2021-22 Odd semester

Volume 2 Issue 15

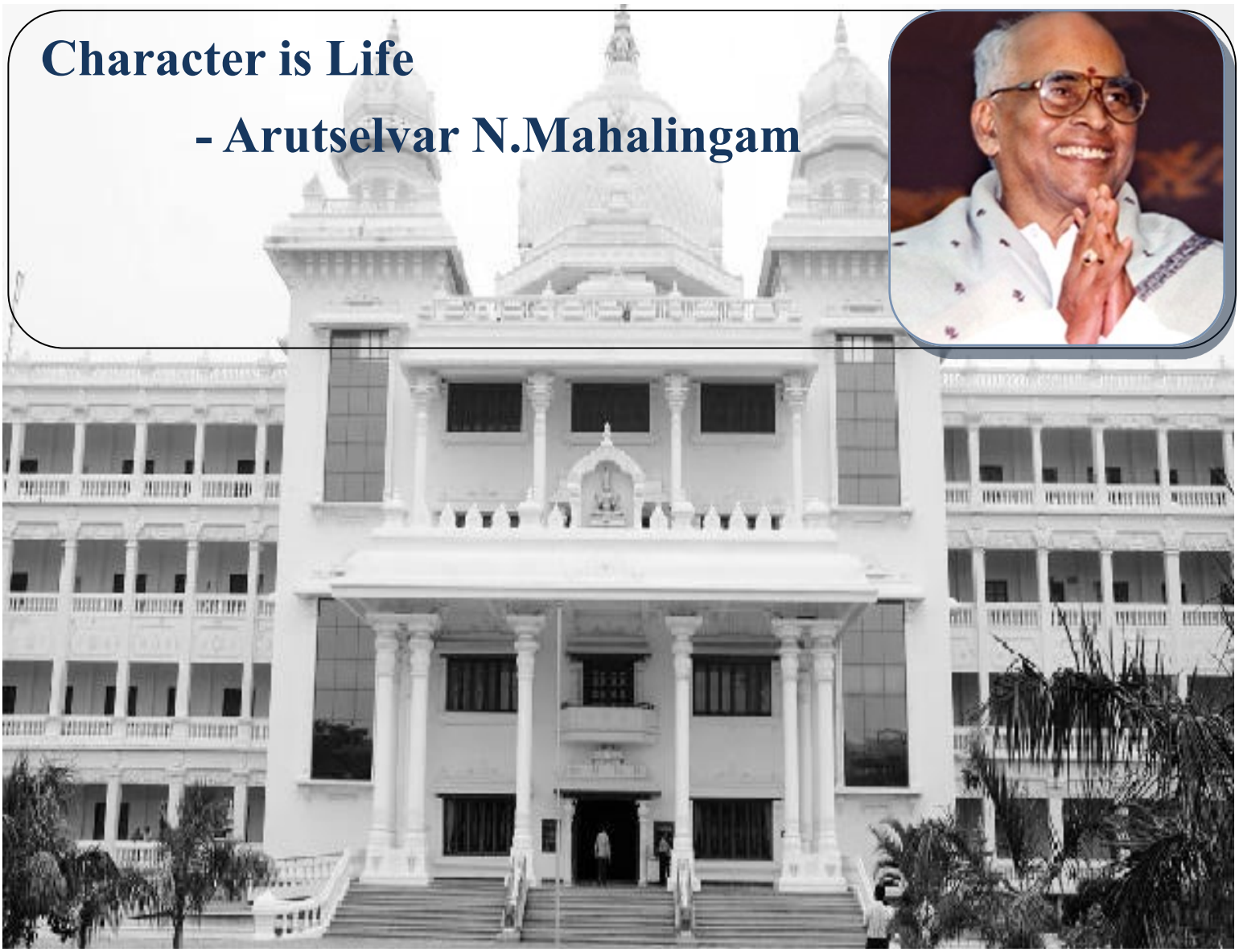
The Arrow

Department of Aeronautical Engineering Newsletter

KUMARAGURU
college of technology
character is life

Character is Life

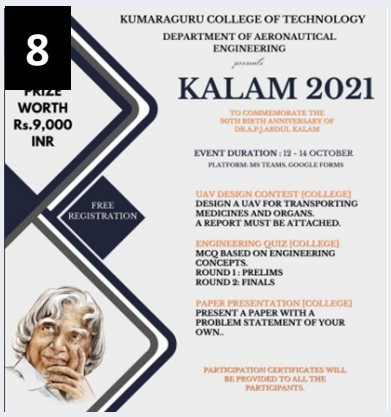
- Arutselvar N.Mahalingam



HoD's Message:

