

NEWSLETTER

DEPARTMENT OF MECHANICAL ENGINEERING

COLLEGE OF ENGINEERING, TRIVANDRUM (CET)

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Vision of CET

National Level Excellence and International Visibility in Every Facet of Engineering Research and Education.

Mission of CET

To facilitate quality transformative education in Engineering and Management.

To foster innovations in Technology and its application for meeting global challenges.

To pursue and disseminate Quality Research.

To equip, enrich and transform students to be Responsible Professionals for better service to humanity.

Vision of Department

Be among the best Mechanical Engineering Departments in the country, providing quality education and fostering research to meet global challenges.

Mission of Department

M1 Impart education that paves a solid foundation in Mechanical Engineering and related interdisciplinary fields of engineering to meet global challenges.

M2 Prepare the students to excel in their profession through efficient and effective learning, research, innovation, leadership and entrepreneurship.

M3 Develop professional responsibility, sustainability and networking skills among the faculty and students to ethically address the needs of society.

From the Principal's Desk



I am glad to know that the Department of Mechanical Engineering of College of Engineering, Trivandrum is bringing out a monthly Newsletter to commemorate the 80th Anniversary of College of Engineering, Trivandrum (CET).

The Department of Mechanical Engineering also turned 80. The college is proud of the achievements of the students and staff of the department and bringing out this Newsletter. The Department of Mechanical Engineering has carried a name for itself in pursuit of CET's vision and mission and its own vision and mission. Its students, staff and alumni have made their alma mater proud by becoming very responsible citizens and professionals doing service to the society. I wish all success for the Newsletter and hope they carry forward the vigor and dedication for bringing out the future volumes of Newsletter.

Head of Department's column



I have immense pleasure for bringing out the inaugural issue of the "Newsletter" of Department of Mechanical Engineering, College of Engineering Trivandrum (CET). This is a part of the 80th anniversary celebrations of CET. The Department of Mechanical Engineering started in 1939 has been the heart and spirit of this premier institution right from its inception. Rated very high, this department is Alma Mater to several technocrats and researchers world over. The department has a rich tradition of pursuing academic excellence and providing congenial environment for the overall development of its students. This newsletter provides a panoramic view of the academic, research, co-curricular activities and achievements of the faculty and students of this Department. I congratulate the editorial team for their sincere effort to bring out the news letter in time. This inaugural issue of newsletter should inspire all of us for a new beginning; enlighten us with hope, confidence and enthusiasm towards the road ahead.

MAJOR EVENTS IN THE CAMPUS



80th anniversary celebrations inauguration by Honorable Chief Minister of Kerala Shri. Pinarayi Vijayan.

80th Anniversary Celebrations

The 80th Anniversary Celebrations of CET was inaugurated by the Honorable Chief Minister of Kerala Shri. Pinarayi Vijayan on October 28, 2019. The function was held at Diamond Jubilee Hall of CET. Honorable Minister for Higher Education, Minority Welfare, Hajj and Wakf Shri. K T Jaleel presided over the function. Honorable Minister for Minister for Co-operation, Tourism and Devaswoms Shri. Kadakampally Surendran inaugurated the 'Haritha Anganam' project in the function. Welcome speech was delivered by the Director of Technical Education Prof. Dr. Indira Devi. Principal Prof. Dr. Jiji C V presented the 80 years of glory of CET. Thiruvananthapuram Corporation Councilor Shri. Alathara Anil Kumar felicitated the function. Organizing Secretary Prof. Dr. N Asok Kumar delivered the vote of thanks. College Union Chairman Shri. T R Anjuradth, PTA Vice President Shri. K T Balabaskaran, CETAA Vice President Shri. K P Krishnakumar where the other dignitaries present on the dais occasion.

Students Union Inauguration

The college students union for 2019-2020 was inaugurated by the Worshipful Mayor of Thiruvananthapuram Corporation Shri. K Sreekumar on November 21, 2019. OCW launch was done by Worshipful Mayor in the same function. The function was held at Diamond Jubilee Hall of CET. Principal Dr. Jiji C V presided over the function. Renowned Film Director Shri. Anuraj Manohar released the college magazine. College Union Chairman Shri. T R Anjuradth welcomed the gathering and College Union General Secretary Shri Taaby Prasad Stephen thanked the

gathering. Prof. Dr. M Abdul Nizar - Dean (U. G), Prof. Shenil P S - Staff Advisor to College Union and Prof. Dr. Vinod B R - Treasurer of College Union felicitated the function



College Union inauguration and OCW launch by Worshipful Mayor Shri. K Sreekumar



Magazine release by Shri. Anuraj Manohar

DEPARTMENT ACTIVITIES

NBA Accreditation 2019

The Department of Mechanical Engineering applied for NBA accreditation of the UG courses (B.Tech in Mechanical Engineering and B.Tech in Industrial Engineering). The pre-qualifier was submitted on February 22, 2019 after extensive data collection through various committees coordinated by **Prof. Dr. V Regikumar**. Subsequently Self Assessment Report (SAR) was filed on May 09, 2019. Besides the various training classes conducted on college level, external expert from Bangalore Engineering College had rechecked the files & SAR on October 28, 2019. Modified SAR (incorporated with rectification suggested by expert) was filed on November 02, 2019. Finally the NBA Team visited for verification on November 01, 02 and 03, 2019 (Friday to Sunday). The team comprised of Chairman and a team of two experts for each UG program. The first two days activities included inspection of teaching sessions, verification of laboratory sessions, interactions with all stakeholders and files verification. Exit meeting was conducted on the last day. The team expressed satisfaction on the overall performance of the department. They also suggested few improvements to be made. A brief report on the whole accreditation process was made available to all faculty members by the accreditation coordinator **Prof. Dr. V Regikumar**.

