visited villages' at Uttarakhand, as a part of Live-in-Labs program during December 2019 – January2020.

Student Column

கூவும் சேவல் கூத்தாடும் கரையும் காகம் இசைபாடும்
உன் உதயமோ வழிகாட்டும்
பாரா கண்களும் விழி அசைக்கும்
மலர் மொட்டும் புன்னகைக்கும்
இருள் நிழலாய் குறுகும்
தூய்மையின் சுவாசம் பரவும்
நீ மறையும் காரணம் உன் விடியலில் புரியும்
எழுந்து வா தோழா உன்னால் முடியும்....

- ***VISWA PRASAD. S. V***
(3rd Year 2017 Batch)

கண்ணீரில்லா கண்ணிகை,
பாசனமான பயிர்,
பசியாரிய பச்சிளம்குழந்தை,
வெறுக்காத வெயில்,
குழைக்காத குளிர்,
வயலாற்றும் வானம்,
வரையறுத்த வரைபடம்,
பறையுள்ளப் பள்ளி,
பசியில்லாப் பண்டிதன்,
நிலவின் நிலம்,
ஆற்றின் ஆற்றல்,
கதிரவனின் கதிர்,
அழிவில்லா அணு,
மண்டியிடா மண்ணாளன்,
பகையற்றப் பக்கம்,
வீணாகா விழி,
மதமில்லா மனம்,
குலமில்லாக் குணம்,
பேதமில்லாப் பேச்சு,
நசியா நதி,
மலமாகாத மண்.
இவை இருந்தால் இழிவில்லா இந்தியா
,இன்பமான இந்தியா என்பது
இன்றியமையாதிருக்கும்.

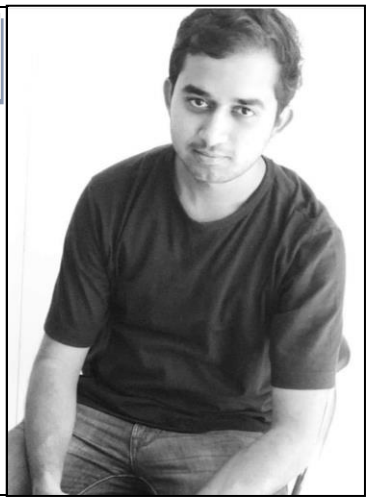
- ***KOWSICK CHANDRA GUPTHA B***
(2nd Year 2018 Batch)

Slam Poetry

'Hey' the moment I heard your voice
Everything turned blank
And my heart cranked
I felt your presence intense
And I lightened into my comfort zone
Just like with the rain, the sun that shone
I wanted to come close
I wanted to hug you
To be in blissful peace
But I don't know why my feelings ceased
I, the atheist, prayed to god
That you come near, my dear
And the next moment you sat here
I look deep into your eye
And everything around blurred
As an insecure space, I was engulfed
Thousands of stuff were running in my mind
I now felt your warmth, and
In my head, those shit I couldn't find
You asked me to speak,
But I couldn't utter a word
I was numb, yes,
Numb by pure happiness
I wanted to hold your hand
And never let it go
I had so much of love
I want to show
All my problems turned out to be a lie
My soul at sky high
As the truth was here by my side.
Just like all the time the past two days
I realized how much I miss you,
again and again
You had to go
And though hesitant, and though with pain, I let you to
But that 2 minutes I had with you
Those are my most precious few
Cos, I felt me, and I could feel you...

- JEEVAN. S
(3rd Year 2017 Batch)

Alumni Corner



Hi Friends
I am **Sriranganathan K** (Mechanical Engineering 2014-18 Batch) currently working as Business Analyst, Trendence Analytics, Bangalore.
My days at Amrita are unforgettable and in fact those days are the most happiest & fruitful days in my life. I proudly feel that I cherished every moments of at Amrita.
I have made lot of friends and learned things that would last a lifetime.
My life at Amrita was flooded with assignments, quizzes, presentation, papers and exams. However, with the guidance from enthusiastic faculties, all the efforts made by me were rewarded at last. Some of the skills that I developed in Amrita is to simplify and solve complex problems and the ability and desire to keep learning things. These skills are really helping me in my career and life.
Thank you AMRITA …

Album

Sinesh V *(3rd Year 2017 Batch)*

Varsha V *(3rd Year 2017 Batch)*

Photography by:
Rahul V Iyer *(3rd Year 2017 Batch)*

Photography by:
JEEVAN. S *(3rd Year 2017 Batch)*

Mechanical Engineering Department bagged the overall first Prize for the various events conducted during Gokulashtami Celebrations 2019.

Upcoming Events:

- Anokha
- Sports Day
- Pongal Celebrations
- Ugadi Celebrations
- Amritotsavam

Editorial Board:

Staff

- Dr Ajith Ramesh
- Mr Arun A
- Mr C S Sumesh
- Dr A Sumesh
- Mr A S Prakash

Students

- Mr M V R Aravind
- Mr Brite B
- Mr Easwar Thangam
- Ms Harshini G V