SAE ANNUAL REPORT 2022-23

SAE TKMCE COLLEGIATE CLUB,

TKMCE

ACTIVITIES OF SAEINDIA TKM COLLEGIATE CLUB

ANNUAL REPORT.

CONSTITUTION OF SAEINDIA TKM COLLEGIATE CLUB

● **Chairman:** Head of Department, Mechanical Engineering**.**

● **Senior Faculty Advisor**: A faculty nominated by the Head of Department, Mechanical Engineering.

● **Additional Faculty Advisor:** A faculty nominated by the Head of Department, Mechanical Engineering

● **Student Chairperson**: A Student Nominated by the Head of Department, Mechanical Engineering.

● **Student Vice-Chairperson**: A Student Nominated by the Head of Department, Mechanical Engineering.

● **Student Secretary**: A Student Nominated by Student Members of SAEINDIA TKM Collegiate Club.

● **Student Treasurer:** A Student Nominated by Student Members of SAEINDIA TKM Collegiate Club.

● **Student Reception Chair**: A Student Nominated by Student Members of SAEINDIA TKM Collegiate Club.

● **Student Programme Chair:** A Student Nominated by Student Members of SAEINDIA TKM Collegiate Club.

● **Student Publicity Chair:** A Student Nominated by Student Members of SAEINDIA TKM Collegiate Club.

● **Student Membership Chair:** A Student Nominated by Student Members of SAEINDIA TKM Collegiate Club

1. LIST OF OFFICE BEARERS

Office Bearers of SAEINDIA TKM COLLEGIATE CLUB of TKM COLLEGE OF ENGINEERING of the year 2022-2023

Sl No	POSITION	NAME
1.	Faculty Advisor	Ajukumar V N
2.	Student Chairperson	Vishnu Warrier
3.	Student Vice-Chairperson	Sidharth P
4.	Student Secretary	Muhammed Yaseen
5.	Student Treasurer	Sreehari
6.	Student Program Chair	Paul Sosi
7.	Student Reception chair	Harisankar
8.	Student Membership Chair	Ananthakrishnan
10.	SEC Member	Roshan
11.	Student Documentation Head	Athira
12.	Student Media Head	Manu V Nair
13.	First Year Representative	Neeraj Babu

ACTIVITIES OF SAEINDIA TKMCE COLLEGIATE CLUB (2022-23)

SAE TKMCE is a vibrant and dynamic organization that aims to promote innovation and excellence in mobility engineering among students. The organization provides students with a platform to develop their technical skills, participate in competitions, and interact with industry professionals. Our club has been actively involved in various activities and initiatives that have made a significant impact on the college and the community. Its commitment to promoting sustainable transportation, renewable energy, and social responsibility is commendable, making it one of the most respected and prestigious collegiate clubs in the region. In just few years, the laurels and recognition brought home by the students are worth admiration. Beginning its maiden journey in 2016, SAE TKMCE has come a long way. They provide students with an experience that simulates running a business or an organization and nurture valued skills including leadership, time management, project management, communications, organization, planning, delegation, budgeting, and finance.

SAE ISS Aero Design Challenge

SAE ISS Aero Design Challenge competition is intended to provide undergraduate and graduate engineering students with a real-life engineering challenge. Each team is required to conceive, design and develop a prototype of fixed-wing UAV, meeting the mission requirements. Students have to perform trade studies and compromise appropriately, to arrive at a design solution that will optimally meet the mission requirements while still conforming to the configuration limitations. The SAEISS Aero Design Challenge aims to promote and develop Indian expertise and experience in unmanned systems technologies at the university and college levels. Even small-scale unmanned vehicles are complex systems requiring a

well-planned and executed design approach. In addition, safety considerations are important factors in this competition as in any other vehicle design project. SAEISS Aero Design features two classes of competition - Regular and Micro. Two teams participated in ADC 2020 from TKMCE- Team Falcon and Team Spitfire in the Micro category.

Achievements

- 2019-20: Team Falcon secured 3rd position in Technical Presentation and obtained an overall ranking of 21 among 64 colleges of nationwide participation.

