



WHEELS OF INNOVATION

WHERE ENGINEERING MEETS THE ROAD

DEPARTMENT OF AUTOMOBILE ENGINEERING
SCMS SCHOOL OF ENGINEERING AND TECHNOLOGY



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Three of our own present research at TFEC 2024, Corvallis, Oregon

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Tracing the shop-floor instincts that shaped a new generation of engineers

EDITORIAL BOARD

WHEELS OF INNOVATION

2025-26 ACADEMIC YEAR

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ABOUT THE DEPARTMENT

Established in 2004, our Department of Automobile Engineering is not just about traditional learning. We immerse our students in the latest trends through seminars, workshops, and interactions with industry experts. With a robust UG program welcoming aspiring engineers each year, we ensure you're not just academically sound but industry-ready. Our value-added courses each semester bridge the academic-industry gap, empowering you to undertake core domain projects. Dive into hands-on experiences in our expansive 5000 sq. ft Automobile Lab, equipped for all your innovative endeavours. And it's not just about studies; our associations 'SAEIndia Collegiate club of SCMS' & 'TORQUE' offer platforms for you to organize and participate in riveting technical events. Join us, and find yourself in esteemed companies like Mahindra, JK Tyres, TVS, and Bosch after graduation.

VISION & MISSION

VISION

To be a nationally renowned department developing automobile technocrats through service learning, research, and innovation.

MISSION

1. Provide strong fundamentals and practical skills in Automobile Engineering.
2. Promote service learning, research, and innovation in mobility technologies.
3. Develop techno- leaders with ethics and lifelong learning skills.



Steering the Future of Mobility

MESSAGE FROM THE HOD



Welcome to the latest edition of our department magazine. The automotive industry is standing at a historic crossroad. As we witness the aggressive global pivot towards green mobility, electric vehicle (EV) platforms, and smart, connected systems, the role of the automotive engineer has never been more dynamic.

At the SSET Department of Automobile Engineering, our mission is to seamlessly bridge the gap between foundational mechanics and next-generation technology. We believe that true innovation requires a strong grounding in core principles. By mastering essential concepts—from thermodynamic cycles and internal combustion engines to advanced manufacturing processes and material science—our students build the necessary scaffolding to tackle complex modern challenges.

This foundation is brilliantly showcased in the real-world achievements of our students, whether it is Team Atom United fabricating a competitive electric two-wheeler from scratch, or the vibrant technical initiatives spearheaded by the newly inaugurated Tech Torque club.

This magazine reflects the passion, resilience, and technical prowess of our budding engineers and dedicated faculty. I commend the editorial team for curating such a diverse array of technical insights and inspiring campus stories.

As you turn these pages, I hope you share the same excitement for the future of mobility that drives our department every single day. Keep learning, keep innovating, and continue to push the boundaries of what is possible.

Dr. Jenson Joseph E.

Professor & Head of the Department
Department of Automobile Engineering
SCMS School of Engineering & Technology



Wheels of Innovation

EDITORIAL

Welcome to the 2026 edition of Torque & Tread. As we look out from our campus here in Kizhakkummuri, Kerala, the landscape of mobility is shifting faster than ever before. The transition from traditional IC engines—a core part of our mechanical thermodynamics syllabus—to advanced EV skateboards is no longer a distant dream. It is our present reality.

In this issue, we bridge the gap between our rigorous academic curriculum and the thrilling open road. From technical deep dives into Advanced Driver Assistance Systems (ADAS) to travelogues documenting the rugged beauty of the Western Ghats on two wheels, this magazine celebrates the spirit of engineering.

We also explore the creative side of our students with original fiction and poetry. Because engineering is not just about calculating the Carnot cycle efficiency; it's about imagining the future.

Chief Editor

Mr. Adithyan J. Biju
2022-26 Batch, AU

THE PIT CREW DIARIES

Design, Fabrication, and Finance: The Making of Our 2nd Electric Two-Wheeler

The budding engineers of Team Atom United from SSET built their second electric two-wheeler and took it to the National EV Scooter Challenge—continuing exactly where they left off, but with a massive point to prove.

The first venture to the EV challenge just wasn't enough. The team needed to return to the arena with a singular, ambitious goal: conceptualizing and building a brand new scooter from scratch that would be ten-fold better than its predecessor. Atom United reunited with a mentality and drive like never before.

The New Atom United Roster

The new Atom United team was composed of the best minds from across different disciplines. Bringing in new members allowed for more advanced mathematical modeling and unique fabrication techniques.

Guided through highs and lows by Team Leader Ashwin S Kumar, the project took shape. Advaith Deepu co-led the conceptualization and design phase alongside Ashwin. The mastermind handling the backbone calculations was Parameshwaran. When it came to the monumental task of sourcing specialized EV parts, Clement GN and Christo John took the wheel, while MK Vijaya kept the notoriously difficult project finances in check. Finally, the mechanical crew responsible for bringing the vehicle alive on the workshop floor consisted of Abhinand K, Adithya NK, Amal Santosh, and Pranav T J.



From the very beginning, this project was anchored by a clear vision: focus on new innovations that could translate into a viable business venture. It didn't take long for these ideas to materialize into multiple CAD models, 3D-printed miniatures, and countless hand-drawn sketches scattered across the lab.

Then, workshop time rolled around. It is the most time-consuming, confusing, yet vital phase for any engineering crew. Countless sleepless nights were spent under the harsh lights of the Automobile workshop.

A Shift in Focus

This second venture was not just about iterating on an old design; it was about professionalizing our entire approach. We shifted our focus entirely. The team concentrated on refining the core technology for efficiency and track performance, while simultaneously developing a comprehensive business plan to transition the project from a purely academic college exercise into a marketable product. This involved meticulous market research, cost optimization, and actively exploring potential industry partnerships.

This year, the stakes were much higher than just a competition entry. Our ambition was to validate our design not only on the tarmac but also as a sustainable business proposal. The core innovation of our second two-wheeler served as the foundation of our pitch, proving that student engineering dreams could lead to legitimate entrepreneurial opportunities.

