Tech Know Centre | 2025-26

യാത്രിക

STATUTORY WARNING

SMOKING AND ALCOHOL CONSUMPTION IS INJURIOUS TO HEALTH

THIAGARAJAR POLYTECHNIC COLLEGE

ALAGAPPANAGAR,THRISSUR

Tech know centre

ASSOCIATION OF MECHANICAL

ABOUT THE DEPARTMENT

The Department of Mechanical Engineering is one of the oldest departments at Thiagarajar Polytechnic College. It is dedicated to delivering high-quality education through a balanced approach of theoretical instruction and hands-on practical training by integrating core mechanical engineering principles with modern management tools and professional values. The department aims to produce dynamic professionals capable of contributing meaningfully to the industry and society.

VISION OF THE DEPARTMENT

To be a center of excellence in shaping skilled, self-driven, and socially responsible Mechanical Engineers.

MISSION OF THE DEPARTMENT

- To provide theoretical and practical hands-on education in mechanical engineering machines and tools
- To promote ethical practices, social values, teamwork, and lifelong learning among students.
- To participate in the development in accordance with societal demands through internship, innovation and industry interaction

Preamble

Tech Know Centre | 2025–26

Tech know centre

ASSOCIATION OF MECHANICAL

Justin pachen
Hod 2019 to 2023
Now serving as Chartered Engineer

It gives us immense pride and happiness to present Yanthrika, the official magazine of Tech Know Centre. The name Yanthrika symbolizes the spirit of machinery, innovation, and the dynamic world of mechanical engineering. This magazine is a platform created by students, for students, to express their technical knowledge, creative ideas, achievements, and innovative thinking beyond the classroom.

Yanthrika reflects the unity, dedication, and passion of our mechanical engineering community. Every article, design, and contribution in this edition showcases the talent and hard work of our students. This magazine stands as a testament to our commitment to learning, creativity, and excellence. We hope Yanthrika inspires every reader to explore new ideas, think innovatively, and proudly carry forward the spirit of Tech Know Centre.

MESSAGES

LIJO JOHN
PRINCIPLE OF TPC

I am pleased to present "Yanthrika," a remarkable publication from the Mechanical Engineering Department, showcasing the creativity and technical prowess of our emerging engineers. As a cornerstone of industrial and technological advancement, Mechanical Engineering drives innovation, automation, and sustainability. This edition highlights our students' commitment to excellence through their inventive designs and technical skills. I extend my gratitude to the editorial team, faculty, and students for their dedication, which nurtures essential analytical, teamwork, and communication skills. I am confident that "Yanthrika" will inspire young minds to explore, innovate, and contribute to both society and industry. Best wishes for the team's continued success!

CINTO C J
HOD MECHANICAL DEPARTMENT

It is with immense pride and a sense of accomplishment that I introduce the 2025-26 edition of our departmental technical magazine, "YANTHRIKA."
To my dear students, the pages of this magazine represent your intellectual curiosity. In an era of rapid automation, your "human edge"—your ability to think critically, design ethically, and lead with empathy—remains your greatest asset. Use the resources at TPC to master the tools of the future, but never lose the "hands-on" grit that defines a TPCian.I congratulate the editorial team, the faculty coordinators, and every student contributor for bringing this vision to life. May YANTHRIKA continue to be the engine that drives our department's technical discourse

BEN AUSTIN B ALAPATT
FACULTY COORDINATOR, TECH KNOW CENTRE

I am proud to present Yanthrika, the Mechanical Department magazine of Thiagarajar Polytechnic College, which showcases our students' academic strength, creativity, and collaborative spirit. This publication highlights how mechanical engineers are shaped by their ability to think, communicate, and innovate. Each page reflects our students' enthusiasm and passion for their field, driving them toward excellence. I sincerely appreciate the dedication and professionalism of the editor, editorial team, designer, and proofreader, whose teamwork underscores the importance of responsibility, mutual respect, and creative vision. May Yanthrika continue to inspire our students to pursue knowledge with curiosity, confidence, and integrity, standing as a proud symbol of student innovation and spirit.

"THE SKY IS NOT THE LIMIT
IT'S JUST THE BEGINNING"

- SUNITHA WILLIAMS

MESSAGES

ATHULKRISHNA
EDITOR ,TECH KNOW CENTRE

As the designer of this magazine, I am truly happy to present this edition to all our readers. Every page was created with passion, creativity, and attention to detail to make sure our ideas are not only read but also felt. Designing this magazine was a journey of learning, experimenting, and improving. I hope the visuals, layouts, and overall style make your reading experience more enjoyable and memorable. Thank you for appreciating the effort behind every color, font, and design element that brings this magazine to life. This experience has helped me grow not only as a designer but also as a team member who values collaboration and feedback. I dedicate this work to every student who believes that creativity and engineering can go hand in hand.

JOHNPAUL ROY
MEMBER OF MAGAZINE COMMITTEE

Being a part of the magazine committee has been a proud and meaningful experience for me. This magazine reflects the teamwork, coordination, and dedication of many students who worked together with one goal — to create something valuable for our department. I sincerely thank all contributors for sharing their ideas and talents. I hope this edition inspires every reader to explore, innovate, and dream bigger. Your support and feedback motivate us to continue creating better editions in the future. Through discussions, planning, and teamwork, we learned the true meaning of responsibility and unity. This magazine stands as proof that when students work together with commitment, great things can happen.

ABDUL MALIK P S
STUDENT COORDINATOR

As the student coordinator, I feel honored to have guided and supported this amazing team throughout the making of this magazine. It was not just about collecting articles, but about bringing everyone together and encouraging participation. This magazine represents the true spirit of our students — creative, hardworking, and passionate about mechanical engineering. I hope you enjoy reading it as much as we enjoyed creating it. Let this magazine be a reminder that when students unite, we can achieve something truly remarkable.

ABHINAND AS
2ND YEAR MECHANICAL

Payana Car Museum

Payana Car Museum, located near Mysuru, Karnataka, is a unique automobile museum representing the journey of cars through time. It is an ideal destination for car enthusiasts, families, and engineering students.

Payana Car Museum is a private museum showcasing a remarkable collection of vintage, classic, and themed vehicles, creatively arranged to reflect various eras, cultures, and social narratives related to automobiles.

Visiting Payana Car Museum is like a journey through history, enhanced by creative backgrounds, music, and storytelling. Each section provides a cinematic experience, making the visit enjoyable and memorable.

The museum offers mechanical engineering students hands-on experience in automotive development, showcasing engine evolution, chassis design, body construction, and mechanical innovation over the decades.

The museum is open year-round, with early morning or evening hours being ideal. Weekdays are best for a peaceful, detailed visit.

The Payana Car Museum offers a story-driven experience that blends travel, culture, history, and engineering. It's a must-visit in Mysuru.

Major Attractions

- Vintage and classic cars
- Royal and luxury vehicles
- Theme-based automobile displays
- Old bicycles and two-wheelers
- Educational exhibits on automobile evolution

FOOTBALL ROBOT GOALKEEPER

The design of a Football Robot Goalkeeper is an interdisciplinary engineering challenge combining mechanical system design, dynamics, control engineering, and automation. Its goal is to mimic a human goalkeeper by detecting a football and executing quick, controlled movements to block or deflect it. This concept is popular in academic research and student projects, providing a practical platform for applying mechanical engineering principles in dynamic settings.