SAE BAJA


113


76

BAJA SAE is an intercollegiate design competition run by the Society of Automotive Engineers (SAE). BAJA SAEINDIA was launched in 2007 and from then on, nearly 300 teams from across the country compete in this extravaganza on an annual basis. The event is conducted in two stages - a virtual presentation event and the main event. The main event starts with the technical inspection followed by the brake test. The team can participate in other dynamic events if and only if the brake test is completed successfully. This is followed by the acceleration test, Suspension and Traction, Maneuverability event, and the Sledge Pull event. All this leads up to the big Endurance event an all-out race through a track. It is every participant's dream compete in the Endurance event. Points will be calculated according to the guidelines provided in the rulebook. A BAJA team was started in our college in the year 2016 and progressive growth in performance is evident. The entire team is divided into six departments, namely – Roll Cage, Suspension, Steering, Brake, Transmission, and Documentation- and the works were divided and done accordingly.

Achievements

- 2016-17: Car Number 85-First team to compete.
- 2017-18: Car Number 113-Ran the endurance event but couldn’t complete due to suspension failure.
- 2018-19: Car Number 76 - Secured AIR 5 and 1 st in Kerala.
- 2019-20: 47th rank in the virtual event from among 382 participants.

SAE EFFICYCLE

Efficycle is a 5-day long intercollegiate design competition for undergraduate and graduate students where teams have to design and fabricate an energy efficient entirely human powered three-wheeled vehicle. The vehicle must be aerodynamic, highly engineered and ergonomically designed. The design should be commercially viable as a product and should be attractive to the consumers because of its visual appearance, performance, reliability and ease of operation. The event is undertaken to promote the objective of providing opportunity to the students to conceive, design and fabricate a three-wheel configuration vehicle powered by human-electric hybrid power and capable of seating two passengers catering to the day to day mobility needs.

Achievements

- 2017-18: BLACK MAMBA - Secured AlR 44 and 1 st in the state of Kerala.
- 2018-19: BLACK MAMBA- Secured AIR 39 and 2 nd in the state of Kerala
- 2019-20: BLACK MAMBA- Secured AIR 21 and 2 nd in the state of Kerala
- 2020-21: BLACK MAMBA- Secured AIR 13 and 2 nd in the state of Kerala

SAEISS ELECTRIC TWO WHEELER DESIGN COMPETITION

The SAEISS Electric Two Wheeler Design Competition 2019, tasks the students to think, analyse, design, develop, build, test and present in series of events. First of its kind in India, the Competition ensures that Students gets a realistic 360-degree workplace experience. The objective of ETWDC 2019 is to design, engineer, prototype and demonstrate an Electric Two Wheeler to carry one person, with a price tag of ₹60000, based on an annual sale of 25000 units per year.

Achievements

- 2018-19: Secured AIR 3 for technical presentation.

SAE TRACTOR DESIGN CHALLENGE

SAE TDC is meant to design, engineer and prototype a 17 HP general purpose chassis based agricultural tractor with a potential use in the field of recreation, small farming and municipal use with a price tag of 2.7 lakh based on an annual sale of 20,000 units per year and demonstrate the same on a limited test track. As the competition name suggests, the focus is centered around the design features and calculations. The design in turn, is documented by way of a complete manufacturing drawing of all the parts and assemblies; with individual costing and engineering materials, accompanied by a project report.

Achievements

- 2017-18 STALLION - AIR 4, Kerala 1 st ; Design - 3 rd
- 2018-19 TAURUS - AIR 2, Kerala 1 st ; Design - 1 st

SAE SUPRA

SAE-SUPRA is India's biggest formula student competition, organized by the SAEINDIA. The event is a platform for students to apply their engineering skills to design and construct a formula category vehicle as per defined performance and safety specifications. SUPRA comprises a series of static as well as dynamic events spread over a span of five days, concluding with a final endurance run. The garage of TKM has a great legacy; despite winning at many of the prestigious competitions like SAE-BAJA, SAE-TRAKTE, but it took till 2019 for TKM to put forth her first race car MACH.1.0. In 2017 some students came together with the intention to make the first race car hit the competition at SAE-SUPRA 2019. The idea soon gained traction among students as well as faculty, and with that spirit, the first team was formed. All the hardships were overcome by sheer hard work and perseverance of team members.