The Roadblocks

The challenges were immediate and dramatic. Just as we breathed a collective sigh of relief after fabrication, the real journey began.

While transporting the two-wheeler to the competition site on a train, a major last-minute disaster struck—a critical component suffered severe transit damage that stopped the vehicle from running entirely. With the clock ticking and the competition site across the country, a heavy decision was made. The team split in two.

Half of the team stayed behind, returning immediately to the college workshop to source and fix the damaged part. The advance team continued the journey, arriving at the destination with a non-functional prototype. For the next few grueling days, the advance crew had to navigate initial technical inspections, deliver presentations, and manage event setup relying on nothing but hope and late-night phone calls. Finally, the rear guard arrived, exhausted but successful, with the repaired component in hand to revive the electric two-wheeler.

The Cost of a Dream

Electric vehicles do not come cheap. Advanced motors, high-capacity batteries, and lightweight materials stretched far beyond what our meager student budget could handle. Without sponsors in the early stages, we made the hard call to finance the project out of our own pockets.

It was incredibly tough—but it taught us the true, tangible cost of a dream.

Giving up was never an option. We learned that sometimes, you have to carry the financial and physical weight first to prove that your vision is worth believing in. Next time, we'll walk onto the track even better prepared—and perhaps, with sponsors who believe in us just as much as we do.

By **TEAM ATOM UNITED, SSET**

Revving Up Innovation and Culture: Inauguration of Tech Torque and Fusion Torque

The Department of Automobile Engineering at SCMS School of Engineering & Technology (SSET) marked a significant milestone with the inauguration of its Domain Club, "Tech Torque," and Cultural Club, "Fusion Torque," on January 7, 2026. The full-day event, held at the Administrative Block's Seminar Hall from 9:00 AM to 3:45 PM, saw enthusiastic participation from 85 students across the S2, S4, S6, and S8 Automobile Engineering batches.

Dual Vision: Technical Excellence and Holistic Growth

The newly inaugurated clubs represent a dual approach to student development. "Tech Torque" focuses squarely on technical skill development, industry-oriented learning, and hands-on workshops relevant to modern automotive engineering. Conversely, "Fusion Torque" is dedicated to encouraging creativity, teamwork, leadership, and holistic personality development through cultural and social engagement.

The inaugural ceremony commenced with a Welcome Address by Dr. Jenson Joseph, followed by a Presidential Address delivered by Dr. Anitha G Pillai, Principal of SSET. The event also served as the platform to officially introduce the TORQUE Automobile Engineering Association's office bearers for the 2025-26 academic year. The newly appointed student leadership includes President Mr. Amal Shajan (S8AU), Secretary Mr. Akhil Pauly (S8AU), and Treasurer Mr. Ashwin S Kumar (S6AU), alongside executive members Mr. Mohammed Zaeem and Mr. M K Vijay Sekhar. The overall event was meticulously guided by Faculty Coordinator Mr. Aravind P.V. and Student Coordinator Mr. Amal Shajan.

Masterclass in Adventure and Discipline

The highlight of the day was the powerful Inaugural Address by Chief Guest Mr. Shivayogi Parthasarathy—a renowned off-road driver, racing champion, and rescue worker famous for completing 42 road trips to the Himalayas.



Mr. Parthasarathy captivated the audience by sharing his extensive real-world experiences navigating difficult terrains and extreme weather conditions. He recounted gripping details of a critical rescue operation he conducted in the Himalayas, using the story to underscore the technical, physical, and mental preparedness required in extreme off-roading. Beyond the thrill of adventure, he emphasized the strict discipline, continuous learning, and rigorous safety training necessary for those aspiring to pursue professional off-road motorsports as a legitimate career.

Impact and Key Takeaways

The session effectively translated theoretical automotive passion into practical safety consciousness. By the end of the workshop, participating students gained critical awareness regarding the severe risks associated with reckless street racing versus the professional environment of legitimate motorsports. They were thoroughly briefed on the importance of adhering to traffic regulations and road safety rules.

The successful inauguration concluded with a Vote of Thanks by Mr. Vipinraj P.G., Head of the Automobile Engineering Department. Ultimately, the launch of Tech Torque and Fusion Torque delivered an inspiring, highly informative experience that motivated SSET students to pursue their engineering and extracurricular interests with a steadfast commitment to safety, responsibility, and determination.

Gear Up for 2026: Top 5 Automotive Trends Redefining India's Roads

The Indian automotive industry is shifting gears, and 2026 is shaping up to be a landmark year. The focus is rapidly moving from just fulfilling transportation needs to creating vehicles that are tech-driven, feature-loaded, and fundamentally safer. The upcoming year promises a convergence of futuristic technology with practical mobility solutions, bringing science fiction concepts closer to everyday reality for Indian drivers. The evolution of the market indicates a strong consumer preference for advanced features, seamlessly integrated connectivity, and sustainable alternatives.

Here are the top five automotive trends that will redefine the Indian auto industry in 2026:

1. ADAS Goes Mainstream

Safety is no longer a luxury reserved for premium buyers, marking a significant shift in consumer priorities and manufacturer offerings. Advanced Driver Assistance Systems (ADAS)—featuring adaptive cruise control, emergency brake assist, and even self-parking—are trickling down to mass-market models like the Hyundai Creta, Hyundai Venue, Kia Sonet, and Honda Amaze. This democratization of safety technology means that everyday commuters now have access to features that actively prevent accidents and reduce driver fatigue. With Bharat NCAP pushing stricter safety norms, Indian highways are bound to become safer, and the groundwork is being laid for the eventual introduction of fully self-driving cars in the country.