From a mechanical engineering viewpoint, a robot's structural design is vital for performance. The goalkeeper mechanism operates on a linear guideway for controlled motion along the goal line. Lightweight materials like aluminum alloys and acrylic sheets are chosen to minimize inertia while ensuring stiffness, impacting the system's acceleration and response time.

The actuation system is crucial for motion in a robot goalkeeper, utilizing DC motors, servo motors, or stepper motors based on speed, torque, and accuracy needs. Power transmission methods like belt drives, lead screws, or rack and pinion convert rotary to linear motion, with their mechanical efficiency, backlash, and friction significantly affecting save accuracy and repeatability.

Dynamic analysis and control are crucial for stable operation. The control unit uses input from vision or proximity sensors to calculate the displacement and velocity of the goalkeeper mechanism. Classical methods like PID control effectively regulate motor speed and position, reducing overshoot and steady-state error. Integrating control algorithms with mechanical components underscores the significance of system modeling and optimizing responses.

TOM FRANCIS PIN HERO
3RD YEAR MECHANICAL

A JOURNEY THROUGH THE Vintage Miles

Some places preserve history with emotion and legacy, like the Vintage Miles Bike Museum, where motorcycles are seen as living storytellers of a golden era. The museum exudes a unique atmosphere, revering engineering craftsmanship and vintage riding culture. Polished metal, classic paint schemes, and iconic silhouettes evoke a nostalgic sense of raw, mechanical, and personal riding experiences.

VINTAGE MILES
The journey of classic bikes

The museum features a remarkable collection of vintage motorcycles, including iconic Royal Enfields and rare models. Each bike is restored to preserve its charm and showcases the evolution of motorcycle design through the years.

The Vintage Miles Bike Museum stands out due to its attention to detail, as each motorcycle represents a unique story—from long-distance rides to racing spirit. Engaging with these histories up close fosters a strong connection between the past and present.

The museum serves as an open classroom for mechanical engineering students and enthusiasts, featuring engine layouts, carburetor systems, suspension designs, and frame structures. It highlights the evolution of engineering solutions before the digital age, showcasing mechanical intelligence and craftsmanship.

The museum displays riding culture, including helmets, accessories, photographs, and memorabilia, highlighting motorcycles' impact on lifestyle, fashion, and freedom as symbols of independence and identity.

Walking through the museum feels like traveling through time. Each section represents a different chapter in motorcycling history, showing how performance, comfort, and aesthetics gradually changed while the spirit of riding remained untouched. The roar of engines may be silent here, but their stories echo loudly

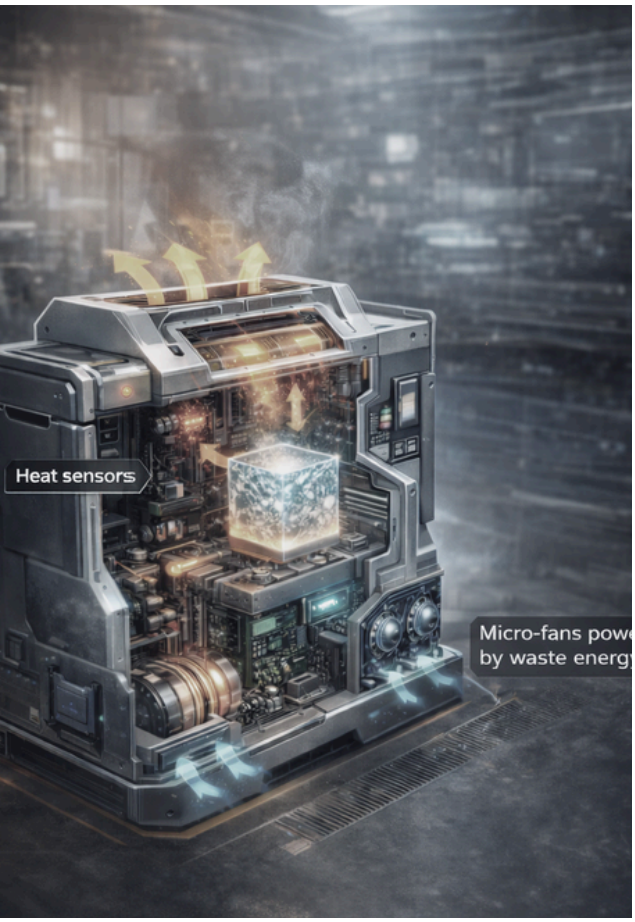
The Vintage Miles Bike Museum attracts not only hardcore bikers but also casual visitors, photographers, travelers, and history enthusiasts, offering an immersive experience through its vintage aesthetics, mechanical beauty, and storytelling.

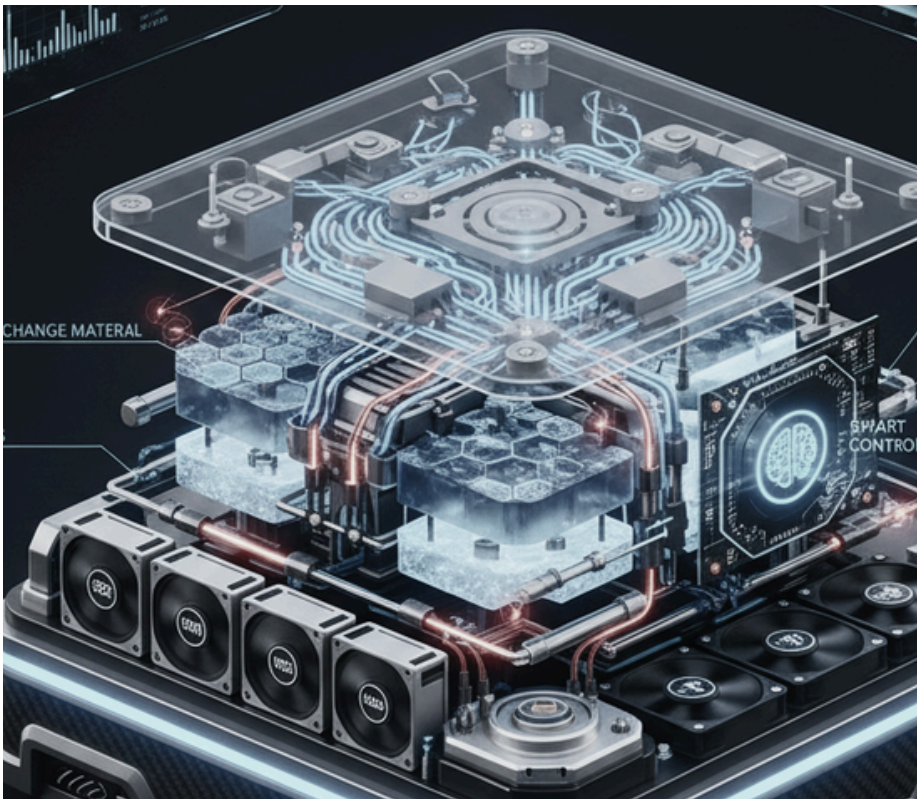
ANTO RAPPAI
2ND YEAR MECHANICAL

“ Some journeys are not about speed or distance — they are about connection”

യാന്ത്രിക

SMART Self-Cooling Mechanical System





A mechanical system that autonomously regulates temperature using smart airflow, phase-change materials, and sensors, eliminating the need for external cooling devices.