With immense pride, I share our recent achievements. Our MoU signings, impactful events, faculty publications, and vibrant Department Association activities have exemplified our dedication to excellence. As we gaze into the future, rest assured, our department's commitment to knowledge, innovation, and student enrichment remains unwavering. We are poised for even greater accomplishments.

In this issue



Agricultural drone Demo

The Aeronautical Department is excited to share that we have successfully designed and manufactured an agricultural drone entirely within our department. This drone boasts the capability to efficiently deliver water and pesticides to fields in accordance with real-time agricultural requirements.

On August 21, 2021, the Aero Modeling Club, in collaboration with our project coordinator, Mr. Darshan Kumar, conducted a formal flight demonstration for members of KIA Corporation. This event served as an opportunity to showcase the drone's potential and highlight the department's exceptional design talent to KIA Corporation representatives.

(MoU) with VALETH HIGH TECH COMPOSITE PVT LTD

We are thrilled to announce a significant achievement for our department. Dr. Sundararaj, our esteemed Head of the Department, and Mr. Rajkumar G traveled to Hyderabad on December 28, 2021, to formalize a momentous Memorandum of Understanding (MoU) with VALETH HIGH TECH COMPOSITE PVT LTD, a distinguished research establishment specializing in composite materials. This MoU marks a pivotal step forward in our department's commitment to fostering innovation and collaboration. We appreciate the dedication and vision of our team members in making this collaboration a reality. Here's to a future filled with exciting possibilities and breakthroughs!

Value Added Course

The course covered cutting-edge Non-Destructive Testing (NDT) techniques such as ultrasonic testing, radiography, and thermal imaging, along with their applications in aerospace, automotive, and heavy machinery industries. Hands-on sessions allowed students to gain practical experience using advanced NDT equipment under expert guidance. Interactive case studies highlighted real-world challenges and solutions in quality control and structural integrity assessment. Certificates were awarded upon completion, enhancing participants' technical skills and employability in the manufacturing sector.

Aeromodelling Club's Water Rocketry Event

A water rocketry event was organized as an engaging and fun-filled technical activity, designed to ignite the curiosity of students. This event was conducted under the umbrella of the Aero Modeling Club. The competition was exclusively open to KCTians, providing them with an exciting platform to showcase their skills and innovation. Participants received training and skill development in rocketry on November 26, 2021.

Communication Connect

The "Communication Connect" event, hosted by the Aeronautical Engineering Department Association, aimed to improve students' communication and soft skills. Speakers Mr. Pavan and Mr. Sreenivasan, both final year Aeronautical Engineering students, addressed around 50 attendees from various departments. Mr. Sreenivasan discussed the importance of soft skills and ways to develop them, while Mr. Pavan focused on communication development and its significance, offering practical tips for improvement. This event highlighted the vital role of these skills in personal and professional growth.

Communication Connect

AERFAS Description: This collaborative event with the Department of Fashion Technology at KCT aimed to provide students with insights into the workings of the KCT Placement Cell and its track record in successfully placing students in various job roles. Dr. Senthamarai Kannan, the Placement Officer of KCT, conducted an informative session during which he elaborated on the achievements of the placement cell.

Students from both the Department of Aeronautical Engineering and the Department of Fashion Technology actively participated, asking questions that Dr. Senthamarai Kannan addressed comprehensively. The event proved valuable for those students soon to enter the placement phase and informative for juniors looking to prepare for their future careers.

CARS project

We are proud to share that Dr. Premkumar PS, our esteemed Associate Professor, in collaboration with KCIRI (Kumaraguru Centre for Industrial Research and Innovation), has secured a prestigious research grant of Rs. 9 Lakhs for the CARS project, funded by ADE (Aeronautical Development Establishment), DRDO. This achievement highlights our department's commitment to cutting-edge research. The project aims to develop academia-industry collaboration. Congratulations to Dr. Premkumar for this remarkable accomplishment!