2. The EV Tipping Point

2026 is poised to be a major tipping point for Electric Vehicle (EV) adoption, transitioning EVs from a niche segment to a mainstream choice. Thanks to falling battery costs, better government incentives, and a rapidly expanding charging infrastructure, the barriers to EV ownership are crumbling. A huge catalyst is Maruti Suzuki's entry into the space with the E-Vitara, backed by an expanding network of over 2,000 charging points. This commitment from the country's largest carmaker signals a massive shift in the market dynamics. Furthermore, with charging times dropping and vehicle ranges exceeding 500 kilometers, range anxiety is becoming a thing of the past, paving the way for widespread EV adoption.



3. Cars as Tech Lounges

Vehicles are transforming into moving tech lounges, fundamentally altering the in-cabin experience. The "triple screen layout" is becoming the next big interior trend, featuring dedicated screens for the driver, central infotainment, and, importantly, the passenger. Models like the Tata Harrier EV and Mahindra XUV9e are leading this charge, turning the car into an extension of the digital lifestyle. Tech giants like MediaTek and Snapdragon are powering these connected experiences, ensuring smooth and responsive interfaces. The integration of high-end Samsung QLED displays emphasizes that visual tech and rear-seat entertainment are now primary concerns for buyers, making long drives significantly more enjoyable.

4. Smart Helmets for Two-Wheelers

In the world's largest bike market, rider safety and convenience are finally converging through wearable technology. Smart helmets equipped with Bluetooth connectivity, navigation alerts, and crash alerts are expected to become mainstream accessories rather than novelty items. These advanced helmets will seamlessly sync with motorcycles and smartphones to handle music, phone calls, and voice commands. This hands-free integration not only enhances convenience but also ensures a massive win for rider safety by minimizing distractions and keeping the rider's focus on the road.



5. The Hydrogen Horizon

While EVs currently dominate the alternative fuel headlines, hydrogen fuel cell technology is silently gaining global traction with major brands like Toyota and Hyundai investing heavily in its development. India is also actively gearing up to explore this space, recognizing its potential for specific use cases. Offering easy refueling, zero tailpipe emissions, and long operating ranges, hydrogen fuel cell vehicles are perfectly suited for commercial applications, heavy-duty vehicles, and large fleets where battery weight and charging times are limiting factors. The year 2026 could very well mark the crucial beginning of India's hydrogen journey, adding another vital piece to the sustainable mobility puzzle.

Conclusion India's 2026 garage is shaping up to be smarter, safer, and more connected than ever before. The future of Indian roads looks electric, deeply integrated with advanced technology, and seriously exciting, promising a transformation in how the nation commutes and travels.

Mr. Pranav Jomon Mani

2022-26 Batch AU

THE MIDNIGHT MECHANIC

Rajesh wiped the grease from his forehead with the back of his calloused hand. The clock on the garage wall ticked past 2:00 AM, the rhythmic sound almost drowned out by the heavy monsoon rain battering the tin roof. Outside, the roads of Kizhakkummuri were pitch black, slick with mud and water. Inside, illuminated by a single flickering halogen bulb, sat the heart of Rajesh's obsession: a 1984 Royal Enfield Bullet.

It wasn't just any motorcycle. It was his grandfather's, a machine that had traversed the length of Kerala for decades before being left to rust in a damp shed. For the past six months, after finishing his college classes, Rajesh would lock himself in this garage, applying every ounce of knowledge he'd gleaned from his manufacturing and thermodynamics lectures.

The cast-iron engine block lay disassembled on his workbench. He ran his fingers over the cylinder sleeve. The wear was uneven, a testament to decades of hard riding. He knew the tolerances needed to be precise. "Clearance volume," he muttered to himself, recalling the textbook definitions of the Otto cycle. But books couldn't teach the intuition required to feel when a piston ring sat perfectly flush against the bore.

He had spent the evening meticulously re-seating the valves. It was tedious work, requiring a steady hand and a fine lapping compound. A fraction of a millimeter off, and compression would be lost, leaving the engine gasping for power. As he torqued the head bolts down in a star pattern, a sense of anticipation began to build in his chest.

This wasn't just about restoring a machine. It was about proving a point. In an era where his peers were obsessed with lithium-ion cells, printed circuit boards, and electric motors, Rajesh found solace in the mechanical purity of a carburetor and a points ignition system. There was an honesty to it. If something was broken, you could see it. You could fix it with a wrench, not a laptop.

He connected the fuel line, watching the amber liquid flow from the teardrop tank into the float bowl of the Amal carburetor. He checked the spark plug, ensuring the gap was exactly 0.025 inches. Everything was ready.

"There was an honesty to it. If something was broken, you could see it. You could fix it with a wrench, not a laptop."



Rajesh swung a leg over the heavy saddle. The bike felt solid beneath him, a stark contrast to the lightweight plastic scooters prevalent on campus. He turned the ignition key. The small ammeter needle twitched. He pulled the decompressor lever, gently kicking the engine over until he felt the piston rise past top dead center.

He took a deep breath, the smell of damp earth and unburnt hydrocarbons filling his lungs. With one swift, heavy kick, he brought his boot down on the lever.

The engine coughed, sputtered, and died.

Rajesh cursed softly. He adjusted the idle screw slightly, richening the mixture. He repeated the ritual. Find top dead center. Breathe. Kick.

This time, the heavy cast-iron flywheels carried the momentum. The engine caught with a deafening roar that rattled the corrugated tin roof. *Thump-thump-thump*. It was a slow, deliberate heartbeat, echoing through the humid night air. The exhaust pumped out a thick cloud of blue smoke that quickly dissipated into the rain.

Rajesh smiled, a wide, genuine grin that cut through the exhaustion. He blipped the throttle, listening to the crisp response. The old beast was alive again. As he sat there, feeling the vibrations travel through the frame into his bones, he realized that true engineering wasn't just about the future. It was about respecting the past, understanding the fundamental forces of thermodynamics and motion, and having the sheer stubbornness to make cold metal breathe fire once more.

Mr. Adithyan N K

2023-27 Batch AU



Ode to the Combustion Engine

A spark ignites in chambers dark,
A tiny, fierce, controlled remark.
The piston falls, the crank revolves,
As fuel to motion soon resolves.