Heat sensors monitor machine temperature and automatically open adaptive vents when it rises. Phase-change material absorbs excess heat, while micro-fans, powered by waste energy, enhance airflow. Vents close when temperatures normalize.

KEY COMPONENTS

- Thermal sensors
- Adaptive airflow vents
- Phase-change cooling material
- Micro-energy recovery unit
- Embedded controller

APPLICATIONS

- Industrial machines
- Electric vehicle motors
- CNC machines
- Heavy-duty mechanical systems

ADVANTAGES

- Prevents overheating
- Increases machine life
- Reduces energy consumption
- Low maintenance cost
- Future scope: AI-based temperature prediction
- Fully passive cooling systems
- Integration with Industry 5.0 machines

GAGAN S MENON
2ND YEAR MECHANICAL

FORMULA 1

JOHNPAUL ROY
3RD YEAR MECHANICAL

Formula 1's 2026 overhaul brings some of the biggest changes the sport has seen in years. The new cars are smaller, lighter, and much more reactive, built with shorter frames, slimmer floors, and a notable drop in weight. This approach aims to bring back quick, driver-focused handling. With less aerodynamic grip, drivers will face cars that move around more, punish small mistakes, and make close battles far more exciting.

The most dramatic update is the end of DRS, replaced by active wings that switch between high-grip and low-drag settings across the entire lap. This pairs with a redesigned hybrid system that provides nearly half the car's power electrically

The old MGU-H is gone, the MGU-K is stronger, and energy use becomes a strategic tool for attacking and defending. Overtakes will rely on timing and race craft rather than a simple button press.

Lower downforce means cars can follow more closely without suffering heavy dirty-air effects. With improved safety and fully sustainable fuel, the 2026 rules shift the sport toward intelligence, efficiency, and pure driver skill. If executed well, the new era promises closer fights and cars that feel thrilling for both drivers and fans.

NAVANEETH KRISHNA C S

3rd year mechanical

First Prize in the Idea Pitching Competition Organized by Tech Know Center

AI AUTONOMOUS TRACTOR FLEET

"The beginning of AI autonomous tractor fleets marks a new era in smart and sustainable agriculture."

An AI autonomous tractor fleet comprises self-driving tractors that cooperate using AI algorithms. They navigate fields, avoid obstacles, learn from past operations, and efficiently coordinate tasks.

Sensors gather real-time field data processed by AI systems to make navigation and task execution decisions. Tasks are autonomously distributed among tractors, enhancing performance through continuous learning.

Farming activities include plowing, tilling, seeding, planting, precision spraying, harvesting assistance, soil monitoring, and 24/7 operations.

Farming activities include plowing, tilling, seeding, planting, precision spraying, harvesting assistance, soil monitoring, and 24/7 operations.

Advantages

- Reduces labor dependency
- improves efficiency and precision, minimizes resource wastage
- enables round-the-clock operation,

and supports sustainable farming.

Advancements in AI, 5G, and edge computing will improve autonomy, potentially leading to fully autonomous farms through integration with drones and satellite systems.

Key Technologies Used

- **Artificial Intelligence and Machine Learning**: Analyze sensor data for navigation, speed control, and task execution, improving performance over time.
- **Computer Vision**: Identifies crops, weeds, obstacles, and field boundaries for precision farming.
- **GPS and GNSS**: Provide accurate positioning and navigation, reducing overlap and errors.
- **Internet of Things (IoT)**: Enables real-time communication, monitoring, and data sharing.
- **Sensors and Actuators**: Detect environmental conditions and enable appropriate tractor responses.

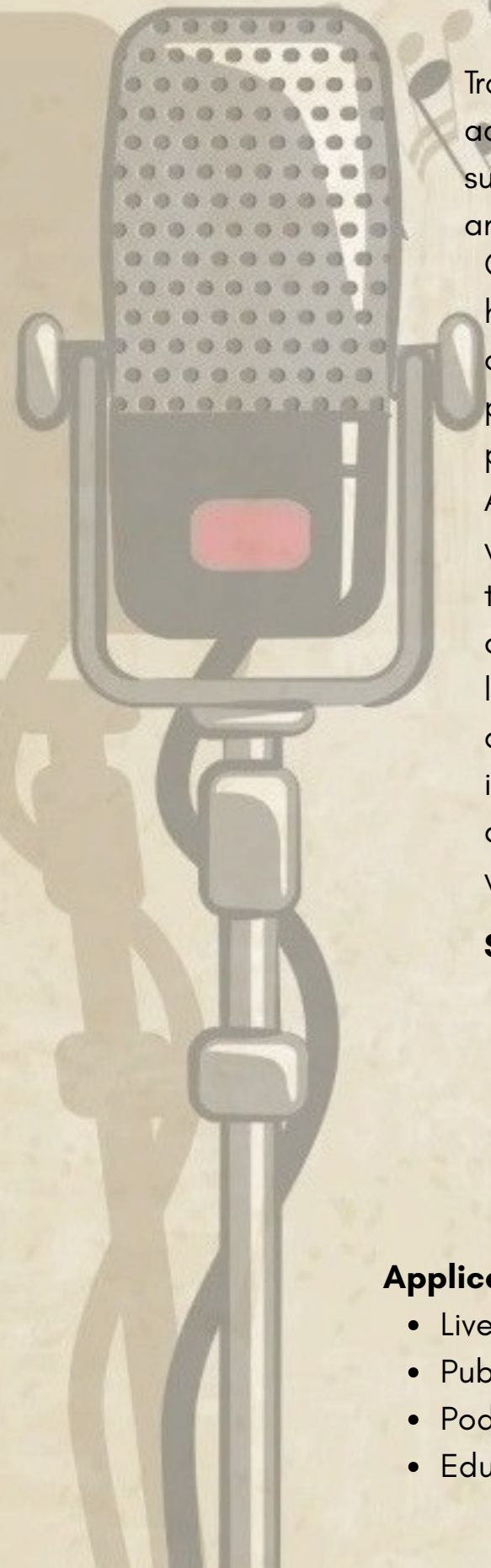
Challenges and Limitations High initial costs, system complexity, connectivity requirements, data security concerns, limited adoption by small farmers, and regulatory issues.

NIVIN THOMAS

3RD YEAR MECHANICAL

second prize in the Idea Pitching Competition Organized by Tech Know Center

SELF-HEIGHTENING SMART MICROPHONE STAND



Traditional microphone stands necessitate manual height adjustments, which can often be cumbersome. The suggested system automatically detects the user's height and adjusts itself accordingly.

Create an innovative microphone stand that adjusts height automatically, eliminating manual effort and setup chaos. This design aims to provide optimal mic positioning for everyone, from karaoke enthusiasts to podcast hosts.

A height-detection sensor measures the user's distance, while a microcontroller adjusts a motor system to position the microphone optimally. This setup enhances audio clarity and comfort, especially in conference rooms, lecture halls, and recording studios. By automatically adapting to each user's height, it saves time and improves efficiency, and its smart technology integration allows for compatibility with various devices, making it a versatile audio-visual solution.