Achievements

- Even though our overall ranking was a distant 90 among a total of 120 teams, it was a pretty good result by making a C car from the amateur team.

FORMULA BHARAT

Formula Bharat was a competition that we were pushed into participation thanks to an ill-informed early registration, nevertheless the exposure was colossal building on the experience from the previous supra and were one of the very few first time teams to incorporate custom springs and pushrods into the design but lack of funding and understanding of the scale of the competition was put on full display as the team of SAE

Supra went for the competition and saw the mountain that had to be scaled even though the team cleared a few static rounds they weren't able to clear the technical inspection.

Achievements

- 2017-19: AIR 32 in cost presentation, AIR 33 in design presentation, AIR 39 in business presentation and an overall rank of 41 among 80 teams.

SAE TKMCE 2022-23

Our academic year of 2022-23 has commenced with the appointment of a remarkable team of enthusiastic student leaders who have come together to form an exceptional executive committee. The ExeCom members include
Chairman : Vishnu Warrier
Vice chairman : Sidharth P
Secretary: Yaseen
Treasurer: Sreehari
Doc head: Athira A
Program chair: Paul Sodi
Media Head: Manu V Nair
Membership chair: Ananthakrishnan
Reception chair: Harisankar
SEC Member: Roshan
First year rep: Neeraj.

Collaborating closely with the faculty advisor and other members of the organization, they strive to foster a culture of innovation and excellence in the field of mobility engineering

among the student body. Together, they provide ample opportunities for professional development and networking, ensuring that every member of the team is equipped with the skills and knowledge necessary to succeed in their respective careers.

Activities of SAE completed so far in the academic year 2022-23 are enlisted:

Membership drive:

In the year 2022-23, SAE TKMCE orchestrated its customary and highly anticipated annual membership drive for automobile enthusiasts in July. The purpose of this event was to attract and enlist fresh individuals to the ranks of the organization, thereby expanding its membership base and strengthening its overall impact and influence. Through a variety of strategic and engaging initiatives, SAE TKMCE sought to appeal to potential members and convey the many benefits and opportunities that come with being a part of this esteemed group. The drive was a huge success and the new members were provided with an orientation session to familiarize them with the organization's goals, objectives, and upcoming events. The membership drive was coordinated by Ananthakrishnan.

ENVISION:

It was a fantastic 3D modeling and printing workshop, combined with an exhilarating competition, all under the amazing name of Envision. This event was truly a remarkable showcase of creativity and innovation, where participants had the chance to learn and practice the latest techniques in 3D modeling and printing. Through a series of engaging activities and demonstrations, attendees were able to gain invaluable hands-on experience in the creative process of designing and bringing their ideas to life. With an array of cutting-edge software and technologies at their disposal, participants were able to explore the endless possibilities of this innovative field and unleash their inner creativity like never before. The workshop was expertly conducted by Professor Mohit Dadu and Mr. Muraleekrishnan, who brought their wealth of knowledge and experience to the event. . It was conducted over in two phases and consisted of various sessions on 3D modelling and printing. The initial phase was on July 21st and 22nd, participants were familiarized with 3D modelling software such as Tinkercad and Fusion 360. Additionally, they were briefed on the fundamentals of 3D printing, which encompassed a diverse range of printers and materials. During the 2nd phase held on July 25th, the participants were given the opportunity to apply their newly acquired knowledge in a practical setting. A competition was held as a culmination of the workshop and was open to all participants. The participants were expected to solve a real-world application challenge by designing a suitable component. Vaishnav Anoop has emerged as the winner, bagging the first prize and a whopping 2k in prize money. The second and third prizes were also highly contested, with Ehsan and Lakshmi s emerging as the worthy recipients. The session was an electrifying experience that left everyone feeling inspired and eager to create even more amazing things in the future.The event was handled by Vishnu Warrier and Sidharth.