Through intake valves the air is drawn,
A breath before the violent dawn.
Compression builds, the pressure tight,
Before the flash of sudden light.

Oh, cast iron heart that beats so loud,
That moves the earth and parts the crowd.
Though quiet wires may take your place,
We won't forget your roaring grace.

Mr. Ananthapadmanabhan K. S.
2025-29 Batch AU



RIDING THE WESTERN GHATS: KERALA TO COORG

The idea was born in the college canteen, fueled by strong tea and an impending long weekend. Three mechanical engineering students, two KTM Dukes, and one heavily modified Himalayan. Our objective? To trace the spine of the Western Ghats from our campus in Palissery, up through the hairpin bends of Wayanad, and into the misty coffee plantations of Coorg.

We departed at 4:30 AM. The air was crisp, carrying the scent of damp earth and wet asphalt from a brief overnight shower. As we hit the open highway heading north towards Kozhikode, the synchronized hum of the engines was our only soundtrack. It's on stretches like these that you truly appreciate the mechanical harmony of a well-tuned engine—the perfect stoichiometric mix, the precise spark timing, delivering power to the rear wheel.

The real challenge, however, began as we approached the Thamarassery Churam. Nine hairpin bends, steep gradients, and unpredictable traffic. Here, it wasn't about top speed; it was about low-end torque and clutch control. The Himalayan, with its long-stroke engine, tractored up the inclines with ease, while the high-revving Dukes required constant gear shifts to stay in the powerband. It was a practical masterclass in engine dynamics that no textbook could fully convey.



By the time we crested the Churam and entered Wayanad, the landscape had transformed. The urban clutter gave way to sprawling tea estates painted in impossible shades of green. We stopped by a roadside stall for a quick breakfast of Puttu and Kadala curry. The bikes sat ticking beside us, exhaust pipes cooling rapidly in the mountain air.

"There was an honesty to it. If something was broken, you could see it. You could fix it with a wrench, not a laptop."

Crossing the border into Karnataka, the roads narrowed, overshadowed by towering bamboo canopies. The tarmac here was a patchwork of recent repairs and deep potholes. This is where suspension geometry and damping characteristics were put to the test. The telescopic forks worked overtime, absorbing the shocks and keeping the rubber planted on the erratic surface.

As evening approached, we finally rolled into Madikeri, the heart of Coorg. The temperature had dropped significantly, and a thick fog was rolling in, drastically reducing visibility. Our headlights cut weak yellow cones through the mist as we navigated the final miles to our homestay.

That night, sitting around a small campfire, we didn't talk about thermodynamics or manufacturing processes. We talked about the corners we took perfectly, the close calls with oncoming buses, and the sheer, unadulterated joy of covering distance on two wheels.

A road trip isn't just a journey through physical space; it's a recalibration of the mind. As engineers, we spend so much time studying how machines work, we sometimes forget to just ride them. The Western Ghats reminded us of why we chose this field in the first place.

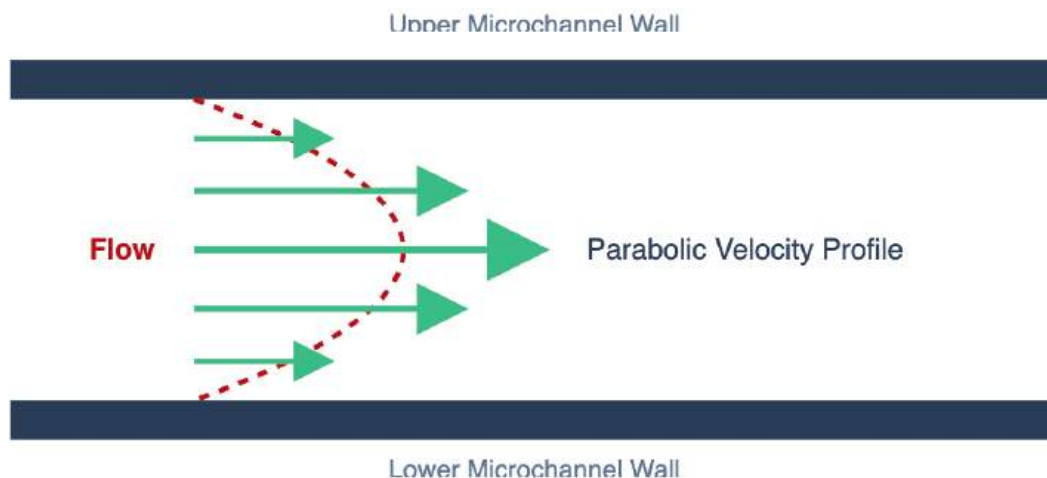
Mr. Abhinand K
2023-27 Batch AU

Mastering the Microscale: Low Reynolds Number Flow

As the automotive industry pushes the boundaries of electric vehicle (EV) performance, managing the intense heat generated by high-density battery packs and power electronics has become a paramount engineering challenge. Traditional liquid cooling plates are rapidly evolving into sophisticated microchannel heat exchangers. To understand these advanced cooling systems, mechanical engineers must delve into the unique fluid dynamics of the microscale, specifically focusing on Low Reynolds Number flow.

The Physics of the Microscale

In classical fluid mechanics, the Reynolds number (Re) is a dimensionless quantity used to predict fluid flow patterns. It represents the ratio of inertial forces to viscous forces within a fluid subjected to relative internal movement. The formula is expressed as $Re = (\rho v L) / \mu$, where ρ is fluid density, v is fluid velocity, L is the characteristic length (the hydraulic diameter of the channel), and μ is the dynamic viscosity.



In microchannels, the characteristic length (L) is exceptionally small—typically ranging from just 10 to 500 micrometers. Consequently, the Reynolds number drops drastically, often falling well below 100, and sometimes approaching zero (a state known as creeping flow or Stokes flow). At this microscopic scale, viscous forces overwhelmingly dominate inertial forces. The flow is strictly laminar, meaning the fluid moves in smooth, parallel layers with absolutely no lateral mixing, turbulence, or eddies.