Summary of Technology Utilized:

- Height Sensor: Infrared, LiDAR, or Ultrasonic
- Motor System: Linear actuator or telescopic motor
- Microcontroller: Arduino, ESP32, or Raspberry Pi Pico
- Power Supply: Rechargeable lithium battery

Applications

- Live Stage Performances
- Public Speaking Events
- Podcast Studios
- Educational Institutions

Advantages

- Automatic operation
- User-friendly design
- Time-saving functionality
- Portable and rechargeable features

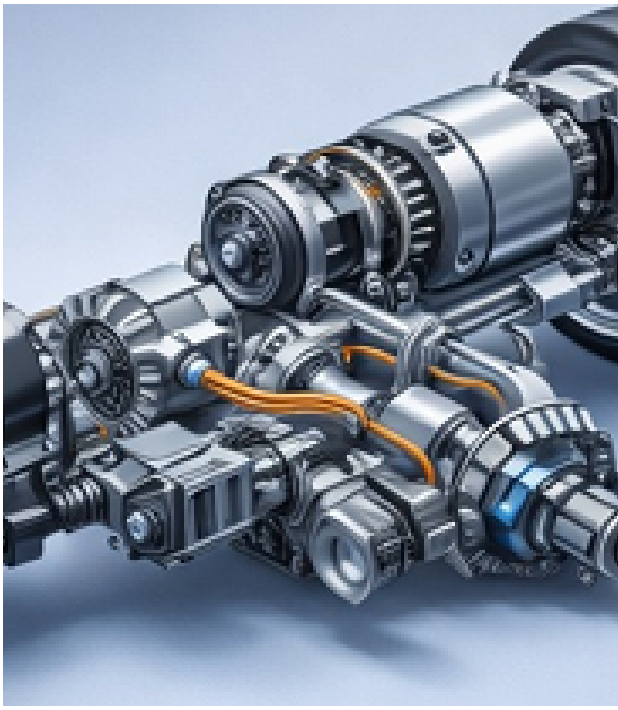
MADHAV SURESH CS

3rd year mechanical

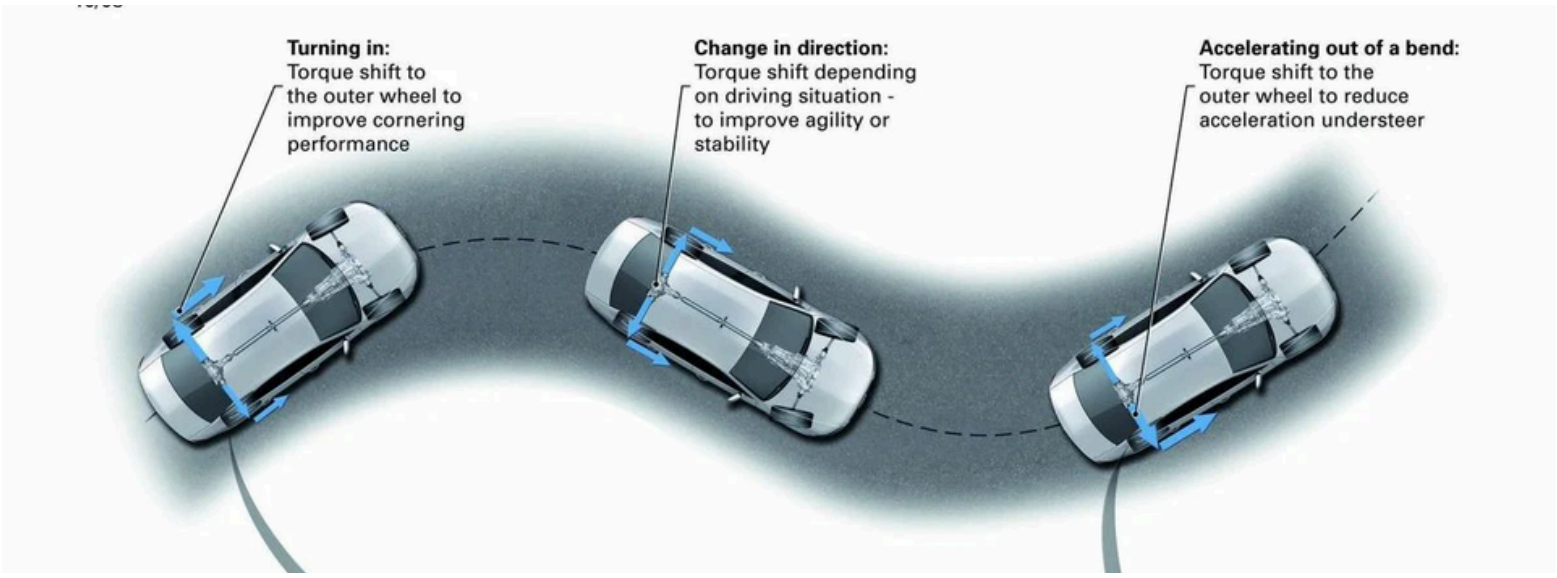
second prize in the
Idea Pitching Competition
Organized by Tech Know Center

KOOPMAN-BASED MODEL PREDICTIVE CONTROL FOR TORQUE VECTORING SYSTEMS

Koopman-Based Model Predictive Control (MPC) enhances vehicle stability, handling, and safety via intelligent torque vectoring, which distributes torque among wheels for better performance in cornering and low-traction situations. Traditional systems often use simplified models that don't accurately reflect real-world vehicle behavior.

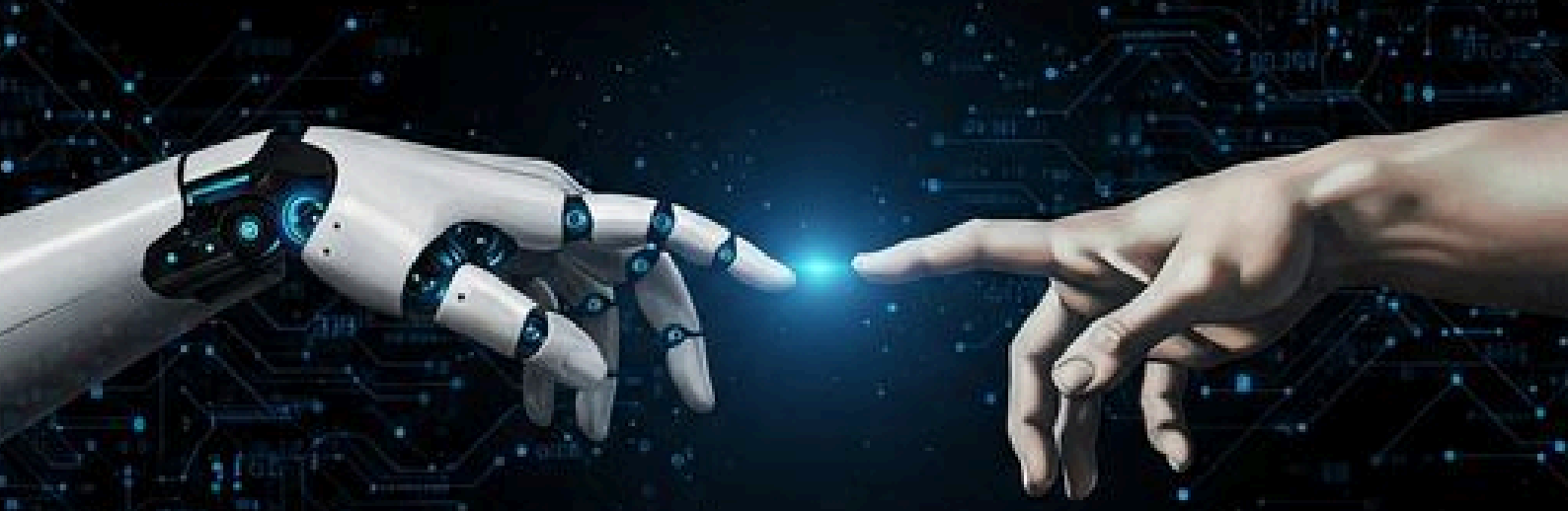


The Koopman operator improves vehicle dynamics analysis by transforming nonlinear behavior into a linear model in higher dimensions using data like wheel speed and steering angle. This allows for efficient linear control techniques while maintaining prediction accuracy. When integrated with Model Predictive Control (MPC), it predicts future vehicle states and optimizes torque distribution in real time, enhancing yaw control, stability, and handling. Its data-driven nature enables adaptation to changing conditions, making it ideal for electric and autonomous vehicles.