KTU Audit and DQAC

The external academic audit by the APJ Abdul Kalam Technological University was conducted on November 13, 2019. Department Quality Assurance Cell (DQAC) coordinated the activities. **Prof. Dr. A Samson** is the Chairman and **Prof. Dr. Ajith P M** is the coordinator of DQAC. Over 125 course files of B.Tech and M.Tech programs were made available for the audit. The external auditor expressed satisfaction on the conduct of the courses. The DQAC was constituted on August 01, 2018 and has been instrumental in bringing new standards in pedagogy and record keeping.

Faculty Development Program

The Department of Mechanical Engineering, College of Engineering had conducted a FDP during July 15-19, 2019 on "Advances in Fluid flow and Heat Transfer". **Dr. Rajkumar M.R**, Associate Professor in Mechanical Engineering of this department was the coordinator. APJ Abdul Kalam Technological University, Thiruvananthapuram, Kerala was the sponsor. There were 30 participants. Experts

were from IITs, IIST and other national institutes.

Industrial Trainings

Mechanical Engineering Department in association with Bosch-Rexroth CET Center of Excellence in Automation Technologies <https://www.cet.ac.in/bosch-rexroth/> had conducted Internship in Automation Technologies from 24/06/19 to 31/07/2019 of 5 days duration. Students from CET and other colleges from the state had availed the training program. The total number of students trained were 291. A nominal course fee of Rs. 1800/- was charged per student. Another program "Training on Robotics and Industrial Automation" was conducted from 25/09/2019 to 10/11/2019 for 120 hours duration. There were 16 participants. The course fee was Rs. 7500/-. Another batch of 28 students registered for the evening training program of 120 hours duration on "Robotics and Industrial Automation" conducting from 16/10/2019.

FACULTY ACHIEVEMENTS

Academic excellence

Dr. Karthika A S, former Associate Professor in Mechanical Engineering of this department (Now at Government Engineering College, Kannur) has obtained her PhD degree from University of Kerala. **Dr. S Anilal**, Professor in Mechanical Engineering of CET was her guide. Her open defense was conducted in this department on October 25, 2019.

Patents in 2019

Department of Mechanical Engineering filed a patent for College of Engineering, Trivandrum. Title of the invention is "An Integrated Test Bench Device for Testing Frictional Behaviour of Materials". The inventors are **Paul G Panicker** (M.Tech student) and **Prof. N Sasi**, **Prof. Dr. V R Rajeev** and **Prof. Dr. N Asok Kumar**. The details are available in the Official Journal of The Patent Office of India, Issue No. 29/2019 dated 19/07/2019.

" Education which does not mould character is absolutely worthless "

Mahatma Gandhi

Sponsored Projects of 2019

1. **Dr. Abhilash Suryan** has secured Rs. 25,00,000/- (Rupees Twenty Five Lakhs only) as research grant from AICTE on behalf of the National Doctoral Fellowship Ph.D scholar **Mr. Sandeep Soman** under his guide-ship. The grant is for the Project titled "Gas Dynamics and Propulsion Research Lab " under the *Research Promotion Scheme for Research Centers under National Doctoral Fellowship (RPS-NDF)* during the financial year 2018-19. The duration of the project is THREE years
2. **Dr. Rani S** has secured Rs. 21,00,000/- (Rupees Twenty One Lakhs only) as research grant from AICTE on behalf of the National Doctoral Fellowship Ph.D scholar **Smt. Sneha E** under her guide-ship. The grant is for the Project titled " Feasibility of Developing Sustainable and Eco-Friendly Industrial Lubricant from Vegetable Oil " under the *Research Promotion Scheme for Research Centers under National Doctoral Fellowship (RPS-NDF)* during the financial year 2018-19. The duration of the project is THREE years.
3. **Dr. Mini R S** has secured Rs. 11,00,000/- (Rupees Eleven Lakhs only) as grant from AICTE in November 2018. The grant is for the "Modernization of Metallurgy Lab" of Mechanical Engineering Department under the *MODROBS Scheme* during the financial year 2018-19. The duration of the project is THREE years.