Technical Webinar on Dynamic Soaring: A Feasibility for UAV Flight Missions

A technical webinar titled "Dynamic Soaring: A Feasibility for UAV Flight Missions" was organized by The Institution of Engineers (India), Coimbatore Local Centre in collaboration with the Department of Aeronautical Engineering at Kumaraguru College of Technology, Coimbatore. The event took place on November 20, 2021, a Saturday, and was conducted through Google Meet.

The webinar commenced with a warm welcome from Dr. S. Shanmugam, Chairman of IE (I), Coimbatore Local Centre and Council member of IE (I), Kolkata. Dr. K. Sundararaj, Professor & Head of the Department of Aeronautical Engineering at Kumaraguru College of Technology, Coimbatore, offered felicitations.

The esteemed Chief Guest, Dr. Ranjith Mohan, an Assistant Professor in the Department of Aerospace Engineering at the Indian Institute of Technology Madras, delivered an enlightening lecture on the topic "Dynamic Soaring: A Feasibility for UAV Flight Missions." His speech proved to be highly motivating and left all participants feeling inspired.

The members expressed their appreciation for the valuable and effectively presented information shared during the lecture. The meeting drew to a close with a vote of thanks delivered by Dr. J. Krishnamoorthi, Honorary Secretary of IE (I), Coimbatore Local Centre.

Celebrating the Legacy of Dr. A PJ Abdul Kalam: A Tribute Event

We are proud to share with you the essence of a remarkable event that unfolded recently. It was not merely a gathering of young minds but a tribute to one of India's most beloved figures, Dr. A PJ Abdul Kalam, on his birthday.

The event served as a platform for students from various institutions across Tamil Nadu to showcase their technical knowledge and skills in general science and engineering. With a total of 80 participants, it was an extraordinary display of talent and enthusiasm.

The Highlights of the Event:

The event featured a diverse range of activities, including:

1. **School Quiz:**

A knowledge-packed quiz for the young minds of schools, igniting their passion for science and technology.

2. **Engineering Quiz:**

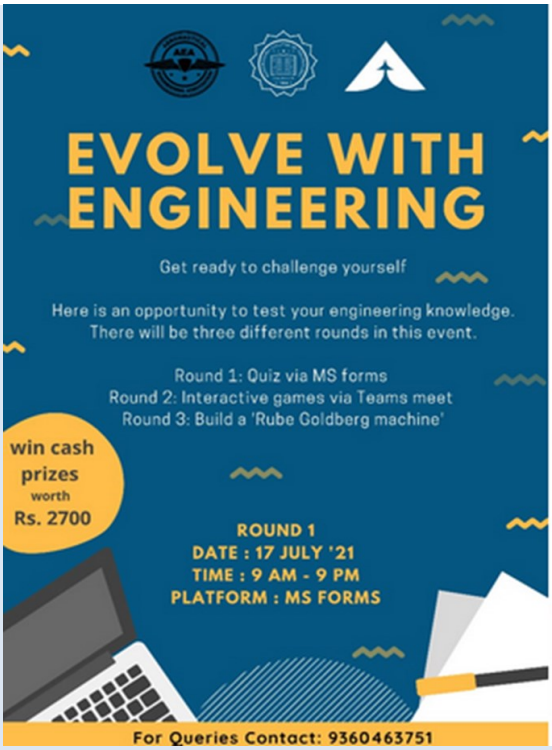
An intellectually stimulating competition for budding engineers to test their knowledge and problem-solving skills.

3. **Paper Presentation:**

A platform for students to share their innovative ideas and research, fostering intellectual growth.

4. **UAV Design Submission:**

An exciting challenge, where participants submitted their designs for Unmanned Aerial Vehicles (UAVs), showcasing their creativity and engineering prowess.