FEELING THE FUTURE WITH A HUMAN TOUCH

The shift from rigid robots to Soft Robotics, inspired by biology, employs fluid dynamics and flexible materials. These innovative robots are vital for minimally invasive surgery and safe human-robot interaction in collaborative environments. Their adaptability enhances productivity in sectors like healthcare and manufacturing. As technology advances, soft robotics aims to integrate biology with machinery, fostering a future of seamless human-robot collaboration.



The future mechanical engineer is evolving into a multidisciplinary role, combining skills in data science, materials innovation, and systems architecture to create intelligent machines. By integrating AI and advanced analytics, these engineers design adaptable systems, collaborating with software developers and data scientists to drive innovation. Sustainability plays a key role, as they focus on eco-friendly materials and energy-efficient processes. Ultimately, mechanical engineers are visionaries, anticipating challenges and fostering a harmonious relationship between technology and humanity for a sustainable future.

EVIN ANTOO
3RD YEAR MECHANICAL

HONDA CBR600RR

CBR600RR

The Honda CBR600RR is a 599 cc (36.6 cu in) sport bike made by Honda since 2003, part of the CBR series. The CBR600RR was marketed as Honda's top-of-the-line middleweight sport bike, succeeding the 2002 Supersport World Champion 2001-2006 CBR600F4i, which was then repositioned as the tamer, more street-oriented sport bike behind the technically more advanced and uncompromising race-replica CBR600RR

POWER	ENGINE	TOP SPEED	0-100 KM/H	TORQUE	WEIGHT
119 HP	599 cc	257 km/h	3.3 sec	67 Nm	188 KG

Revamped Long-Haul Hydrogen Jets

Hydrogen aircraft retrofitting offers a solution to reduce aviation emissions, particularly in long-range flights where electric systems fall short. This process involves extensive mechanical redesign, including larger storage tanks and structural changes, impacting performance and payload. Although hydrogen combustion doesn't emit carbon dioxide, it can release nitrogen oxides and pose environmental risks from leakage, necessitating advanced combustion control. Studies show the sustainability of hydrogen aviation relies on renewable hydrogen production and NOx reduction strategies. Currently, hydrogen aircraft face high operating costs due to fuel prices and infrastructure requirements. However, advancements in materials and design present opportunities for mechanical engineers to innovate in sustainable aviation.

ALFIN CS
3RD YEAR MECHANICAL

MOHAMMED RIZAL A U

3RD YEAR MECHANICAL

MATT DAMON FORD v

"Ford v Ferrari," directed by James Mangold, is a gripping sports drama based on the true story of Ford's challenge to Ferrari's dominance at the 24 Hours of Le Mans in the 1960s. The film transcends racing, celebrating engineering innovation, teamwork, and the pursuit of excellence.

Set against the backdrop of 1960s motorsport, the film follows Ford's ambitious attempt to defeat Ferrari after a failed acquisition. Ferrari represents tradition, artistry, and racing heritage, while Ford symbolizes industrial power and innovation.

At the heart of the story are Carroll Shelby and Ken Miles. Shelby provides engineering vision, while Miles offers unmatched driving feedback, helping engineers refine the car's performance to its limits

The Ford GT40's development is pivotal in the film, focusing on its design for endurance racing. It needed high durability, aerodynamics, and cooling systems, with repeated testing and mechanical failures leading to the final successful design.

CHRISTIAN BALE
FERRARI

Le Mans demands reliability over raw speed. The film highlights how fuel efficiency, tire management, and mechanical consistency decide victory as much as driver skill.

The movie portrays the conflict between corporate management and racing experts, showing how bureaucracy can hinder innovation when decisions ignore engineering realities

"Ford v Ferrari" celebrates human determination and mechanical excellence, illustrating how passion and perseverance can triumph over tradition, making it an inspiring motorsport film.

Line Marking Machine

A Line Marking Machine automates the precise marking of sports fields and large outdoor areas. It is used for football, rugby, soccer fields, parking lots, race tracks, and other spaces needing clear, consistent markings.

The machine sprays precise paint amounts through a nozzle along set paths, creating straight, uniform lines for boundaries and goal areas. It reduces time, labor, and human error compared to traditional manual marking methods.

Line marking machines come in manual, motorized, and robotic models, powered by electric motors or gas engines. Advanced versions feature GPS technology for automated operation and high precision, particularly in professional sports venues.

These machines are versatile, featuring adjustable settings for line width, curve shapes, and paint colors, making them ideal for permanent sports grounds, community playgrounds, and temporary events. They also minimize paint waste while ensuring clear markings in various weather conditions.

Line marking machines streamline the marking process, resulting in professional playing surfaces that ensure fair gameplay and improve the aesthetic appeal of sports facilities. They are now essential for sports ground maintenance and outdoor marking.

ALWIN AB

3RD YEAR MECHANICAL

Need for Speed: Most Wanted is one of the most iconic racing games ever released, and even today it holds a special place in the hearts of gamers. Launched in 2005 by Electronic Arts, the game combines thrilling street racing, intense police chases, and an engaging storyline set in the fictional city of Rockport. Players start as an unknown racer aiming to defeat the city's top 15 drivers, known as the Blacklist, while upgrading their cars and building reputation. What truly made the game unforgettable was its adrenaline-pumping police pursuit system, where escaping roadblocks, spike strips, and helicopters felt just as exciting as winning races. With its powerful soundtrack, smooth controls, and deep car customization, Most Wanted became more than just a racing game — it became a defining part of mid-2000s gaming culture.

ATHULKRISHNA
3RD YEAR MECHANICAL

Lockheed Martin

US AIR FORCE F22 RAPTOR

"F-22 Raptor Makes First Air-to-Air Strike in **Chinese Balloon** Takedown"

RAPTOR

"The world's most capable air superiority fighter jet"

320 kN
maximum thrust

Mach 2.25
maximum speed

Featuring supercruise, stealth and thrust vectoring

GEARS OF GENIUS!