Bicycle design competition:

SAE TKMCE, the esteemed collegiate club, has recently organized a highly successful and engaging recruitment drive. The primary objective of this drive was to select the most skilled and talented individuals for their highly esteemed Bicycle Design Competition team, popularly known as Team SPOX. The aim of the recruitment drive was to meticulously identify and handpick exceptionally skilled and passionate engineering students who had the potential to make a significant contribution to the team's triumph in the upcoming competition. This recruitment drive was an opportunity that was open to all engineering students from TKMCE, and we were seeking individuals who were truly invested in the art of bicycle design. To apply, interested candidates were required to fill out a comprehensive online application form and submit their resume, along with a brief yet compelling statement of purpose that demonstrated their keen interest and exceptional skills in the field of bicycle design. We were searching for individuals who were not only technically proficient but also deeply enthusiastic and committed to the task at hand. The shortlisted candidates were invited to a personal interview, where they had to demonstrate their design skills, knowledge of bicycle components, and ability to work in a team. The formation of Team SPOX has set the stage for an exciting and challenging journey towards creating a winning bicycle design, showcasing the technical prowess and innovation of TKMCE students.

Electric two-wheeler design competition:

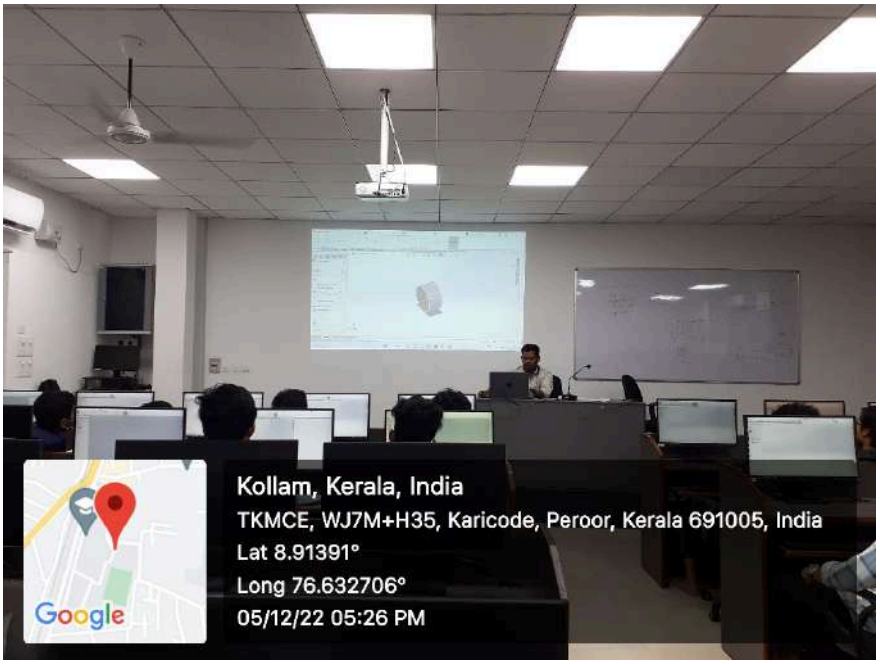
The exhilarating recruitment drive for Team Vegha, an electric two-wheeler design competition, was conducted with great fervor and enthusiasm by SAE TKMCE. The aim was

to attract and recruit highly talented students who possess an unwavering passion for electric vehicles and are eager to work on a revolutionary project that has the potential to make a significant impact on our environment. This was an incredible opportunity for students to showcase their skills and creativity in a challenging yet rewarding environment, and we were thrilled to witness such a remarkable turnout of students who shared our vision and mission. . The drive was open to all tkm students who had a passion for electric vehicles and were interested in working on a challenging project. The team received a large number of applications, which were carefully reviewed to shortlist the most suitable candidates. The selection process was fair and transparent, and the candidates were evaluated based on their technical knowledge, problem-solving abilities, and communication skills. The team is working on designing an electric two-wheeler that is eco-friendly, efficient, and affordable.This was coordinated by Anfal and Hemanth.