Publications in 2019

1. **John Paul Panuthara , Joe Paul Martin Mutathara , Rajkumar Mattacaud Ramachandralal, Lazarus Godson Asirvatham, Somchai Wongwises**, "Experimental investigation of condensation heat transfer on chlorotriethylsilane coated grooved vertical tube", *Int. Commu. In Heat and Mass Transfer, Elsevier*, Vol. 108, 2019, pages 1- 6.
2. **V. K. Chithrakumar, G. Venugopal, M. R. Rajkumar**, "Convection in vertical annular gap formed by stationary heated inner cylinder and rotating unheated outer cylinder", *Heat and Mass Transfer, Springer*, Vol. 55, 2019, pages 2873 - 2888.
3. **Abhay Mohan, Palani Kumar, Chidambaram, Abhilash Suryan, Heuy Dong Kim**, "Energy efficiency analysis of wet compression systems through thermo- fluid dynamic considerations", *Journal of Cleaner Production*, Vol. 214, 2019, pages 132-144.
4. **Bastian, Blossom Treesa, N. Jaspreeth, S. Kumar Ranjith, and C. V. Jiji**, "Visual inspection and characterization of external corrosion in pipelines using deep neural network" , *NDT& E International*, Vol. 107, 2019, pages 102134.
5. **YP Vaishnu, K Bindu Kumar and S Rani**, "Parameter optimization and wear characteristics of nano CuO/Ni composite coating by brush plating technique" , *Proc. IMech E Part J: J Engineering Tribology*, Vol. 0(0), 2019, pages 1- 9.
6. **Nair, Prasanth P., Abhilash Suryan, and Heuy Dong Kim**, "Computational study on flow through truncated conical plug nozzle with base bleed", *Propulsion and Power Research*, 2019.
7. **Valsala, Reji Reghunathan, S. W. Son, Abhilash Suryan, and Heuy Dong Kim**, "Study on reduction in pressure losses in pipe bends using guide vanes", *Journal of Visualization*, Vol. 22, No. 4, 2019, pages 795-807.
8. **Reghunathan Valsala, Reji, Tae Young Kim, Seok Woo Son, Abhilash Suryan, and Heuy Dong Kim**, "Computational investigation on the flow characteristics in beam dyeing process", *The Journal of The Textile Institute*, 2019, pages 1-13.
9. **Suryan, Abhilash, Sandeep Ephram, Prasanth P. Nair, and Heuy Dong Kim**, "Study of flow characteristics of supersonic flow through pipe bends", *In AIP Conference Proceedings, AIP Publishing*, Vol. 2134, No. 1, 2019, pages 040007.
10. **Gopalakrishnan, Unnikrishnan, S. Vishnu Prasad, Vaisakh S. Nair, and Abhilash Suryan**, "Investigation on the effect of baffle position on sloshing in tanks" , *In AIP Conference Proceedings, AIP Publishing*, Vol. 2134, No. 1, 2019, page 040005.
11. **Soman, Sandeep, Johny George, Prasanth P. Nair, and Abhilash Suryan**, "Numerical study of flow through planar double divergent nozzles", *In AIP Conference Proceedings, AIP Publishing*, Vol. 2134, No. 1, 2019, page 020006.
12. **Dijin, J. S., M. R. Rajkumar, and Anjan R. Nair**. "Determination Of Heat Transfer Characteristics Employing Modified Maximum Slope Method For Porous Media Heat Exchanger Using Al₂O₃ - Water Nanofluids." *E3S Web of Conferences*. Vol. 128. EDP Sciences, 2019, 04011.
13. **Ananthu, J. P., and N. Asok Kumar**. "Performance evaluation of shock tube with helium and carbon dioxide using numerical simulation." *Journal of Physics: Conference Series*. Vol. 1240. No. 1. IOP Publishing, 2019.
14. **Sneha, E., S. Rani, and Muhammed Arif**. "Evaluation of lubricant properties of vegetable oils as base oil for industrial lubricant." *IOP Conference Series: Materials Science and Engineering.*, Vol. 624. No. 1. IOP Publishing, 2019.
15. **Krishnan, R. Rakhil, and V. Regi Kumar**. "Digital requirement analysis in a public sector bank after demonetisation." *Recent Advances in Materials, Mechanics and Management: Proceedings of the 3rd International Conference on Materials, Mechanics and Management (IMMM 2017)*, July 13 - 15, 2017,