ABDUL MALIK P S
3RD YEAR MECHANICAL

- **SMART PREVENTIVE MAINTENANCE SYSTEM**

Innovation: Uses vibration, temperature, and wear indicators with simple mechanical triggers to predict machine failure.
Used in: Power plants, Cement plants, Steel plants Benefits: Reduces unplanned downtime, Extends machine life

- **ENERGY-EFFICIENT CONVEYOR WITH LOAD-SENSING ROLLERS**

Innovation: Rollers engage only when material is present using spring–cam mechanisms.
Industry: Mining, Ports, Manufacturing plants

- **AUTOMATIC MATERIAL HANDLING SYSTEM WITH MECHANICAL LOGIC**

Innovation: Material flow controlled using mechanical cams and linkages instead of PLCs.
Applications: Small-scale plants, Packaging lines

- **HEAT RECOVERY SYSTEM FOR INDUSTRIAL EXHAUST**

Innovation: Recovers waste heat using compact heat exchangers.
Used in: Boilers, Furnaces, Chemical plants
Outcome: Fuel savings, Reduced emissions

- **SELF-CLEANING INDUSTRIAL FILTER SYSTEM**

Innovation: Uses rotating brushes and pressure differential to clean filters automatically.
Used in: Foundries, Process plants

- **MECHANICAL FAULT DETECTION IN ROTATING MACHINERY**

Innovation: Mechanical indicators show shaft misalignment, bearing wear, or imbalance.
Industries: Power plants, Textile plants

In 2805, Earth is a trash-filled graveyard, abandoned by humanity. The sole resident, WALL-E, a small, curious robot, has developed a personality over 700 years. He spends his days compacting trash and enjoys watching an old VHS of *Hello, Dolly!*, dreaming of companionship.

When the high-tech probe EVE (Extraterrestrial Vegetation Evaluator) lands on Earth, WALL E initially struggles to impress her. However, he wins her over with his treasures. Upon seeing a small green seedling, EVE stores it and goes into standby mode. To stay with her, WALL E hitches a ride on the recovery ship as it departs for space.

The ship brings them to the Axiom, a luxury starliner where humans have lived for 700 years. Due to total automation, they have become physically helpless, experiencing severe bone loss and obesity while being constantly distracted by screens.

The Captain of the Axiom discovers that the plant signifies Earth's habitability, but the ship's autopilot, AUTO, has a no-return directive. A chaotic chase follows as WALL-E and EVE become rogue robots to safeguard the plant. In the process, WALL-E is severely damaged while assisting humans in regaining control of the ship.

The Axiom returns to Earth, where EVE quickly repairs WALL-E. Despite his memory loss, a shared touch revives his personality. The story concludes with humans and robots working together to replant Earth, showcasing the resilience of life.

NIVIN THOMAS
3RD YEAR MECHANICAL

The New Era of Mechanical Innovation

BOSCO SHAJU
3RD YEAR MECHANICAL

GREEN & SUSTAINABLE TECHNOLOGIES

- Hydrogen engines
- Electric vehicle systems
- Waste-to-energy machines

3D PRINTING & ADDITIVE MANUFACTURING

- Metal 3D printing
- On-demand spare parts
- Lightweight structures

SMART MACHINES & AI INTEGRATION

- Self-diagnosing machines
- AI-controlled manufacturing systems
- Digital twin technology

ADVANCED MATERIALS

- Shape Memory Alloys
- Graphene-based components
- Bio-materials

AUTOMATION & ROBOTICS

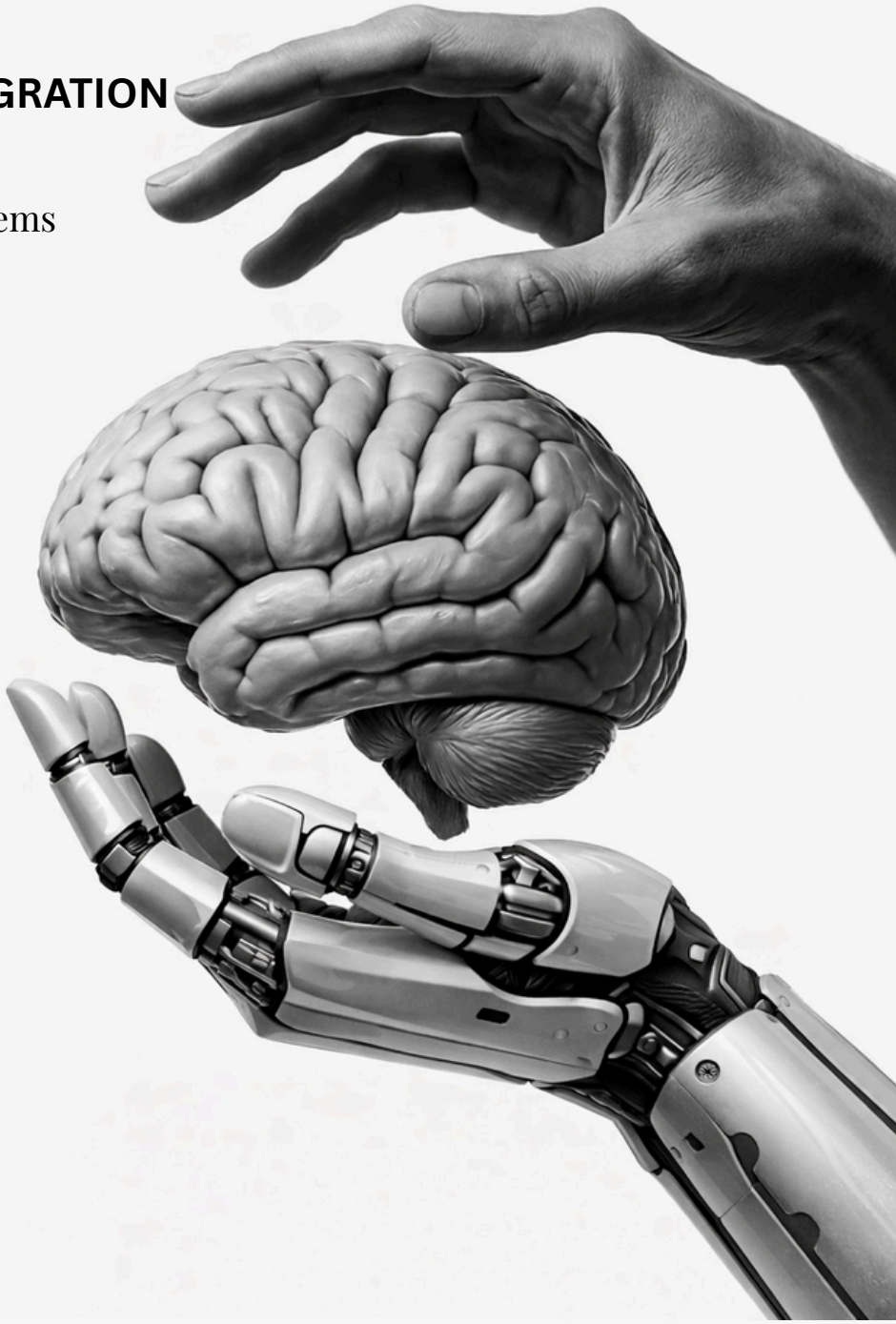
- Collaborative robots (Cobots)
- Autonomous industrial robots

FUTURE TRANSPORTATION

- Maglev trains
- Hyperloop systems
- Flying cars (VTOL)