ENVISION 2.0

SAE TKMCE, the Society of Automotive Engineers (SAE) collegiate club, recently conducted a Short-Term Advanced Course on 3D Modelling and Printing called Envision 2.0. The course aimed to provide hands-on training and practical knowledge in the field of 3D modeling and printing, which has become increasingly important in the engineering and

manufacturing industries. It commenced on November 28 and was conducted in a series of sessions handled by well-experienced professionals. The course curriculum covered various topics, such as Advanced surface and solid modelling techniques, conversion of CT scans to 3d models, surface modelling, and many more. The Short-Term Advanced Course on 3D Modelling and Printing conducted by SAE TKMCE was a great success, providing valuable knowledge and practical experience to the participants. The course equipped them with the skills and expertise needed to design and develop functional prototypes and products using 3D modelling and printing techniques. The course also played a vital role in promoting innovation, creativity, and entrepreneurship among the engineering community, showcasing TKMCE's commitment to fostering excellence in engineering education.



TIER EVENTS

Tier Event contests are primarily held to showcase students' technical, design, fabrication, and problem-solving abilities. It is also a platform for networking and knowledge exchange. Tier Events are crucial in encouraging students to pursue careers in the automotive sciences. For the year 2022-23 we have successfully conducted 6 events so far which include:

- **Structural and Dynamic Analysis**

Structural analysis is a comprehensive determination to assure that the deformations due to load in a structure will be satisfactory and lower than the permissible limits, and failure of the structure will never occur. It is a method by which we find out how a structure or a member of a structure behaves when subjected to different loads. The results of the analysis are used to verify the structure's strength for its uses. Structural analysis is thus a key part of structural engineering. In this event, our main focus was to give an understanding of the basics of structural analysis. Various core aspects of analysis were introduced. These include:

- Theory of machines
- Engineering mechanics,
- Engineering materials
- Fundamentals of analysis

All these topics were covered and the participants' abilities were evaluated through a quiz competition. There were 10 MCQ questions with equal weightage for all the topics stated above and 10 minutes were given for solving the answers by choosing the right option. The team size allowed was 3 members per team and 5 teams from all years participated. The event was coordinated by Harisankar(M6) and Rohan(M8). The results are as follows:
First prize: Akhil M, Shyam Kumar K, and Sreerag PM of 4th-year
Second prize: Godwin Francis and Noel Rebu Sam of 3rd year
Third prize: Subin Suresh and Jithu SI of 3rd year

- **Computer aided manufacturing competition**

The CAM competition was a challenging platform that required the participants to showcase their skills in designing and manufacturing a critical component of a vehicle's braking system.The CAM competition involved designing a brake disc model typically involving several rounds. The first round was a report submission that tested the participants' knowledge of CAM technology, including programming and machining techniques. The participants then move to the next round, which involves a practical examination.

The practical examination requires the participants to use CAM software to design and manufacture a brake disc model that meets the specifications provided by the judges. The judges evaluate the participants based on the accuracy and quality of the component produced, the efficiency and optimization of the manufacturing process, the creativity and innovation in the design, and the ability to troubleshoot and solve problems during the manufacturing process.

The participants in the brake disc model CAM competition are evaluated based on various criteria. The judges evaluate the accuracy and quality of the brake disc model produced by the participants. The evaluation also considers the efficiency and optimization of the manufacturing process, including the programming of the CAM software and the use of CNC machines. Additionally, the judges evaluate the creativity and innovation of the design, including the ability to incorporate unique features to enhance the brake disc's performance.

The CAM competition involving the brake disc model is a challenging platform that tests the participants' skills and knowledge in designing and manufacturing a critical component of a vehicle's braking system. The competition promotes innovation, excellence, and advancement in the field of manufacturing and highlights the significance of CAM technology in modern manufacturing.
The team size allowed was 3 members per team and 6 teams participated. The event was coordinated by Ehsan(M6) and Roshan Roy(M8). The members of the winning team were Godwin Francis and Royce R all from the 3rd-year mechanical department.

- **Auto Quiz**

The event's purpose is to check the participants' general knowledge related to the automotive and related subjects mentioned below.