- Trivandrum, Kerala, India. CRC Press, 2019.
16. **Binuraj V K, Asok Kumar N**, "Role of Skilled Manpower and their Allocation in a Production Line: A Case Study", *International Research Journal of Engineering and Technology (IRJET)* , Vol. 06, Issue: 07, July 2019, pages 1545 - 1547.
 17. **Rajappan, Rakhil Krishnan, and K. Sunil Kumar**. "Structural optimization of conical panel assembly for grid-stiffened launch vehicle structure." *AIP Conference Proceedings*. Vol. 2134. No. 1. AIP Publishing, 2019.
 18. **S. Aneesh, N. Asok Kumar**, Reverse Logistic Network for used Refrigerators, *International Journal of Research in Engineering, Science and Management*, Vol 2, Issue-6, June-2019 pages 280 - 283 .
 19. **Shichin, C., AC Vinay Chandran, and V. S. Unnikrishnan**. "A methodology to detect and extract tables from born-digital PDF documents using deep learning." *Recent Advances in Materials, Mechanics and Management: Proceedings of the 3rd International Conference on Materials, Mechanics and Management (IMMM 2017)*, July 13 - 15, 2017, Trivandrum, Kerala, India. CRC Press, 2019.
 20. **Sreenivasan, Jayakrishnan, and K. Sunil Kumar**. "Career mapping based on abilities, skills and interest perspective." *AIP Conference Proceedings*. Vol. 2134. No. 1. AIP Publishing, 2019.
 21. **Sreekumar, Soumithri, and K. Sunil Kumar**. "Determination of the relative importance of factors affecting maternal health-care in India." *AIP Conference Proceedings*. Vol. 2134. No. 1. AIP Publishing, 2019.
 22. **Viswam, Amal, and Vineetha S. Das**. "Modeling and Analysis of Smart Warehousing through Simulation Study.", *International Journal of Research in Engineering, Science and Management*, Vol.-2, Issue-7, July-2019, pages 614-617
 23. **Sunil, Kumar S, Neeraj M P, Ajay Kumar S, Mathews Johns**, "Numerical Modeling and Experimental Studies on a Wire Mesh Heat Exchanger." *ASTFE Digital Library*. Begel House Inc., 2019.
 24. **Abraham, Jyothish, G. Venugopal, and M. R. Rajkumar**. "Experimental investigation on effect of helical grooves on condensation heat transfer performance of vertically oriented copper tubes." *E3S Web of Conferences*. Vol. 128. EDP Sciences, 2019.
 25. **Rameshan, Sangeeth, and S. Kumar Ranjith**. "Experimental study on Leidenfrost water droplets impact on heated aluminium ratchet surface." *Recent Advances in Materials, Mechanics and Management: Proceedings of the 3rd International Conference on Materials, Mechanics and Management (IMMM 2017)*, July 13 - 15, 2017, Trivandrum, Kerala, India. CRC Press, 2019.
 26. **Abhilash, R., and S. Anil Lal**, "Prediction of coherent structures in end-wall flows using hybrid grids developed for turbo machinery applications." *Recent Advances in Materials, Mechanics and Management: Proceedings of the 3rd International Conference on Materials, Mechanics and Management (IMMM 2017)*, July 13 - 15, 2017, Trivandrum, Kerala, India. CRC Press, 2019.
 27. **Rameshan, Sangeeth, and S. Kumar Ranjith**. "Experimental study on Leidenfrost water droplets impact on heated aluminium ratchet surface." *Recent Advances in Materials, Mechanics and Management: Proceedings of the 3rd International Conference on Materials, Mechanics and Management (IMMM 2017)*, July 13 - 15, 2017, Trivandrum, Kerala, India. CRC Press, 2019.
 28. **Akhil Sankar K, Venugopal, G., and P. M. Ajith**. "Enhancing Productivity by Standardization of Operations in a Small Scale Industry", *International Journal of Applied Engineering Research*, Vol. 14, Number 14, 2019, pages 22-27.
 29. **Sajikumar, S., and V. Regi Kumar**. "Analysis of bus bunching effect in morning peak period." *Recent Advances in Materials, Mechanics and Management: Proceedings of the 3rd International Conference on Materials, Mechanics and Management (IMMM 2017)*, July 13 - 15, 2017, Trivandrum, Kerala, India. CRC Press, 2019.
 30. **Satheeshkumar, M., and K. Krishnakumar**. "Ergonomic design modifications of de-fibering machine in coir industry-A case study." *Recent Advances in Materials, Mechanics and Management: Proceedings of the 3rd International Conference on Materials, Mechanics and Management (IMMM 2017)*, July 13 -15, 2017, Trivandrum, Kerala, India. CRC Press, 2019.
 31. **Zaviar, Sebin, V. R. Shijil, Sinto Raphael, R. Sreeram, C. K. Sudarsh, V. R. Rajeev, and K. K. Manesh**. "Effect of grain refiner (0 to 1 wt.% Al - 5Ti-B) addition on the microstructural and hardness characteristics of Al 336 alloy". in *Recent Advances in Materials, Mechanics and Management: Proceedings of the 3rd International Conference on Materials, Mechanics and Management (IMMM 2017)*, Trivandrum, Kerala, India, July 13-15, 2017, pages 247. CRC Press, 2019.

Conferences in 2019

1. **Manju G Nair and Abhilash Suryan R**, "Transdisciplinary Project Based Learning Models for Community Service ", in *IX World Engineering Education Forum (WEEF) on the theme Disruptive Engineering Education for Sustainable Development* , ITC Grand Chola, Chennai, India, November 13 to 16, 2019.
2. **Jyothish Abraham, Venugopal G, Rajkumar M R**, "Experimental Investigation On Effect Of Helical Grooves On Condensation Heat Transfer Performance Of Vertically Oriented Copper Tubes", in *IC-*

CHMT, DIAEE Department of Astronautical, Electrical and Energetical Engineering, "La Sapienza" University of Rome, Department of Engineering, Roma Tre University, September 03 to 06, 2019.

