MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
(An Autonomous Institution)

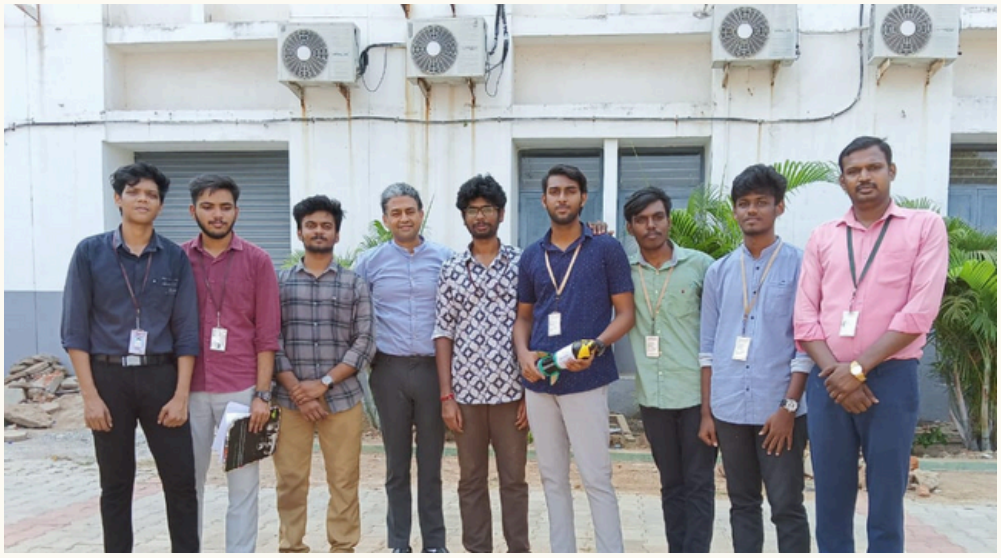
PRODUCT DEVELOPMENT CLUB

MechXpress

-february 14, 2025

A Heartfelt Thank You

We extend our sincere gratitude to our beloved Secretary Mr. N.Sreekanth Sir and respected principal Mr. S.V Saravanan Sir and Head of the Mechanical department Dr. S. Kamatchi Sankaran Sir for their unwavering support and encouragement in fostering extracurricular activities at our college. Their dedication to student growth beyond academics has provided us with countless opportunities to explore our talents, develop leadership skills, and create memorable experiences.



WE SPECIALLY THANK THE FIRST AND THE BEST OFFICE BEARERS OF PRODUCT DEVELOPMENT CLUB, WHO WORKED HARD AND SMART FOR THE CLUB AND MADE THEMSELVES AS A INSPIRATIONAL PEOPLE FOR THE FUTURE CLUB MEMBERS.

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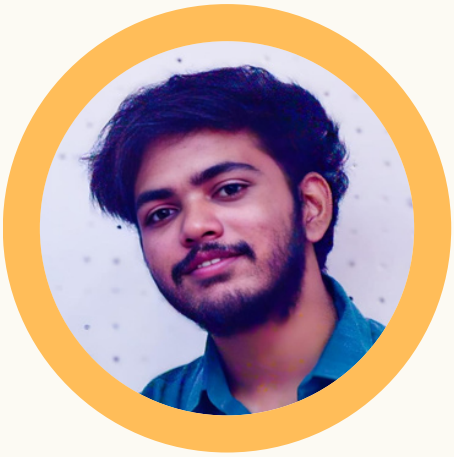


MOHAMMED YASDAN N.A

SECRETARY

Steering Lead - Torque-X

SARVESH V.K

TREASURER

Suspension Lead - Torque-X

The Impact of Mechanical Engineering on Emerging Technologies

-- AN ARTICLE FROM CASE WESTERN RESERVE UNIVERSITY

The latest advancements in generative artificial intelligence (AI) and machine learning have given rise to speculations about how they will transform the future. Although there's no doubt that AI is reshaping much of our world, there are equally transformative developments occurring in the field of mechanical engineering, many in conjunction with emerging and new technologies. The mechanical engineering industry has long been at the forefront of technological progress and it continues to have a far-reaching impact.

Designing With Advanced Materials

Advanced materials such as high-strength alloys, composite materials and smart materials have pushed the boundaries of what's possible in manufacturing. They have unique characteristics—improved strength, conductivity, flexibility or temperature resistance, for example—that give engineers the ability to develop new products that are more durable, efficient or lightweight than older products. Mechanical engineers have used advanced materials to create innovative machinery such as lighter, stronger aircraft and more crash-resistant cars.

Robotics, Automation and AI

Many of the advancements in automation and AI can only come to fruition through mechanical engineering. As a mechanical engineer, you are fundamental to the design and construction of robotics systems—involved in developing the structural framework; mobility solutions, such as wheels and joints; and actuation mechanisms, such as motors and hydraulics. The complex challenge often lies in creating robots that are both durable and flexible, capable of performing various tasks while operating in disparate environments.