Implications for Thermal Management

Because low Reynolds number flows do not experience turbulent mixing, heat transfer between the fluid and the channel walls occurs purely through thermal conduction across the fluid layers. While this might initially seem less efficient than turbulent convection, microchannels compensate with a massive surface-area-to-volume ratio.

When applied to EV battery cooling plates, this high surface area allows for exceptional heat dissipation rates. A well-designed microchannel cold plate can remove immense heat fluxes, keeping high-voltage Li-ion or solid-state cells within their narrow optimal operating temperature range (typically 20°C to 40°C). This precision cooling is vital for preventing thermal runaway and extending battery lifespan.

Manufacturing Microchannels

Producing these microscopic channels requires manufacturing techniques that push the absolute limits of conventional mechanical engineering. Traditional forming methods like sand casting and rolling are entirely insufficient for micro-scale geometries.

Instead, automotive manufacturers rely on advanced precision machining and non-traditional methods. High-precision 5-axis CNC machining using micro-end mills can cut channels into solid copper or aluminum blocks. However, the future of thermal management lies heavily in Additive Manufacturing (3D Printing). Technologies like Direct Metal Laser Sintering (DMLS) allow engineers to print complex, three-dimensional micro-vascular networks that conform perfectly to the irregular shapes of battery modules, optimizing cooling pathways in ways that subtractive manufacturing simply cannot achieve.

As the line between mechanical engineering and fluid micro-physics continues to blur, understanding the behavior of fluids at the microscale will be essential for the next generation of engineers stepping into the green mobility sector

Mr. Nived. A. Babu
2023-27 Batch AU

Igniting Entrepreneurial Drive: Workshop on Converting Engineering Challenges into Opportunities

The Department of Automobile Engineering and the Centre for Indian Knowledge Systems, in association with the Internal Quality Assurance Cell (IQAC) and the Innovation and Entrepreneurship Development Centre (IEDC) of SCMS School of Engineering & Technology (SSET), organized an intensive, day-long workshop titled "Where Passion Converts Engineering Challenges into Opportunities" on December 4, 2025. Conducted from 10:00 AM to 3:00 PM at the Seminar Hall in AC Block-1, the event brought together aspiring student engineers, faculty members, and young innovators to explore how technical roadblocks can serve as springboards for entrepreneurial success.



Objectives and Context

Engineering education equips students with design fundamentals, analytical rigor, and prototyping tools, yet translating technical problem-solving into viable commercial enterprises remains a steep challenge. Jointly hosted with SSET IEDC and the Centre for Indian Knowledge Systems, this workshop was designed to:

- Bridge the divide between classroom engineering theories and ground-level industrial realities.
- Instill an entrepreneurial mindset that views design failures, supply constraints, and technical bottlenecks as strategic market opportunities.
- Draw upon traditional principles of resilience and indigenous industrial acumen to foster sustainable innovation in automotive and mechanical design.

Industry Insights by Mr. M. R. Mohandas

The session was headlined by Mr. M. R. Mohandas, Managing Director of Presune Motors Company, Piravom, Ernakulam. Drawing from decades of industrial leadership and vehicle manufacturing experience, Mr. Mohandas delivered an engaging, narrative-driven masterclass rooted in firsthand industrial execution.

Key highlights of his address included:

- The Reality of the Shop Floor: Demystifying the gap between idealized CAD models and the messy friction of physical fabrication, assembly lines, and mechanical tolerances.
- Reframing Failure: Sharing real-world case studies from Presune Motors where critical component breakdowns and engineering setbacks ultimately led to patented innovations and leaner manufacturing workflows.
- Bootstrapping and Market Viability: Guiding students on how to validate mechanical designs against actual consumer needs, manage early-stage capital, and scale automotive prototypes into commercially sustainable operations.
- Passion as Engineering Fuel: Emphasizing that while technical calculations provide the framework, relentless passion and resilience are the true determinants of whether an engineering venture survives commercial headwinds.

Interactive Sessions and Student Takeaways

The workshop's afternoon segment shifted into an interactive forum where student innovators—including collegiate design and fabrication teams—presented conceptual hurdles they faced in vehicle builds, part sourcing, and powertrain integration. Mr. Mohandas reviewed student inquiries directly, offering practical troubleshooting strategies, component localization tips, and advice on pitching technical innovations to potential industrial backers.

Coordinated through the collaborative efforts of the Automobile Engineering Department, IQAC, IEDC, and the Centre for Indian Knowledge Systems, the five-hour program energized the campus innovation ecosystem. By showcasing the journey of a homegrown automotive leader, the initiative reinforced SSET's commitment to producing graduates who are not merely job seekers, but forward-thinking engineers equipped to create sustainable industrial solutions.

THE LAST GEARBOX

The year was 2045, and the city hummed with a uniform, high-pitched whine. It was the sound of magnetic levitation and brushless electric motors. Vehicles moved in perfect, autonomous synchronization, governed by a central grid that eliminated traffic jams and collisions. It was efficient. It was safe. It was entirely soul-less.

Old man Thomas ran a small, illicit workshop on the outskirts of the sprawling metropolis. His shop didn't deal in firmware updates or battery cell recalibrations. It dealt in grease, steel, and a forbidden concept: manual control.

Hidden beneath a tarp in the corner of his shop was a relic from the early 21st century—a sports car with an internal combustion engine and, crucially, a six-speed manual transmission. To possess such a vehicle wasn't exactly illegal, but operating it on the automated public grid was a severe offense.

One evening, a young woman named Krishnapriya slipped into his shop. She was an engineer for the city's autonomous transit authority, brilliant but undeniably bored. "I heard you have something... analog," she said, eyeing the tarp.