3. **Sunil, Kumar S, Neeraj M P, Ajay Kumar S, Mathews Johns**, "Numerical Modeling and Experimental Studies on a Wire Mesh Heat Exchanger." *4th Thermal and Fluids Engineering Conference, Las Vegas, NV, USA, April 14 - 17, 2019.*
4. **Martin Raju, Abhilash Suryan and Heuy Dong Kim**, "Numerical Study on the Performance Parameters of a Film Cooled LOX/GH2 Dual Bell Nozzle", *14th International Symposium on Experimental and Computational Aerothermodynamics of Internal Flows, Gdansk, Poland, July 08-11, 2019.*
5. **Subin S T, Dr. Rani S, Dr. Muhammed Arif, Renjish Vijay**, "A Review on Impregnation of PTFE using Electrophoretic deposition on Chrome Coated Aluminium Alloy", *KETCON 2019, Government Engineering College, Trichur, Feb 15 - 16, 2019.*
6. **Renjish Vijay, Dr. Rani S, Dr. Baiju Sasidharan, Dr. Muhammed Arif, Subin S T**, "A Review on Sol-Gel Coating Methods employed to enhance Tribological Properties", *KETCON 2019, Government Engineering College, Trichur, Feb 15 - 16, 2019.*
7. **Nakul Pradeep, Dr. Rani S, Sarath V S**, "Effect on the Tribological Properties of Rice Bran Oil with addition of Ginger Oil", *KETCON 2019, Government Engineering College, Trichur, Feb 15 - 16, 2019.*
8. **Sarath V S, Dr. Rani S, Nakul Pradeep**, "Effect on the Tribological Properties of Rice Bran Oil with Turmeric Oil as Additive", *KETCON 2019, Government Engineering College, Trichur, Feb 15 - 16, 2019.*
9. **Abhishek R John, Dr. Rani S, Dr. Mohammad Arif, E. Sneha, Renjish Vijay**, "A Study on the Tribological Properties of Epoxidized Rice Bran Oil", *KETCON 2019, Government Engineering College, Trichur, Feb 15 - 16, 2019.*
10. **Sajith Kumar S K, Binoosh S A**, "Ergonomic assessment of musculoskeletal risk in automotive spray painting task", *KETCON 2019, Government Engineering College, Trichur, Feb 15 - 16, 2019, (Co-author for the Best Paper in Operations Management stream).*
11. **Anoop G A, Binoosh S A**, "A Study on Musculoskeletal Disorders among Two-Wheeler Riders of Kerala State in India", *KETCON 2019, Government Engineering College, Trichur, Feb 15 - 16, 2019.*

Internal Exam Cell

The Exam Cell of Department of Mechanical Engineering (Exam Cell DME) conducts internal exams as per the KTU format and schedule. **Prof. Suresh Kumar V B** is the present faculty in charge. The other team members

are **Prof. Shafeeq and Prof. Jagajith**. The first internal exams for the odd semester of the B.Tech and M.Tech programmes were conducted during the period from 23-09-2019 to 10-10-2019. There were around 800 B.Tech students (S1, S3, S5 & S7) of Mechanical and Industrial Engineering disciplines and around 220 M.Tech students (S1, S3 & Ph.D scholars) of six streams written the test in various subjects. During the Exam days 14-16 class rooms were used for conducting the examination and around 20-24 faculty members were deployed for invigilator duty. Exam Cell DME conducted exams of around 50 B.Tech subjects (M&N) and around 40 M.Tech subjects. The second internal exams for B.Tech and M.Tech classes were conducted from 07-11-19 to 19-11-19.

K K Menon CAD/CAM Centre

K K Menon CAD/CAM Centre in Department of Mechanical Engineering, CET was inaugurated on September 20, 2019. This centre consists of a 5 axis automated mil with one set of tools and workstation worth Rs.35 lakhs. The entire setup was donated to CET by the family members of Er. K K Menon, an alumnus of CET 1951 Batch.

Timeline of ME Dept

Program	Intake	Start
B.Tech Mechanical	120	1939
B.Tech Industrial	60	1982
M.Tech Machine Design	18	1958
M.Tech Thermal Science	18	1958
M.Tech Propulsion Engg.	18	1983
M.Tech Industrial Engg.	18	1983
M.Tech Financial Engg.	18	2015
M.Tech Mfg. & Automation	18	2016

IMMM 2020

IMMM 2020 <http://immm2020.cet.ac.in> organized by College of Engineering Trivandrum has been announced. The important dates are:

Date of Conference : 5, 6, 7 March 2020
Dead Line of full Paper Submission: 15-01-2020
Notification of Acceptance : 27-01-2020
Submission of Camera-Ready Paper : 10-02-2020
Last date of Registration : 31-01-2020

ADVANCED THERMO-FLUID RESEARCH LAB (a special feature)