In your mechanical engineering career, you may incorporate sensor technology into robotics and automated systems. Sensors allow robots to interact with their environment and humans, which is essential to their effectiveness and operational efficiency in performing tasks such as moving warehouse inventory or cleaning up toxic waste. Together, mechanical engineering, robotics, automation and AI can redelegate labor-intensive, repetitive tasks that are too hazardous for humans.

Renewable Energy and Sustainability

The mechanical engineering world is creating remarkable new developments in renewable energy and sustainability, as engineers design and improve elements such as hydroelectric dams, solar panels and wind turbines. These innovative solutions can help reduce environmental pollution by minimizing waste and harmful byproducts. The expansion of renewable energy infrastructure optimizes the reliability and efficiency of these systems, allowing them to be implemented in resource-poor areas where they're often needed the most.

Another area in which mechanical engineering is advancing sustainability is in green transportation models. Fuel-efficient vehicles and those that use alternative energy sources such as electric and

hybrid engines can make a significant impact by reducing greenhouse gas emissions in the transportation industry.

Aerospace and Space Exploration

Mechanical engineering plays a fundamental and multifaceted role in aerospace and space exploration, including the design, development, testing and improvement of aircraft, spacecraft and related systems. When designing spacecraft, mechanical engineers consider factors such as the vacuum of space, extreme temperature variations and the need to minimize weight while maximizing strength and functionality.

They draw on their technical expertise to design propulsion systems for space travel, including rockets and propulsion methods for interplanetary travel and habitable systems that control temperature, pressure and air composition, all of which are essential for crewed space missions.

Smart Devices and the Internet of Things

The Internet of Things (IoT)—a network of interrelated devices, typically embedded with technology such as sensors and software, that connect and exchange data with other IoT devices and the cloud7—is ushering in the Fourth Industrial Revolution. According to the global consulting firm McKinsey & Co., the Fourth Industrial Revolution involves the digitization of the manufacturing process, largely driven by the connectivity and data analytics made possible by smart devices.

Smart devices rely on firmware, a type of software that helps the hardware function, which is often devised by software engineers. However, firmware is implanted in structural frameworks, such as home security cameras and smart dishwashers, that are designed using mechanical engineering principles. Smart devices may need to withstand harsh conditions, including high temperatures and humidity and continuously operate without much outside intervention or support. Mechanical engineers design these rugged systems that provide the framework for connected devices that collect and transmit data.

Biomechanics and Medical Devices

Biomedical engineering combines mechanical engineering principles and a deep understanding of biological processes. Mechanical engineers apply fundamental engineering principles, such as fluid dynamics, material science and thermodynamics to their work for the healthcare industry, creating prostheses, implants and other medical devices.

The mechanical engineering industry is instrumental in developing and optimizing new drug-delivery systems for precise administration and advanced imaging technology such as MRIs and CT scans. Future developments in biomechanics and medical devices may include customized solutions, such as targeted medication delivery, real-time diagnostics and biocompatible materials.

Torque-X at SAE BAJA 2025: A Thrilling Ride!

-- SARAVANA PERUMAL.L
(CAPTAIN - TORQUE-X)

What a journey it has been for Team Torque-X at SAE BAJA 2025! From brainstorming in classrooms to racing towards the final event at NATRAX, Pithampur, our adventure was filled with innovation, teamwork, and sheer determination.

Kicking Off the Dream!

It all started in early 2024 when a group of passionate Final Year mechanical engineering students from Meenakshi Sundararajan Engineering College came together with a common goal – to design and build an ATV (All-Terrain Vehicle) capable of tackling the toughest terrains at BAJA!

Phases towards success!

The team Torque-X successfully crossed the phase-1 and phase-2 of the SAE Baja 2025 with being at All India Ranking within **Top 10** by their impressive presentation skills, design and simulation.

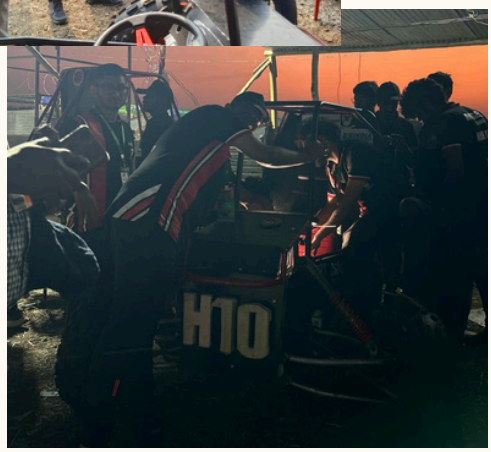
Torque-X at SAE BAJA 2025: A Thrilling Ride! 🚗💨

Building the Beast! 🔧

With a rock-solid roll cage, an optimized suspension system, and a powerful engine, our vehicle was taking shape! The entire team pulled off a 15-day assembly sprint (a process that usually takes three months!) – now that's dedication!