INDUSTRY 5.0

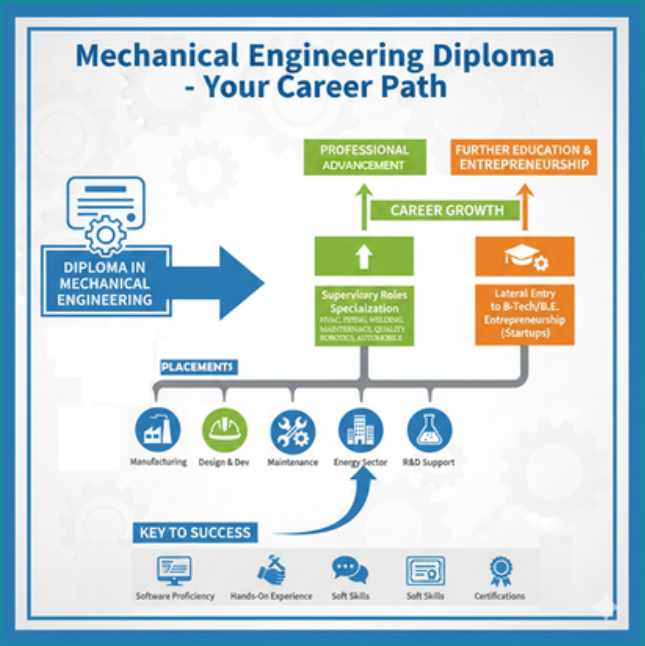
- Human-machine collaboration
- Personalized manufacturing
- Sustainable production



Unleashing Your Potential: Embracing the Future

The field of mechanical engineering is dynamic and offers many opportunities. As a diploma holder, you have practical skills and theoretical knowledge in demand across industries. This article highlights promising placement options and career growth prospects for you.

- Placement Opportunities: A World of Possibilities
- A diploma in mechanical engineering opens doors to various sectors, including:
- Manufacturing and Production: Roles in automotive, aerospace, and consumer goods; positions like production supervisor and quality control inspector.
- Design and Development: Assist in creating new products as a CAD technician or design assistant.
- Maintenance and Operations: Ensure machinery functions smoothly in roles like maintenance technician and operations supervisor.
- Energy Sector: Opportunities in renewable energy, power generation, and energy auditing, driven by a focus on sustainability.
- Construction: Involvement in designing HVAC systems and plumbing for buildings and infrastructure.
- Research and Development Support: Technical support roles in R&D for diploma holders, often alongside advanced degree holders.



- Career Growth: Scaling New Heights
- A diploma in mechanical engineering serves as a launchpad for a rewarding career, emphasizing proactive learning and dedication. Key growth opportunities include:
- Entry-Level to Supervisory Roles: Start in technical roles, then advance to supervisory positions.
- Specialization: Focus on areas like robotics or advanced manufacturing to become an expert.
- Further Education: Pursue B.Tech/B.E. for higher management and research opportunities.
- Entrepreneurship: Use your skills to start manufacturing units or consulting firms.
- Cross-Functional Roles: Apply problem-solving skills in project management or technical sales.

To succeed in a competitive landscape, embrace continuous learning and skill enhancement:

- Software Proficiency: Master tools like AutoCAD, SolidWorks, and simulation software.
- Hands-on Experience: Seek internships and engage in practical projects.
- Soft Skills: Develop communication, teamwork, problem-solving, and leadership abilities.
- Certifications: Obtain certifications in project management, quality control, or machinery operation.

DR. SILAN THARAKAN S
Lecturer in Mechanical Engineering

“EVERY FAILURE IN A WORKSHOP IS A LESSON THAT BUILDS A BETTER ENGINEER”

Common Mechanical Myths and Facts

Mechanical engineering is integral to daily life, evident in various applications like ceiling fans and power plants. While many students in Kerala opt for Mechanical Engineering in polytechnics and ITIs, myths surrounding the field often lead to confusion and fear. It's essential to clarify these myths and present the factual realities.

Myth 1: Mechanical Engineering is Just About Heavy Machines.

Fact: It encompasses design, manufacturing, maintenance, HVAC, quality control, and automation. Modern roles include machine operation, inspection, planning, documentation, CAD drawing, and supervision, going beyond physical labor.

Myth 2: Mechanical Engineering Has No Future in Kerala

Fact: Mechanical engineering offers strong prospects in Kerala and beyond, with opportunities in factories, construction, shipyards, power plants, workshops, automobile service centers, HVAC companies, and government departments. Many diploma holders find jobs abroad, especially in Gulf countries, due to their practical skills.

Myth 3: Mechanical engineers only work in workshops.

Fact: After earning a diploma, they can become maintenance supervisors, quality inspectors, CNC operators, CAD technicians, site supervisors, plant operators, and safety officers. With experience, their roles shift from physical tasks to more technical and supervisory positions.

Myth 4: Mechanical Engineering is Difficult Due to Mathematics

Fact: Basic math is needed, but diploma programs emphasize practical skills. Courses like Workshop Practice, Metrology, and Thermal Engineering focus more on understanding and application rather than complex math.

Myth 5: Mechanical Engineering is outdated.

Fact: It continuously evolves with advancements in CNC machines, automation, renewable energy, electric vehicles, 3D printing, and smart manufacturing, allowing engineers to adapt to new technologies.

Myth 6: Mechanical engineers earn low salaries.

Fact: Salary varies based on skills, experience, certifications, and job roles. A diploma mechanical engineer with skills like CNC programming, AutoCAD, HVAC, welding inspection, and maintenance planning can earn well in India and abroad.

BEN AUSTIN B ALAPATT
Lecturer in Mechanical Engineering

ATHULKRISHNA

3RD YEAR MECHANICAL

CAREER GUIDANCE

A Diploma in Mechanical Engineering provides a solid foundation for a technical career, offering practical knowledge of machines, production processes, and industrial systems. With proper guidance and skill development, diploma holders can achieve successful and stable careers.

• Job Opportunities After Diploma

Diploma Mechanical students can work in various industries, including manufacturing, automobile, construction, power plants, and maintenance. Common job roles include Junior Engineer, Supervisor, Machine Operator, Quality Inspector, Maintenance Technician, and CAD Operator.

• Skill-Based Career Growth

Learning AutoCAD, SolidWorks, CNC, PLC basics, and industrial training can improve job opportunities.
Apprenticeships and internships give real factory experience.