Over the decade, the subject of Fluid Mechanics and Heat Transfer has fascinated many academicians and industrialists due to its applications in various fields of Engineering. Keeping this objective in mind, the Advance Thermo Fluid Research Lab (ATFRL) was set up at College of Engineering Trivandrum in 2012 by Dr. Rajkumar M.R, Associate Professor, Department of Mechanical Engineering, College of Engineering Trivandrum with the guidance of Dr. Anil Lal, Professor, Department of Mechanical Engineering, College of Engineering Trivandrum and Dr.G.Venugopal. Associate Professor, Department of Mechanical Engineering, Rajiv Gandhi Institute of Technology, Kottayam. It was intended to open the window of latest developments in the area of Fluid flow and Heat Transfer to the students and faculties of College of Engineering Trivandrum. In the beginning of its establishment the lab faced lot of difficulties because of the lack of equipment and unavailability of funds. However, in the years followed, the lab slowly progressed and in 2014 with the joining of first Ph.D student(QIP) Chithrakumar V.K purchases were initiated with the QIP fund sanctioned to the QIP student. This resulted in the establishment of Interferometry lab and along with this equipments relating to flow and heat transfer experiments were also purchased. Based on these purchases an experimental setup was fabricated for analyzing the fluid flow and heat transfer in a vertical concentric annulus. In 2016, more M.Tech students and Ph.D students joined in this lab which resulted in purchase of number of equipments by utilizing different funds viz, DST(Department of Science and Technology- FIST) -17.5 lakhs, KTU-Best researcher of the year award -2017- 14.7 lakhs. This definitely enabled in improving the quality of lab in terms of equipments and content.

As the lab progressed, number of publications came up in good quality journals (Springer, Taylor And Francis, Elsevier, ASME Journals). The students as well as faculties associated with the lab also participated in International conference hosted by reputed Universities and Organisations within the country and outside. Among the publications, the notable one was with Electrical department wherein, an interdisciplinary work was done with Mabel Ebenezer, Associate Professor, Department of Electrical Engineering, College of Engineering Trivandrum. This work was to Study and Analysis of the effect of harmonics on the hot spot temperature of a distribution transformer using finite volume method. This paper was published in the journal Electric Power Components and System by Taylor and Francis. Continuing the research, in 2018, B.Tech student John Paul, who has done his undergraduate project in this lab got the best paper award at KETCON conference held at Government Engineering College Thrissur. The work was extended and John Paul got his paper published in Elsevier journal, International communications

and heat and mass transfer. John Paul is currently doing MS in Technische Universitat Munchen (TUM), German Institute of Science and Technology University, Singapore (off campus).

The value of any lab becomes elevated only when it is visible to the International research community. In this context, the ATFRL has collaborations with professors from International and National universities viz, Ali Cemal Benim, Professor, Department of Mechanical and Process Engineering, Duesseldorf University of Applied Sciences, Germany, Somchai Wongwises, Professor, Department of Mechanical Engineering, King Mongkut's University of Technology Thonburi and Lazarus Godson Asirvatham, Department of Mechanical Engineering, Karunya University, Coimbatore. At present the total number of students working in this lab is nine which include one Ph.D student, one Research Fellow, two final year M.Tech students, two pre final year M.Tech students and three B.Tech students. It is therefore indeed a great opportunity for all the students and faculties in this college to collaborate with this lab especially in the area of fluid dynamics and heat transfer so as to take the college of Engineering Trivandrum to the next level of education and research. The list of facilities, publications, students and associated faculties also attached along with this.

Associated Faculty Members

1. Dr. Rajkumar M.R
Associate Professor
Department of Mechanical Engineering
College of Engineering Trivandrum
2. Dr. G. Venugopal
Associate Professor,
Department of Mechanical Engineering
Rajiv Gandhi Institute of Technology, Kottayam
3. Dr. Anil Lal
Professor,
Department of Mechanical Engineering
College of Engineering Trivandrum
4. Prof. Dr.-Ing. habil. A. C. Benim
Center of Flow Simulation (CFS)
Faculty of Mechanical and Process Engineering
Duesseldorf University of Applied Sciences
+49 (0) 211 43 51 3504
5. Prof. Dr. Somchai Wongwises
Department of Mechanical Engineering,
King Mongkut's University of Technology Thonburi

6. Godson Asirvatham Lazarus, M.Engg., Ph.D.,
Professor and Head
Department of Mechanical Engineering
Karunya Institute of Technology and Sciences
(Deemed to be University)
Coimbatore, India 641114



Experimental Setup for Laser Holographic Interferometry
Associated Student Members

- (1) Chithrakumar V.K - Ph.D Scholar
- (2) Jyothish Abraham - Ph.D Scholar
- (3) Midhun Thomas - Research Fellow
- (4) Arun Issac - M.Tech Student (Completed)
- (5) Rozna Manzoor - M.Tech Student (Completed)
- (6) Sajith R.S - M.Tech Evening Student
- (7) Sidharth K. Pillai - Final Year M.Tech Student
- (8) Jishad .K - Final Year M.Tech Student
- (9) Chithramol M.K - Pre final year M.Tech Student
- (10) Biju. G - B.Tech Final Year Student
- (11) Adhil - B.Tech Final Year Student
- (12) Haritha - B.Tech Student
- (13) Aswani K.A - B.Tech Student
- (14) Anjitha P.S - B.Tech Student
- (15) Veena M.Sasi - B.Tech Student

Publications and Conferences

Number of International Journal publications- 12 (Elsevier, Springer , Taylor and Francis, ASME Journal), Number of International Conference Publications - 31 (Within the country and abroad)