Thomas pulled the cover back. The polished red paint caught the dim light. Krishnapriya approached it reverently. She understood the theory, of course. She knew the gear ratios, the function of the synchronizer rings, the engagement of the clutch plates. But she had never physically interacted with one.

"Show me," she requested.



They drove out to an abandoned airstrip far beyond the city limits. Thomas put her in the driver's seat. He explained the delicate dance required between the left foot on the clutch and the right hand on the shifter.

Her first attempt resulted in a violent shudder and a stalled engine. She was used to instantaneous, binary responses. The car demanded analog nuance. Thomas was patient. "Feel the bite point," he instructed. "Don't just think about the mechanics; listen to the engine. It will tell you what it needs."

On her fourth try, she found the balance. The clutch engaged smoothly, and the car rolled forward. As the RPM climbed, she lifted off the throttle, depressed the clutch, and firmly pulled the lever into second gear. A satisfying mechanical *clunk* resonated through the cabin.

Krishnapriya gasped. The sensation was entirely foreign. It wasn't a computer algorithm making a decision; it was a physical, mechanical connection forged by her own coordination. She felt the vibration of the drivetrain in her hands and feet. For the first time in her life, she wasn't just a passenger dictating a destination; she was a driver.

She shifted into third, the wind roaring through the open windows. The roar of the engine was chaotic, inefficient, and glorious. In that fleeting moment on the crumbling asphalt, she realized what her generation of engineers had optimized away. They had achieved perfect mobility, but they had engineered out the joy of the machine.

When they finally stopped, the silence of the night settled back in. Krishnapriya ran a hand over the steering wheel. "I understand now," she whispered to Thomas. "I understand why you kept it."

Ms. Krishnapriya R.
2023-27 Batch AU



THE SPITI VALLEY EXPEDITION

It is one thing to study the effects of low atmospheric pressure on engine combustion in a classroom. It is an entirely different beast to experience it while clinging to a cliff face at 14,000 feet.

The Spiti Valley, a cold desert mountain valley located high in the Himalayas, is the ultimate proving ground for both man and machine.

Our expedition consisted of five riders, all final-year students, riding a mix of rented Royal Enfields and one very brave Hero Xpulse. We started from Shimla, the air heavy and warm, our carburetor jets tuned for standard sea-level operation. The plan was ambitious: complete the Spiti loop via Kinnaur, cross the formidable Kunzum Pass, and descend into Manali.

The roads, if you could call them that, were unforgiving. From treacherous water crossings fed by melting glaciers to stretches of pure, loose gravel, every kilometer demanded absolute concentration. As we ascended past Nako and into the barren, moon-like landscape of Spiti, the drop in oxygen became palpable. The bikes began to struggle, running rich, lacking power, and gasping for air just as much as we were.

We had to make makeshift adjustments on the side of the road, leaning out the air-fuel mixture to keep the engines from fouling spark plugs. It was a practical exam in thermodynamics, conducted with freezing hands and limited tools.

Reaching the Key Monastery, perched precariously on a hill overlooking the Spiti River, made the mechanical struggles worthwhile. The stark beauty of the valley, with its jagged peaks and endless blue sky, was overwhelming. But the hardest part was yet to come: the Kunzum Pass.



At 15,000 feet, the temperature plummeted. We encountered light snowfall, making the rocky ascent incredibly slippery. The cold thickened the engine oil, making starting the bikes each morning a laborious process of kick-starting and coaxing life into the cold metal.

During a particularly tough water crossing, the Xpulse stalled mid-stream. We had to wade into the freezing water to push it out. Drying the spark plug and clearing the water from the airbox took an hour, but the collective cheer when the engine finally fired up echoed off the canyon walls.

Descending into Manali via the newly opened tunnel was surreal. The transition from the harsh, rocky desert to lush pine forests felt like passing through a portal. We were exhausted, our bikes were battered, chains loose, and suspensions weeping oil.

The Spiti expedition wasn't just a ride; it was a testament to endurance. It taught us that engineering on paper is perfect, but real-world conditions introduce chaos. A good engineer designs for ideal conditions; a great engineer designs for the chaos of the Himalayas.

Expedition Stats	
Total Distance	850 km
Highest Altitude	15,060 ft (Kunzum Pass)
Breakdowns	3 (Clutch cable, Spark plug foul, Puncture)
Memories Made	Countless

Mr. Mohamed Sajas P. S.
2022-26 Batch AU

Empowering Technical Educators: Workshop on the Effective Use of AI Tools

The Department of Automobile Engineering, in association with the Internal Quality Assurance Cell (IQAC) of SCMS School of Engineering & Technology (SSET), organized a specialized skill-enhancement workshop titled "Effective use of AI Tools" on Friday, December 19, 2025. Hosted at the CAD Lab in Academic Block-1 from 1:00 PM to 2:00 PM, the session was specifically tailored for laboratory staff across the Automobile Engineering (AU) and Mechanical Engineering (ME) departments.

Objectives and Context

As engineering education rapidly integrates smart technologies and automated workflows, laboratory environments require parallel evolution. The workshop was conceived to equip technical and laboratory instructors with practical competencies in modern artificial intelligence platforms, focusing on:

- Streamlining lab record maintenance and automated inventory logging.
- Implementing AI assistance for troubleshooting diagnostic equipment and CAD software workflows.
- Enhancing lab documentation, safety checklists, and instructional materials for undergraduate engineering students.

Expert Insights by Dr. S. R. Akhil Krishnan

The session was led by Dr. S. R. Akhil Krishnan, Assistant Professor in the Department of Automobile Engineering. Bringing both academic expertise and hands-on familiarity with digital lab tools, Dr. Akhil Krishnan guided the participants through live demonstrations and interactive use cases.



Key highlights of the address included:

- Demystifying AI for Technical Staff: Shifting the perspective from viewing AI as a replacement tool to utilizing it as an efficiency multiplier in day-to-day laboratory administration.
- Prompt Engineering for Technical Documentation: Hands-on exercises showing how generative tools can rapidly draft equipment calibration steps, experiment templates, and troubleshooting matrices.
- Integration with CAD and Manufacturing Environments: Demonstrating how generative AI platforms and analytical tools support modern CAD workflows and mechanical fabrication labs.