• History
• Places
• Personalities
• Technologies
• Companies
• Vehicle types and specifications
• Statistics of vehicles and so on
• All Automotive related subjects

The quiz may be conducted on the following rounds. For rounds other than rapid-fire 30 seconds on direct and 15 seconds on a pass. For rapid fire round 120 seconds for 10 questions. A total of 28 participants were there and the event was coordinated by Aswin Sasidharan (M4A) and Thasnim NS (M4A). The event was conducted on the 1st of March 2023 at 4:30 pm in offline mode.

Winners of AUTOQUIZ are, 1st- Akhil M (M8), Rohan George (M8), Shreerag PM (M8), 2nd- Karthik RS (M6), Subin Suresh (M6), 3rd- Akshay Ashok (M4), Albin K Varkey (M4), Reeba C Manoj (M4).

● Material Identification

The purpose of the event was to facilitate the identification of materials used in automobile products and components. This competition was designed to showcase the range of materials skills employed by quality departments in various automotive industries. The event was conducted offline on the evening of March 13th and participants competed individually. Each participant was given one minute to identify the material of each part and to record its properties. The material identification tier 1 event was completed within 30 minutes.

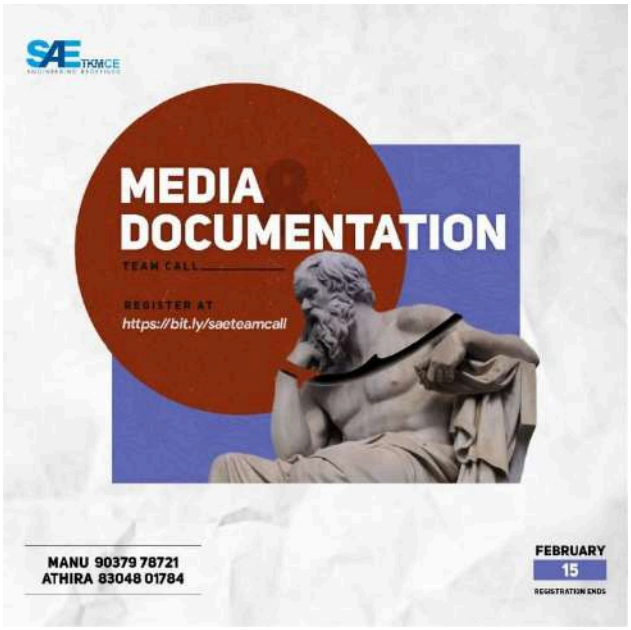
Based on the accuracy of identifying the correct material from the given automobile part and the ability to specify its properties, participants were evaluated. It is with great pleasure that we announce the winners of the event as follows:

1st place: AFIN MUHAMEED
2nd place: ABHIJITH R
3rd place: AHAD J

● Python Programming

A Python programming competition was organized on 7th March 2023, as part of SAE tier events. The mode of the event was offline, with a net participation count of 24 participants, clubbed into teams of the utmost 3 members each. The main aim was to give an application of problem-solving methodologies and coding knowledge by drafting the basic flow chart and logic for a given python problem.
The competition was held for a duration of 1.5 hours, to solve three programming problems in python language.
The program was coordinated by Muhammed Ajnas (3rd-year cs) and Amal Jith (2nd year Mech).
Winners announced are as follows-
1st position- Eldho Sajan John and Arjun P Nair
2nd position- Afsalu Rahman C, Ahamed Raees and Derin John Antony
3rd position- Akash K V, S Suraj and Sooraj S J

In addition to the above-mentioned, we have recruited the Media and Documentation team for the complete assessment and record keeping of SAE TKMCE's work.



The events that are anticipated to be completed by the end of this academic year include :

- Industrial Visit: Internship plays an important role in gaining real-time knowledge acquisition and attaining practical skill goals required for professional life. SAE TKMCE with a motive of providing students more exposure to industrial works has been decided to bring forth an internship program for the students of Mechanical engineering department. Proceedings for the same are done parallely.
- Magazine : In continuation to the SAE Magazine launched in the pandemic, TESSERACT VOL1, we are planning to release TESSERACT VOL 2 which involves a dimension out if the normal textbook and a better view of the outer world.