List of Equipments

- (1) Thermo Weld
- (2) Liquid Bath Calibrator
- (3) Solid Bath Calibrator
- (4) Heat Gun
- (5) Hot Film Anemometer
- (6) Hot Wire Anemometer
(Constant Temperature - Dantec Systems)
- (7) High-Speed High-Resolution Camera
(32000 FPS- Max)
- (8) Data Acquisition System(Agilent)
- (9) Wireless Data Acquisition System(Hioki)
- (10) Smoke Generator
- (11) Cross Cut Adhesion Test Kit Master Paint Plate
- (12) Tubular Impact Tester

- (13) Low Speed Subsonic Wind tunnel
(Blower Type with variable flow)
- (14) Thermal Imaging Camera (FLIR)
- (15) Variable Frequency Drive(ABB)
- (16) Workstations – 3 Nos.(12 Core , 3.5 GHz)



Experimental Setup for Investigation of Combined Effect of Grooves and Super Hydrophobic Nano wires on Heat Transfer in Tubes



Experimental Setup for Flow and Heat Transfer In a Vertical Concentric Annuli with Rotating Outer Wall

Contact Information

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STUDENT ACTIVITIES

National Service Scheme (NSS)

Prof. Dr. Joy Varghese and Prof. Dr. Bringle C Das are the Faculty members in Charge. The website is <https://nss.cet.ac.in/>. The motto of NSS is 'NOT Me But You' <http://nsskerala.org/>. This students cell intended to promote the essence of democratic living, need for selfless service, appreciation of the other person's point of view and also to show consideration for fellow human beings. The NSS-CET is known as National Service Scheme (Technical Cell) and is very active in upholding the motto. One can see their past activities from their website. In the month of November they had organized a blood donation camp in CET. It was inaugurated by Prof. Dr. M Abdul Nizar, Dean (UG Studies) on November 8, 2019. This was the first of 80 blood donation camps organized in association with All Kerala Blood Donors Society to commemorate the 80th Anniversary of CET. 25 people (Students and Faculty members) donated on this day.

Career Guidance and Placement Cell

Prof. Dr. M R Rajkumar is the Faculty member in charge of Career Guidance and Placement Cell (CGPU). **Prof. Dr. K Sunil Kumar** coordinates placement activities and **Prof. Dr. Suresh Kumar E** coordinates training activities of CGPU. The website is <http://placement.cet.ac.in/>. The main objective of the cell is to place final year students in respectable organizations through campus recruitment. Other activities of the cell are coordinating industrial training, organize lectures, seminars, group discussions, mock interviews etc., and provide information and assistance to students regarding Job opportunities in India and abroad, self-employment, higher studies in India and abroad and competitive examinations like GRE, GMAT, TOEFL, GATE, CAT etc. The total job offers in the current academic year (2019-2020) till date is 715. AE-62, CE-49, CS-108, EC-124, EE-122, IE-45, ME-92, MCA-50, MBA-63. Some of the companies offered jobs were MRF, IBS, Nissan Digital, TCS Digital, L&T Infotech, Wipro Turbo, Infosys Engineering Services, CTS, TE Connectivity etc.

IEDC

Innovation and Entrepreneurship Development Cell (IEDC) of CET is led by **Prof. Dr. K Sunil Kumar** of this department. <https://iedc.cet.ac.in/> is the present faculty in charge. This is an active student-run cell under CET Center for Interdisciplinary Research (CCIR) that

seeks to create and promote innovation and entrepreneurship skills among the students of CET. The cell works in close association with Kerala Startup Mission, CET-TBI and other student clubs. The details of the programs conducted are available in the facebook page of IEDC <https://www.facebook.com/cetedc/>. IEDC-CET to honor CET's 80th year will be organising an industrial event E-Summit on February 1& 2, 2020 named as E-NOVUS 2020. Some of the past events are; (1) E-VOLVE, held at 4 pm on 30 August 2019 at CETAA Hall. It was aimed at giving a brief idea about the working of the cell to the new batch of students (2) Talk on 'Machine learning' by the renowned Prem Sankar C., Research scholar at Kerala University and the co-founder of Waggle Lab on 19th September 2019 and aimed at giving a brief idea about machine learning to young minds (3) Talk on "BUSINESS PLAN PREPARATION" on 03rd October 2019 by Mr. Manoj A S, senior knowledge officer at ICT Academy of Kerala.

Sports

Head of Department of Physical education had informed that CET had won the following events conducted by APJ Abdul Kalam Technological University.

1. Inter Zone winners in Softball Mens' competition
2. Inter Zone and A Zone winners in Table Tennis Mens' competition
3. Inter Zone and A Zone runners up in Basketball Womens' competition
4. Inter Zone third place and A Zone winners in Chess Womens' competition
5. A Zone winners and Inter Zone winners in Cricket Mens' competition
6. A Zone runners up in Shuttle Badminton Womens' competition
7. A Zone winners in Volley Ball Mens' competition
8. A Zone winners in Chess Mens' competition
9. A Zone runner-up and Inter Zone place 4 in Shuttle Badminton Mens' competition