The Main Event – A Test of Grit! 🏁

After months of preparation, we made it to NATRAX for the big showdown. The event was intense – technical inspections, endurance runs, and last-minute fixes kept us on our toes. While we didn't clear the final endurance race, our innovation – an hCNG leak detection system – was recognized and even caught the attention of TATA Motors!



More Than a Competition! 🎯

BAJA wasn't just about building a car; it was a life-changing experience that tested our skills, patience, and resilience. We pushed boundaries, made unforgettable memories, and most importantly, laid the foundation for future Torque-X teams to build on.

OUR CLUB's JOURNEY

(events)

BOTTLE ROCKETRY🚀

FIRST EVENT OF PD CLUB

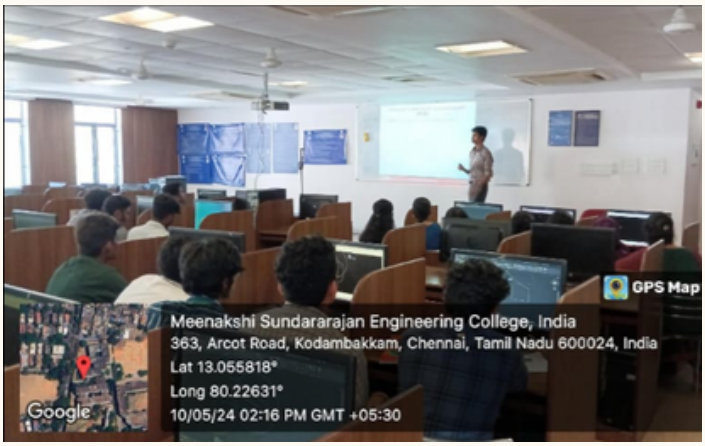
Gathering students to test their miniature rockets for a Sonic Boom

CONDUTCED ON : 13/03/2024

2D WORKSHOP

Designing the future of their view with the basics of CAD software

CONDUCTED ON: 10/05/24



CNC/VMC WORKSHOP🔩

Hands on workshop on the manufacturing part of the mechanical field.

CONDUCTED ON: 28/09/24

TORQUE QUEST🧠

Channelling the automobile interests of the students with 2 rounds of automobiles.

CONDUCTED ON : 13/09/2024

MECH FUSION🐦‍🔥

A 10 minutes of fun games with basic mechanical questions

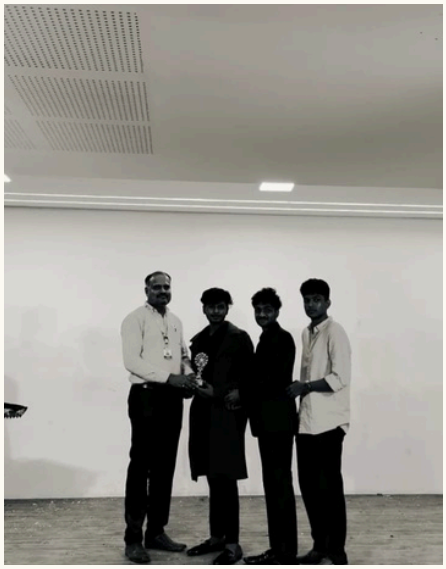
CONDUCTED ON : 28/10/24

MECH CHARADES📰

First years with their crazy games blended with mechanical knowledge.

CONDUCTED ON: 18/12/2024

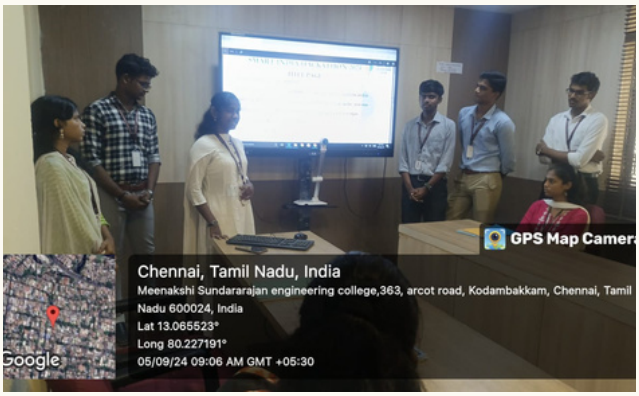
ACHIEVEMENTS



Sommer
First year Mech
3rd Prize in Ramp Walk
(SA Engineering College)

Aananthi.S
Third year mech
1st Prize in Tech War
(St Joseph's Engg College)

1st Year Students
receiving 1st prize
in Fireless Cooking
at Euphoria 2024



2nd Year Students with Biogas
innovation idea

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MSEC PRODUCT DEVELOPMENT CLUB

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STAY TUNED FOR NEXT MONTH!!

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THANK YOU