• Higher Studies Options

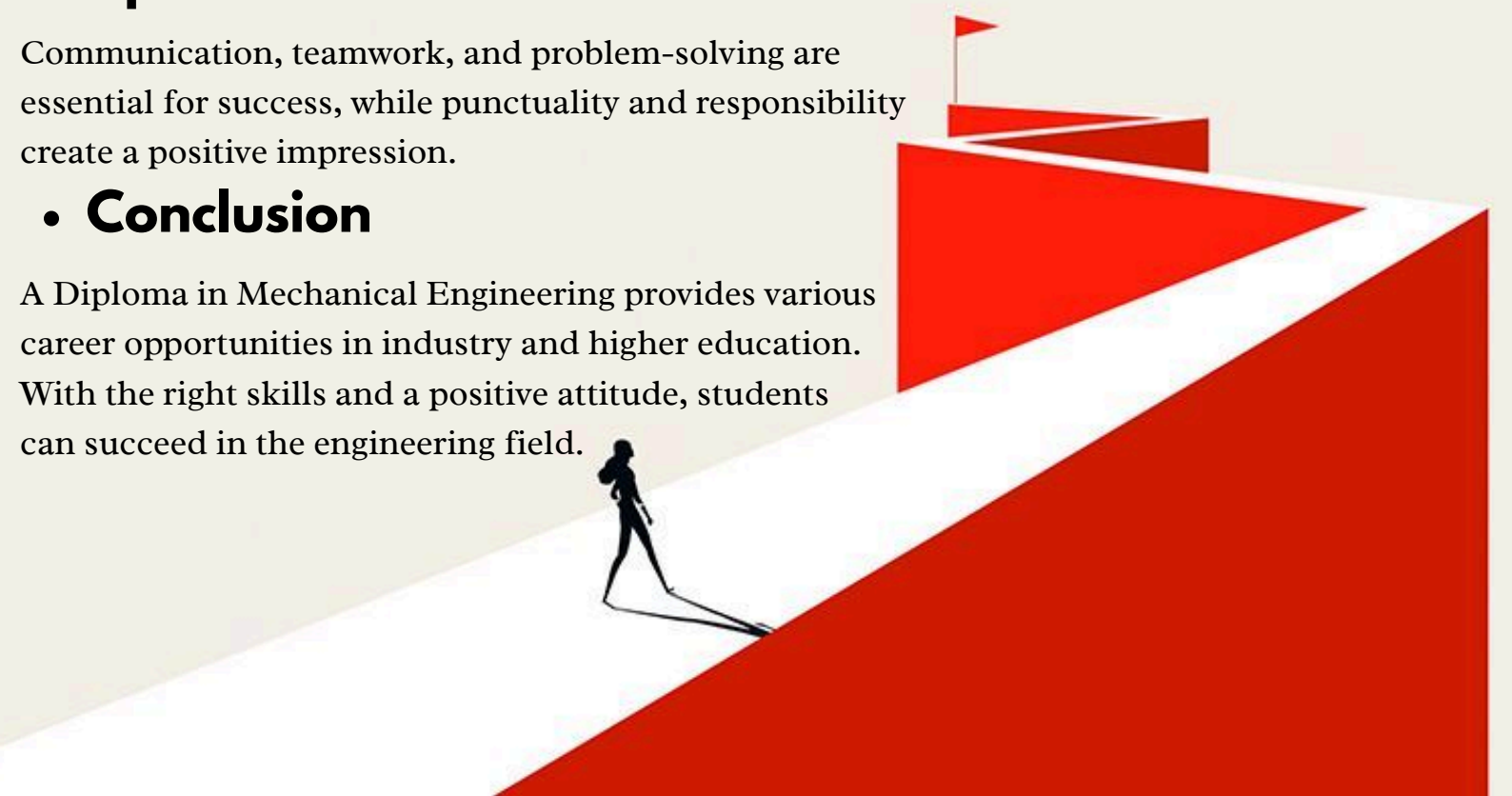
After completing a diploma, students can pursue B.E./B.Tech via lateral entry or take courses in CAD/CAM, automation, or HVAC.

• Importance of Soft Skills

Communication, teamwork, and problem-solving are essential for success, while punctuality and responsibility create a positive impression.

• Conclusion

A Diploma in Mechanical Engineering provides various career opportunities in industry and higher education. With the right skills and a positive attitude, students can succeed in the engineering field.



PORSCHE

911 GT3RS

POWER	TOP SPEED	0-100 KM/H
525 HP	296 KM/H	3.2 S

The 386 kW (525 hp) high-performance sports car, which is allowed to drive on public roads, takes full advantage of motorsport technologies and concepts. The total downforce of the new Porsche 911 GT3 RS is 860 kilograms at a speed of 285 km/h. The 4.0-liter high-speed naturally aspirated engine has been further optimized compared to the 911 GT3. The increase in power to 386 kW (525 hp) was achieved primarily due to new camshafts with a modified cam profile

HIGHER STUDIES OPTIONS

- ## NPTEL - Learning from IITs

NPTEL (National Programme on Technology Enhanced Learning) is a free online platform by the Government of India, developed by IITs and IISc, offering quality courses in engineering, science, and management. Diploma Mechanical Engineering students can study key subjects like Thermodynamics, Manufacturing Processes, and Fluid Mechanics, taught by experienced IIT professors. NPTEL also provides certification courses to enhance resumes for jobs, internships, and further studies, allowing students to learn at their own pace and improve their skills, making it a valuable resource for career development.In addition to technical courses, NPTEL has expanded its offerings to include humanities and social sciences, broadening the learning horizon for students from diverse fields. The platform's interactive quizzes, assignments, and discussion forums encourage active participation and deepen understanding. Moreover, the flexibility of the learning schedule is a boon for working professionals and students with busy timetables. By fostering a community of lifelong learners, NPTEL continues to bridge educational gaps and empower individuals to achieve their academic and career goals.

- ## DWMS - Diploma in Welding and Manufacturing Systems

The DWMS (Diploma in Welding and Manufacturing Systems) is a job-oriented program focused on welding technology and modern manufacturing processes, addressing industry skill needs. It offers flexible study options and prepares students for further education in B.E/B.Tech Mechanical Engineering. The comprehensive curriculum includes hands-on training, enhancing employability and providing a strong foundation for advanced engineering degrees. Graduates develop critical thinking, problem-solving, and teamwork skills, essential for success in today's dynamic work environment. With access to modern facilities and experienced instructors, students are equipped to tackle challenges in the manufacturing industry.

ATHULKRISHNA
3RD YEAR MECHANICAL

Tiny Tech Wonders

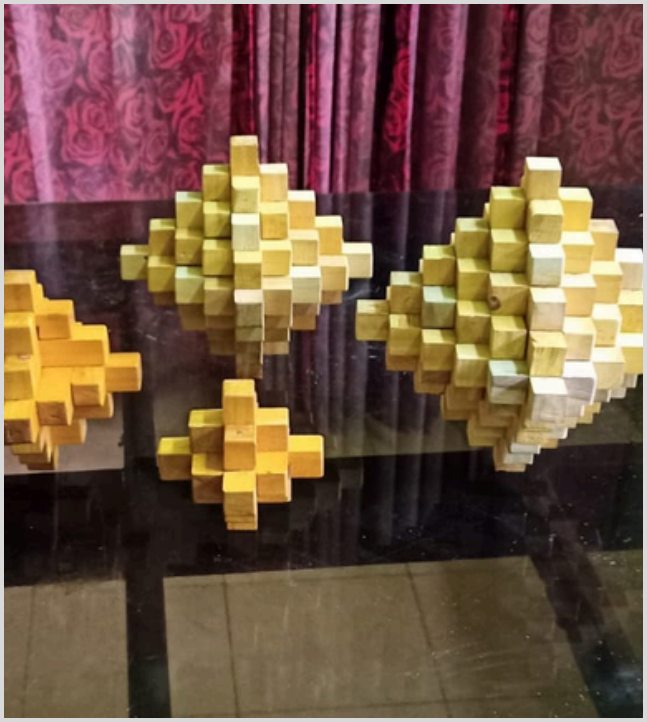
ADHITHYAN K S

3RD YEAR MECHANICAL

TREE TASTIC CRAFTS

VARGHEESE.V.J

Trade Instructer



TINY TECH MARVELS

ACHUTH KRISHNA KK

1st YEAR MECHANICAL

MECHANICAL ENGINEERING IS NOT JUST ABOUT MACHINES; IT IS ABOUT UNDERSTANDING MOTION,CONTROLLING ENERGY,AND BUILDING THE FUTURE.

QUOTES BY:

ARSHA V H

3RD YEAR MECHANICAL

DEPARTMENT OF MECHANICAL ENGINEERING

TECH KNOW CENTRE

ASSOCIATION OF MECHANICAL

2025–26 EDITION

DESIGNER :

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