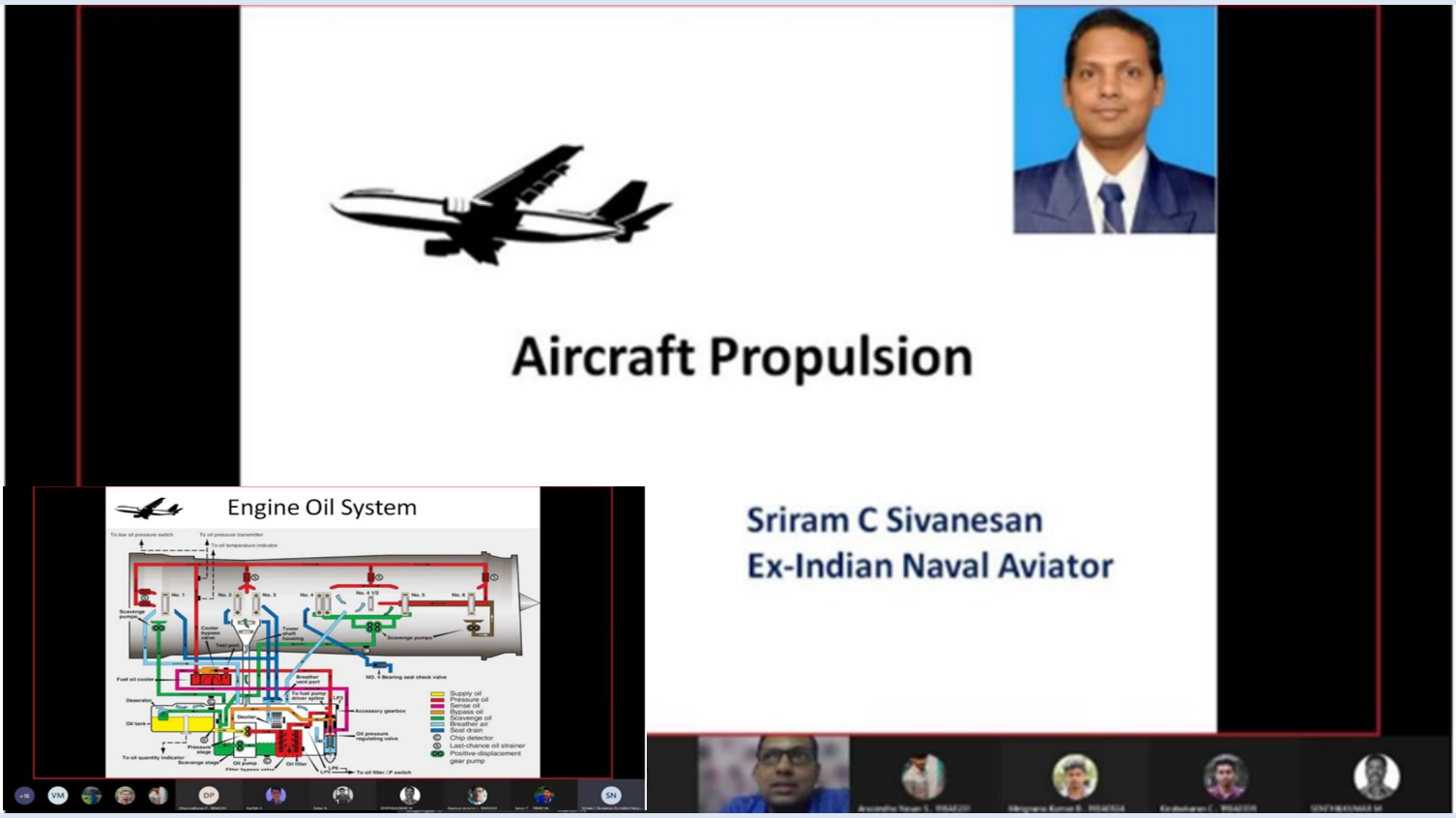
Departmental association

We are thrilled to share the success of our Departmental Association's latest event—an engaging and intellectually stimulating competition designed for KCT community. The event featured three dynamic rounds, each crafted to test participants' technical knowledge, problem-solving skills, and creativity. From brain-teasing puzzles to real-world engineering challenges, the competition provided a platform for budding engineers to showcase their talent. A big congratulations to all participants.

Sulur Airbase Seminar

Faculty members Raj Kumar G, Dr. M. Senthil Kumar, and Dr. K. Sundararaj had the privilege of participating in an enlightening seminar titled "Metrology in Today's World" held at the prestigious Sulur Air Base in Coimbatore.

Value Added Course on Maintenance, Practical challenges & Technical Documentations of Modern Aero- engines



The event was conducted on 12.09.2021,18.09.2021, 25.09.2021, 26.09.21 (Online Mode-MS Teams) and organized by Mr. M. Senthil Kumar of the Aeronautical department. The event had a total of 64 internal participants, including students and 2 faculty members.