The following students from Department of Mechanical Engineering had been the part of the various teams. Rithu Thulasidharan (S5M2), Biju G (S7M1) in Shuttle Badminton (Men); Ebin Joseph (S1M2) in Chess (Men); Saranjith M S, Athul A V, Rahul C, Sreeraj R M (all S7 ME), Anandhu C M (S7IE) Syam Chandran (S5IE), Arun Raj K V and Abijith Vijayan (S5 ME), Rohit Krishnan K (S3IE), Hari Krishnan S (S1ME) in Cricket (Men); Biju G (S7ME) and Anantha Krishnan (S5M1) in Table Tennis (Men); Anjana Kenath (S5IE) in Shuttle Badminton (Women); Sreeraj R M, Saranjith M S, Midhun C (S7ME), Anandu C M (S7IE) Rahul C, Nikil Augustine Antony, Ditto Ann Johns (S5ME) in Softball (Men); Abi Hussain (S7IE), Jishnu N (S7ME), Nikil S Asok and Ajsal P A in Volleyball (Men). Anandhu C M (S7IE) was selected as player of tournament and Anuraj K V (S5ME) as batsman

of tournament in the A Zone Cricket Mens' competition

MBaja

Prof. Sasi N, Associate Professor in ME is the Faculty in Charge. HERAKLES is the racing team from College of Engineering Trivandrum, participated in the national level FMAE BAJA competition held at Hyderabad in July 2018. The team consisted of more than 25 members from different batches, working towards a common goal- building the best ATV (All Terrain Vehicle) of the lot. The team consists of members gathered experience in the field by participating in similar competitions like Efficycle and other projects. BAJA is a design and fabrication competition of All-Terrain Vehicles where we have to design and build our own ATV from scratch. It is an intercollegiate competition held in India as well as worldwide and is one in which a multitude of skills are tested, ranging from managerial to designing. The ATVs are tested based on their ability to withstand the tough conditions in the arena.

The team members are selected based on written test, group discussion, personal interview and skill test. They are now professional team. Their first fabrication work started in February 27, 2018. Since then their progress was astonishing. The cost of the project was over 8.00 Lakhs and the student managed by donations from CET Alumni and Sponsors including M/s Mindpetal, Alethea, Indcoil, Flockforge, Indian Oil, Muthoot, CETAA 2018, FOX, Solid Works, Scholarian Racing.com.

1. Rank NINE on all India level in the SAE BAJA 2019 competition held at Punjab on March 7-11, 2019. The achieved this by securing SECOND position in Suspension and Traction, THIRD position in Sled Pull, SIXTH position in acceleration and TENTH position in endurance.
2. Runner up by getting first position for Design Evaluation, Second position in Acceleration as well as Endurance and third position in suspension and traction event in the ATV championship conducted by College of Engineering Adoor on the 6th and 7th of April 2019.

They can be contacted at: www.heraklescet.com or <https://www.facebook.com/heraklesracing/>

EBaja

Prof. Sasi N, Associate Professor in ME is the Faculty in Charge. They are a part of HERAKLE Team for electric vehicles. eBAJA is an event of equal importance and stature. Essentially, the engineering students get to build an electric vehicle on the same dynamics of the Baja rule-book. eBaja ATVs run on electric power using an electric motor powered by rechargeable lithium ion battery packs. The team officially inaugurated their e-ATV on June 26, 2019.

Team Farrago

Prof. Sasi N, Associate Professor in ME is the Faculty in Charge. The are team formed to participate in the SAE Efficycle Competition. Efficycle is an intercollegiate design competition for undergraduate and graduate Engineering students where teams have to design and fabricate energy efficient Hybrid-Human Powered -three wheeled-Electric vehicle. The last event held at Lovely Professional University on October 09 -13, 2018.

Team Excelerators

Prof. Praveen A, Assistant Professor in ME is the Faculty in Charge. The are team formed to participate in the FMAE - Formula Kart Design Challenge (FKDC) by fabricating the cart from scratch. FMAE or Fraternity of Mechanical and Automotive Engineers is a private company that conducts many design events. FKDC or Formula Kart Design Challenge is such an event which was conducted at Kari Motors Speedway Coimbatore on October 1, 2 and 3, 2019 . This event consisted of various tests a presentations whose evaluations are done by FMAE officials. The aim of the event is to help students develop various skills like technical expertise, problem analysis and solving. In addition the student learns a procedural method for fault identification and rectification.

The Team Excelerators was created in 2018 with 20 members. They had an informative session conducted by FMAE at Hyderabad. The engine used was Bajaj Discover 125 cc ST engine. The brake system and steering system taken were disc brake system and

" Some of the brightest minds in the country can be found on the last benches of the class room "

Dr. A P J Abdul Kalam

" I never teach my pupils, I only provide the conditions in which they can learn "

Albert Einstein

IMAGE GALLERY



Inauguration by NSS Blood Donation camp by Prof. Dr. M Abdul Nizar, Dean (U.G.)



from the NSS Blood Donation camp



ATV with IC Engine of CET (MBaja)



electric ATV of CET (eBaja)



Efficycle of CET (Farrago)



gocart vehicle of CET (Excelerators)

UP COMING FDP

DTE sponsored FDP on Recent Trends in CAD/CAM
from 16 December 2019 to 21 December 2019
Organized by Department of Mechanical Engineering,
College of Engineering Trivandrum



Inauguration of K K Menon CAD/CAM Centre



5 axis automated mil of K K Menon CAD/CAM Centre

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