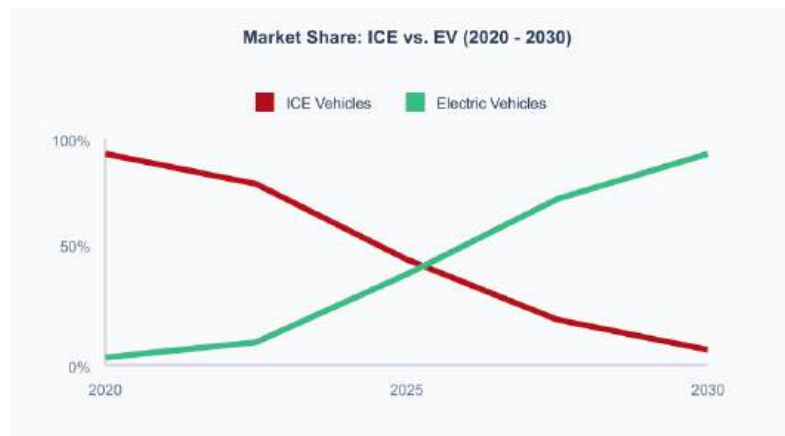
Impact and Key Takeaways

The one-hour interactive session in the CAD Lab provided an open platform for lab superintendents and technical staff to experiment with AI interfaces. Participants engaged in practical exercises that demonstrated how automated prompts could reduce repetitive administrative burdens, allowing staff to devote more time to high-value student mentoring and lab maintenance.

The initiative represents another step by SCMS School of Engineering & Technology to foster institutional quality and digital literacy across all tiers of academic operations. Coordinated through the IQAC framework, the program reinforced the institution's commitment to continuous professional development and technological readiness.

Comprehensive Industry Analysis: The Rise of Green Mobility and the EV Tipping Point

The automotive industry is undergoing a structural paradigm shift, transitioning rapidly from over a century of reliance on internal combustion to a future dominated by electric propulsion. As illustrated in the market share projections for 2020 to 2030, this transition is no longer a gradual curve but an aggressive market reshaping. This expanded analysis breaks down the market dynamics of this "EV Tipping Point" and evaluates how foundational mechanical engineering principles must adapt to serve the next generation of green mobility.



1. The EV Tipping Point (2024–2026)

The intersection point on the market share chart, occurring roughly between 2024 and 2026, represents a critical threshold where the adoption rate of Electric Vehicles (EVs) surpasses that of traditional Internal Combustion Engine (ICE) vehicles. This acceleration is driven by three primary factors:

- **Battery Cost Parity:** Massive reductions in lithium-ion and solid-state battery costs per kWh are bringing the initial purchase price of EVs down to match, and soon undercut, traditional ICE vehicles.
- **Infrastructure Scaling:** Heavy global investments in rapid-charging networks and grid modernizations are effectively mitigating consumer range anxiety.
- **Regulatory Pressures:** Government mandates for zero-emission vehicles and tightening emissions standards are forcing legacy automakers to pivot their R&D away from fossil fuels entirely.

2. Transitional Technologies: From ICE to Hybrids

While pure electric platforms represent the future, the immediate transition relies heavily on optimizing existing thermal and mechanical technologies. The fundamental principles of thermodynamic cycles—specifically the Otto and Diesel cycles—remain critical for understanding legacy systems.

- **Advanced Fuel Delivery:** To extract maximum efficiency from diminishing ICE market share, manufacturers rely on highly refined systems such as Common Rail Direct Injection (CRDI) and Multi-Point Fuel Injection (MPFI).
- **Hybrid Engines:** As a bridge across the "EV Tipping Point," hybrid engines combine the traditional working mechanics of 4-stroke spark-ignition (SI) or compression-ignition (CI) engines with auxiliary electric motors. This hybridization requires engineers to seamlessly integrate mechanical power delivery with high-voltage electrical architecture.

3. The Evolution of Core Mechanical Components

The rise of green mobility does not render mechanical engineering obsolete; rather, it shifts the focus. While traditional engine blocks may disappear, the fundamental mechanics of power transmission and fluid dynamics remain deeply relevant to EV design.

- **Power Transmission:** The massive, instantaneous torque generated by electric motors requires highly durable transmission components. The design and application of different types of gears, including spur, helical, bevel, and worm gears, remain essential for EV reduction gearboxes. Furthermore, high-performance bearings, such as journal and ball bearings, are critical to managing the high rotational speeds of electric motors.
- **Thermal Management and Fluid Dynamics:** While EVs lack exhaust systems, they require complex thermal management for battery packs and power electronics. The principles of refrigeration, including vapor compression cycles, are adapted to cool high-voltage batteries to optimal operating temperatures. Additionally, the circulation of these coolants relies heavily on mechanical pumps, utilizing the working principles of centrifugal and reciprocating pumps to maintain fluid flow.

4. Advanced Manufacturing for the EV Era

To maximize the range and efficiency of electric vehicles, automakers are hyper-focused on lightweighting and precision manufacturing. The structural and mechanical components of EVs rely on the evolution of traditional manufacturing processes adapted by modern mechanical engineers.

- **Forming and Shaping:** Foundational processes such as sand casting, forging, rolling, and extrusion are being pushed to their limits to create lightweight aluminum subframes and battery enclosures.
- **Metal Joining:** The assembly of complex EV chassis and battery cages requires reliable metal joining processes, including advanced Arc Welding, SMAW, soldering, and brazing.
- **Precision Machining:** The tight tolerances required for EV motor housings and aerodynamic components demand advanced machining operations. While traditional lathe and milling machines play a role, the industry leans heavily on automated CNC machines and 3D printing for rapid prototyping and complex geometric manufacturing.