The event began with a welcome address, an introduction of the resource person, Mr. Sriram C. Sivanesan, who serves as the Senior Executive – Material Service Manager at Lufthansa Technik Services India, Bengaluru. Additionally, a brief introduction to the Value Added Course was given by Dr. K. Sundararaj, Professor & Head of the Department of Aeronautical Engineering at KCT.

Mr. Sriram C. Sivanesan delivered a Value Added Course on Maintenance, Practical Challenges, and Technical Documentations of Modern Aero-engines. The event concluded with remarks and a Vote of Thanks provided by Mr. M. Senthil Kumar, Assistant Professor Sr.G, from the Department of Aeronautical Engineering at KCT.

Aeromodelling Club activity

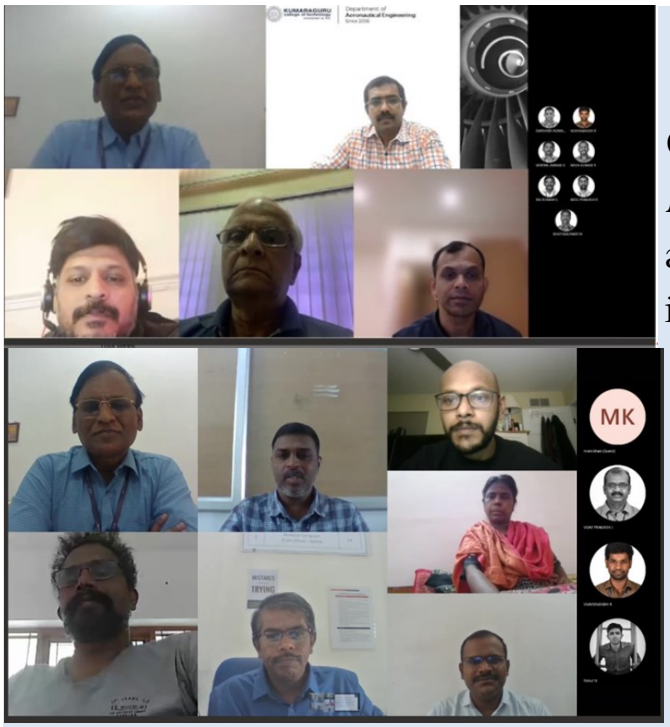
The event was conducted from 18-09-2021 to 19-09-2021 and was coordinated by Mr. Darshan Kumar J. The competition focused on design and comprised two rounds.

In the first round, participants were required to unlock the quiz, which featured 10 questions related to UAV (Unmanned Aerial Vehicle). The correct option number for each question served as the digits for the password required to access a document provided in the form.

The second round offered participants a choice between two types of design challenges: 1 - Mechanical design and 2 - Electrical design. Notably, all the students opted for mechanical designing. In this round, participants received a challenge design and were tasked with creating a replica.

Following both rounds, participants were ranked based on predetermined parameters. The first round's questions covered topics related to RCs (Remote Control devices) and drones, offering knowledge about drone rules, performance, and the structure of RCs.

In the second round, students' proficiency in CAD (Computer-Aided Design) was tested, assessing their skills in basic CAD functions such as sketching, extrusion, chamfering, and cutting. This exercise allowed students to evaluate their CAD knowledge and work on improving their skills



DAB and BOS meeting

On December 4, 2021, we held a Department Advisory Board meeting during which external academic members and industry experts provided invaluable insights and recommendations regarding curriculum, course delivery, and course assessments. A Board of Studies meeting took place on December 18, 2021, where detailed discussions regarding the syllabus content of various courses were conducted. The discussions focused on aligning our academic programs with emerging industry trends and technological advancements to enhance student employability.

Faculty Award

We are immensely proud to announce that Dr. Premkumar P S, our esteemed Associate Professor, has been honored with two prestigious accolades recognizing his exceptional contributions to education. He has been conferred the Best Faculty in Student Development award by MentorX, a renowned nonprofit organization dedicated to nurturing talent. Additionally, he has been featured on the "UleKtz Wall of Fame" by Ulektz International, ranking among the Top 20 Expert Faculties across Electrical, Electronics, Civil, Mechanical, and Aeronautical Engineering disciplines. These honors celebrate his unwavering dedication to academic excellence and student mentorship. Congratulations, Dr. Premkumar, on this well-deserved recognition!

List of Faculty activities during the 2021-22 Odd Semester

1. Vijayanandh R, Assistant Professor presented his paper at the ASME Gas Turbine India Conference 2021, organized by ASME, USA on the title "Investigations on Selection of Suitable Propellers for High Payload based Unmanned Aerial Vehicles using Advanced Computational Simulations".

2. Dr Premkumar P S Associate Professor presented his paper at SAE iTech organized by SAE on the topic "Evaluation of Various Turbulence Models for predicting the Flow separation and Shock location in CD Nozzle using CFD"

3. Vijayanandh R, Assistant Professor presented his paper at the ASME Gas Turbine India Conference 2021, organized by ASME, USA on the title "Lightweight material optimization of aquatic vehicles' propeller based on safety factor using hydro structural interaction simulation".

4. Vijayanandh R, Assistant Professor presented his paper at the AIAA Propulsion and Energy Forum - 2021, organized by AIAA, USA on the title "Comparative Estimations of Hydrodynamic Analysis on Unmanned Aquatic Vehicle's Propeller by using an advanced [CFD-MRF] Approach" on 09-08-2021

5. Mr. Vijayanandh R, Assistant Professor presented his paper at the AIAA Propulsion and Energy Forum - 2021, organized by AIAA, USA on the title "Optimization of High Payload Unmanned Aerial Vehicle's Propellers based on Energy Formation by using Computational Vibrational Analyses " on 10-08-2021

6. Mr. Senthil Kumar M presented his paper at the 2nd International Conference On Chemical, Bio & Environmental Engineering Chembioen 2021, organized by Department of Chemical Engineering,Dr B R Ambedkar National Institute of Technology, Jalandhar, Punjab, INDIA on the title "Optimization of High Payload Unmanned Aerial Vehicle's Propellers based on Energy Formation by using Computational Vibrational Analyses " on 20-08-2021

7. Mr. Vijayanandh R published a Scopus indexed paper titled "Comparative Hydrodynamic Investigations on Unmanned Aquatic Vehicle for Ocean Applications / Lecture Notes in Recent Trends in Mechanical Engineering" , Springer Conference proceedings.

List of Faculty activities during the 2021-22 Odd Semester

8. Mr. M Senthil Kumar attended STTP course for 14 days on Emerging Technologies in Electric Vehicles online from Bapatla Engineering College, Bapatla

9. Dr. Prem Kumar P S attended FDP 5 days on New Age Technologies for Innovative Solutions online from Jagannath International Management School, Vasant Kunj, New Delhi

10. Mr. R.Arun Kumar attended a refresher course on Universal Human Values from 30.08.2021 to 04.09.2021 organized by AICTE.

11. Mr. M Senthil Kumar published Scopus Indexed research article "Computational, Experimental and Surface Characterisation of Glass Fibre Reinforced Plastic Composite for Wind Turbine Blade Application" in Journal of Environmental Protection and Ecology (Vol. 22, Issue 2, pp. 602–616).

12. Mr. M Senthil Kumar published Scopus Indexed research article "Numerical and experimental performance estimations of the passenger train with waste collector near Windows" at 3rd International Conference on "Advancements in Aeromechanical Materials for Manufacturing", AIP Conference Proceedings 2317, 050007 (2021), https://doi.org/10.1063/5.0036183.

13. Mr. Vijayanandh R published Scopus Indexed research article "Conceptual Design and Multi-Disciplinary Computational Investigations of Multirotor Unmanned Aerial Vehicle for Environmental Applications" in Appl. Sci. 2021, 11, 8364. https://doi.org/10.3390/app11188364.

14. Mr. Naveen Kumar K published Scopus Indexed research article "Optimization of High Payload Unmanned Aerial Vehicle's Propellers based on Energy Formation by using Computational Vibrational Analyses, AIAA Propulsion and Energy 2021 Forum, August 9-11, 2021, Virtual Event, https://doi.org/10.2514/6.2021-3729

15. Vijayanandh R, Assistant Professor presented his paper at International Conference On Advancements In Electrical Electronics Communication Computing And Automation [Icaeca 2021], on the title Conceptual Design of High Endurance cum Hybrid Configuration based Personal Air Vehicles with Three-Axis Solar Tracker System.