5. Future Outlook: The Interdisciplinary Engineer

As the market share of electric vehicles pushes toward the 100% mark by 2030, the automotive industry will demand a new breed of engineering professional. The purely mechanical engineer of the past is being replaced by the mechatronics expert. Understanding the relevance of various mechanical disciplines—from thermodynamics to precision manufacturing—provides the necessary physical scaffolding upon which new software and electrical systems are built. For incoming engineers, maintaining a solid foundation in traditional mechanical design while aggressively pursuing electrical and software integration is the only path to remaining relevant in this rapidly intersecting era.

Dr. Manoj Kumar B.

Associate Professor
Department of Automobile Engineering

Rejuvenate: Faculty Development Workshop Explores Wellness and Mindfulness

The Department of Automobile Engineering, in association with the Internal Quality Assurance Cell (IQAC) of SCMS School of Engineering & Technology (SSET), organized a faculty enrichment workshop titled "Rejuvenate: Art of Living for Faculty Members" on November 21, 2025. Held at the Seminar Hall in the AD Block beginning at 9:00 AM, the program focused on holistic well-being, stress mitigation, and work-life balance for academic professionals.



Purpose and Context

Teaching and research in higher engineering education demand persistent cognitive focus, administrative responsibility, and emotional resilience. Recognizing the vital role of mental and physical wellness in sustaining instructional quality, the workshop was curated to offer educators effective relaxation strategies, breathwork techniques, and practical mindfulness tools to manage occupational stress.

Session Leadership by Mr. Baboo P. R.

The workshop was conducted by Mr. Baboo P. R., a distinguished multifaceted expert serving as an Industrialist, Engineer, Yoga & Meditation Trainer, and faculty member of The Art of Living foundation.

Bringing an engineering background coupled with extensive training in holistic sciences, Mr. Baboo bridged analytical thinking with mindfulness practices:

- **Mind-Body Mechanics:** Explaining the neurobiology of stress and illustrating how simple breathing and postural routines counteract physical tension.
- **Guided Breathwork and Pranayama:** Leading participants through experiential breathing exercises designed to enhance focus, mental clarity, and day-to-day stamina.
- **Mindfulness for Educators:** Sharing pragmatic techniques to sustain composure in high-pressure classroom environments and cultivate an empathetic student-teacher rapport.
- **Work-Life Integration:** Offering strategies to harmonize demanding institutional schedules with personal self-care and rejuvenation.

PLACEMENTS 2025-26

Congratulations on your Placement at



AU



Adithyan J. Biju
2022-26 Batch

AU



Deepak B.
2022-26 Batch

AU



Pranav Jomon Mani
2022-26 Batch

Congratulations

Department of Automobile Engineering
S6 B.Tech University Exam Toppers of SSET (Batch 2023-27)



Nived A. Babu
SGPA: 8.78



Aravind A.
SGPA: 8

Congratulations

Department of Automobile Engineering
S2 B.Tech University Exam Toppers of SSET (Batch 2025-29)



Ananda Padmanabhan
SGPA: 8.15



Sreehari Reman
SGPA: 8.5



Akshat Mahesh
SGPA: 8.07

Congratulations

Department of Automobile Engineering
S8 B.Tech University Exam Toppers of SSET (Batch 2022-26)



Pranav Jomon
SGPA: 9.09



Deepak B.
SGPA: 8.59

SAEIndia Collegiate Club Of SCMS - Steering The Revolution In Automobile Engineering

At the heart of SCMS lies the SAEINDIA Collegiate Club, a beacon of innovation and excellence in the automotive world. Established with a vision, our club is not just about imparting knowledge; it's about igniting passion. We're here to shape the next generation of automotive engineers, offering them a platform where ideas accelerate into reality.

Through immersive hands-on workshops, exhilarating competitive events, and invaluable industry collaborations, we ensure our students are always a gear ahead. For those with a drive to redefine the automotive landscape, our club is the pitstop where your journey begins. Dive in, and let's drive the future, together.



Torque - The Driving Force of Automobile Engineering at SSET

TORQUE is the dedicated Automobile Engineering Students' Association at SCMS School of Engineering & Technology (SSET) in Karukutty, serving as a dynamic platform for emerging engineers to explore automotive innovation and envision the future of mobility. Moving beyond traditional mechanics, TORQUE fosters a holistic community of learners by introducing a wide spectrum of disciplines and encouraging hands-on, collaborative projects with industry experts. On January 7, 2026, the association significantly expanded its scope by inaugurating two specialized sub-clubs: "Tech Torque" as the domain club focusing on technical skill development, and "Fusion Torque" as the cultural club dedicated to creativity and holistic personality development. Through these initiatives, TORQUE ensures that ambitious students are not just studying engineering, but actively living it.



AUTO TRIVIA & WORD GRID

Test Your Knowledge

1. In the Carnot Cycle, how many isothermal and adiabatic processes are there?
2. What does MPFI stand for in the context of IC engines?
3. Which building code dictates the standard floor area ratio in Kerala?
4. Name the metal joining process that utilizes a non-ferrous filler metal with a melting point above 450°C but below that of the base metal.
5. What sensor is primarily responsible for 3D mapping in autonomous vehicles?

Engineering Word Find?

T	H	E	R	M	O	T	A
S	T	R	O	K	E	A	D
A	A	B	R	A	Z	E	A
C	L	U	T	C	H	X	S
R	O	L	L	I	N	G	M
A	T	C	Y	C	L	E	A
P	I	S	T	O	N	R	W



Wheels of Innovation

DEPARTMENT OF AUTOMOBILE ENGINEERING



Vision of SSET

- To be a premier institution moulding ethical and socially responsible engineers with emphasis on 'Service Learning'.
- To be among the top ten institutions in India by 2040, shaping technology innovators and leaders for spearheading research relating to sustainable development goals.

Mission of SSET

- Innovative education and research for shaping technoleaders



SCMS SCHOOL OF ENGINEERING
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