List of Faculty activities during the 2021-22 Odd Semester

16. Mr. Vijayanandh R, Assistant Professor presented his paper at International Conference On Advancements In Electrical Electronics Communication Computing And Automation [Icaeca 2021], on the title Design, Dynamics, Development and Deployment of Hexacopter for Agricultural Applications

17. Mr. S.Senthil Kumar Published Scopus Indexed research article "Fuzzy Logic-Based Self-Tuning PID Controllers Using Parameters Adaptive Method for Stabilization of a Two-Axis Seeker Gimbal, IETE Journal of Research(published online). DOI: https://doi.org/10.1080/03772063.2021.1984319

18. Mr. Vijayanandh R published a book chapter on Structural Optimizations of Different Load-Carrying Members Based on Low Structural Performance Through Computational Structural Analysis in the book titled "Handbook of Research on Advancements in the Processing, Characterization, and Application of Lightweight Materials" IGI GLOBAL

19. Dr.K.Sundararaj Elected to the Committee of the Institution of Engineers, Coimbatore local center for the period 2021 -23 acknowledging his contribution to the research field and experience in the engineering community.

20. R. Arun Kumar, in his role as Assistant Professor II, attended a 5-day Faculty Development Program (FDP) on "Automotive Engineering Systems" from October 4, 2021, to October 8, 2021, at the national level.

21. R. Arun Kumar, in his capacity as Assistant Professor II, participated in a 6-day national-level Faculty Development Program (FDP) focused on "Recent Trends in Design of Experiments (DOE) and Optimization Techniques with Hands-on Training." The program took place from October 18, 2021, to October 23, 2021.

22. Mr. Arul Prakash R, serving as an Assistant Professor, had the privilege of attending a 6-day international Faculty Development Program (FDP) titled "AN Insight Into Futuristic Aerospace Propulsion " This program took place from October 15, 2021, to October 20, 2021, providing valuable insights into cutting-edge aerospace propulsion technologies.

List of Faculty activities during the 2021-22 Odd Semester

23. M. Senthil Kumar, Assistant Professor SrG, participated in a 6-day national-level Faculty Development Program (FDP) titled "An Insight Into Futuristic Aerospace Propulsion." This enlightening program took place from October 15, 2021, to October 20, 2021, offering valuable insights into the future of aerospace propulsion technologies.

KUMARAGURU
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COIMBATORE – 641 049

Department of Aeronautical Engineering

INSTITUTE VISION

The vision of the college is to become a technical university of International Standards through continuous improvement.

INSTITUTE MISSION

Kumaraguru College of Technology (KCT) is committed to providing quality Education and Training in Engineering and Technology to prepare students for life and work equipping them to contribute to the technological, economic and social development of India. The College pursues excellence in providing training to develop a sense of professional responsibility, social and cultural awareness and set students on the path to leadership.

DEPARTMENT VISION

To attain excellence and global reputation in Aeronautical Engineering Education and Research.

DEPARTMENT MISSION

M1: The department is committed to provide quality education in Aeronautical Engineering to students to build their career and do quality research and thus contribute to the field of Aviation and Aerospace.

M2: The department aims to prepare students for their higher studies and research to contribute to the advanced technological needs of Aeronautical engineering.

M3: To encourage faculty to update their knowledge and teaching-learning process through continuous learning.

M4: To undertake inter-disciplinary research to contribute and support the industry.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

The Program Educational Objectives (PEOs) of Aeronautical Engineering Undergraduate Program are to prepare the students:

I. To pursue a successful profession in leading organizations.

II. To pursue postgraduate degrees and conduct research at leading technological universities to contribute to the advancement in the field of Aviation and Aerospace industries.

III. Continue their professional development by utilizing educational and career building opportunities through their employer, educational institutions, or professional bodies.

PROGRAM OUTCOMES (POS)

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

and systems.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commitment to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life -long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOS):

PSO1: Apply fundamental principles of Aerodynamics, Structures, Propulsion, Materials, and Avionics to provide solutions to aerospace and non-aerospace industrial problems.

PSO2: Use the software packages in the design, manufacturing, testing and maintenance of aeronautical and aerospace based components