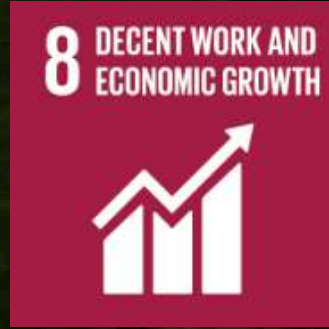


MECHANICAL GRADUATE ROADMAP



KUMARAGURU
Institutions

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About the Department

The Department of Mechanical Engineering, established in 1984, is one of the most dynamic and progressive departments of the institution. Over the years, it has evolved into a center of excellence in teaching and research, offering a balanced blend of theoretical knowledge and practical exposure. Equipped with state-of-the-art workshops, advanced laboratories, and modern computing facilities, the department meets the growing demands of contemporary engineering education.

With a team of highly qualified and experienced faculty members, the department ensures quality instruction and guidance across all domains of mechanical engineering. Accredited by the **National Board of Accreditation (NBA)** in 2019 and recognized as a **Research Center by Anna University** since 2003, the department consistently upholds high academic standards while promoting innovative research in emerging fields. Faculty members actively publish in reputed journals and engage in research and consultancy projects that strengthen the department's academic and industrial linkages.

Beyond academics, the department emphasizes the holistic development of students through extracurricular and co-curricular activities, encouraging leadership, teamwork, and creativity. Regular guest lectures and industrial visits bridge the gap between classroom learning and real-world applications. With a forward-looking vision, the department continues to nurture competent, ethical, and innovative engineers ready to make meaningful contributions to industry, research, and society.

Our Proud Alumni Network

Graduates from the Department of Mechanical Engineering have excelled across multiple domains, shaping innovation and leadership in every field they step into and With a strong global presence, the Department of Mechanical Engineering takes pride in its **3682** distinguished alumni who are making remarkable contributions across India and around the world, driving innovation, leadership, and excellence in every field they pursue.

Mechanical Entrepreneurs in Various Divisions

- **Automobile Components Manufacturing** – Innovating precision parts and systems for automotive excellence.
- **Defense Product Vendors** – Contributing to India's defense strength through design and manufacturing.
- **Textile Sector** – Driving efficiency and modernization in textile machinery and processes.
- **Food-Related Products** – Engineering smarter solutions for food processing and packaging.
- **HVAC Systems** – Enhancing comfort through advanced heating, ventilation, and cooling technologies.
- **Fisher Pumps** – Leading in fluid mechanics and industrial pump innovations.

Our Alumni in Leading Organizations

- **L&T** – Infrastructure and engineering excellence.
- **Alstom** – Powering sustainable mobility and transport solutions.
- **Oracle** – Integrating mechanical expertise with digital innovation.
- **JP Morgan** – Showcasing analytical and technical leadership in finance.
- **MIQ Digital India** – Bridging mechanical systems with digital transformation.

- **TVS** – Leading as Digital Heads in mobility innovation.
- **Ansys** – Serving as National Technical Managers driving simulation technology.
- **TATA Motors** – Shaping the future of automotive engineering.
- **Nayara Energy** – Advancing energy production and refinery operations.
- **Hindustan Aeronautics Limited (HAL)** – Strengthening India's aerospace capabilities.
- **Goldman Sachs** – Leveraging mechanical problem-solving in strategic domains.
- **Defense Sector** – Serving the nation with engineering excellence and innovation.

Institute Vision:

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

Institute Mission:

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

Department Vision:

To achieve global recognition for the programs of the department by promoting innovation, sustainability, and leadership, contributing to the society.

Department Mission:

1. To promote innovation in the Mechanical Engineering through curriculum, focusing on sustainability and ethical practices.
2. To create an active learning ecosystem for acquiring knowledge and skills in Mechanical Engineering.
3. To facilitate research in mechanical systems and sustainable technologies that have an impact on industry and society.

Program Educational Outcomes (PEO's):

PEO 1: Graduates to pursue careers in Mechanical engineering and allied fields.

PEO 2: Graduates to engage in the execution of multi-disciplinary engineering activities.

PEO 3: Graduates to pursue professional development programs in Mechanical Engineering Science and Management.

Knowledge and Attitude Profile (WK):

WK1: A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.

WK2: Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline.

WK3: A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

WK4: Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

WK5: Knowledge, including efficient resource use, environmental impacts, whole-life cost, reuse of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area.

WK6: Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.

WK7: Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development.

WK8: Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.

WK9: Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.

Program Outcomes (POs)

Graduates of the Mechanical Engineering Program should have the ability to:

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).



PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for
i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change.

Program Specific Outcomes (PSO's):

1. Apply the fundamentals of science and mathematics to solve complex problems in the field of design and thermal sciences.
2. Apply the concepts of production planning and industrial engineering techniques in the field of manufacturing engineering.

STRENGTHEN CORE FUNDAMENTALS

1

- Engineering Drawing & GD&T (Geometric Dimensioning & Tolerancing)
- Mechanics of Materials
- Manufacturing Processes
- Thermodynamics & Fluid Mechanics for product context

LEARN CAD SOFTWARE (INDUSTRY STANDARD)

2

Beginner Level

- **AutoCAD** (2D Drafting, Basic 3D)

Intermediate Level

- **SolidWorks / Creo** (3D Modelling, Assemblies, Sheet Metal, Surfacing)
- **CATIA / NX** (for Automotive & Aerospace industries)

Pro Level

- Advanced Surface Modeling
- Motion Simulation

MASTER DESIGN TOOLS & ANALYSIS

3

- **CAE** (Computer Aided Engineering)
- **ANSYS / Abaqus** (Structural, Thermal, Vibrational analysis)
- **CFD** (Computational Fluid Dynamics)
- **ANSYS Fluent / Star-CCM+** (for fluid & thermal design)
- **CAM** (Computer Aided Manufacturing)
- **MasterCAM / NX CAM** (for product manufacturing)

GET INDUSTRY PRACTICES

4

- **PLM** (Product Lifecycle Management) – Teamcenter, Windchill
- **DfX** (Design for Manufacturing, Assembly, Costing)
- **D-RAP** (Design Review and Approval Process)

GET INDUSTRY EXPOSURE

5

- **Internships / Projects** in Automotive, Aerospace, or Consumer Product Design
- Reverse Engineering → scan to CAD → prototype
- Work on real-life case studies & portfolio building

DEVELOP FUTURE-READY SKILLS

6

- CAD Automation (Python, VBA, MATLAB for design tasks)
- Data-driven Design (AI, ML integration with CAD)
- 3D Printing / Additive Manufacturing (for rapid prototyping)

1. FOUNDATION

GOAL

Build strong fundamentals in math, physics, and mechanical basics.

SKILLS TO DEVELOP

- Engineering Graphics (CAD basics)
- Drafting (AutoCAD basics)
- Understanding mechanical measurements & tools
- Safety awareness in workshops

2. MECHANICAL CORE

GOAL

Learn basic mechanical sciences and introduction to manufacturing.

CORE SUBJECTS

- Strength of Materials
- Thermodynamics
- Fluid Mechanics
- Material Science & Metallurgy
- Manufacturing Processes.

SKILLS TO DEVELOP

- Manual machining (lathe, milling, drilling, grinding)
- Metallurgy basics (heat treatment, microstructures)
- 2D/3D CAD design (SolidWorks/Creo)

4. ADVANCED & INDUSTRY READINESS

GOAL

Integrate automation, modern technologies, and management.

CORE SUBJECTS

- Robotics & Automation
- Additive Manufacturing (3D Printing, AM processes)
- Industrial Safety & Maintenance
- Supply Chain & Production Planning
- Elective Options (Smart Manufacturing, IoT, Sustainable Manufacturing)

SKILLS TO DEVELOP

- PLC, SCADA basics (automation)
- Additive Manufacturing (FDM, SLM, DMLS)
- Industry 4.0 concepts (IoT, Digital Twin, Smart Factories)
- Project Management (MS Project, Primavera)

3. MANUFACTURING SPECIALIZATION

GOAL

Focus on advanced manufacturing methods and automation.

CORE SUBJECTS

- Manufacturing Processes – II (CNC, non-traditional machining – EDM, ECM, Laser cutting)
- Machine Design
- Metrology & Quality Control
- Computer Integrated Manufacturing (CIM)
- Industrial Engineering & Operations Research

SKILLS TO DEVELOP

- CNC programming (G & M codes)
- Quality inspection (CMM, GD&T, tolerance analysis)
- Lean manufacturing basics, Six Sigma
- CAM software (MasterCAM, Fusion 360)

INTERSHIPS/PROJECTS

- Short-term industry training in machining/fabrication/automation
- Mini project: CNC component design & fabrication

5. CERTIFICATIONS (OPTIONAL BUT VALUABLE)

- Six Sigma (Green Belt/Black Belt)
- NDT Level II
- GD&T Certification
- CNC Programming Certificate
- Additive Manufacturing Specialist

1. STRENGTHENING CORE FUNDAMENTALS

Core Mechanical Engineering Courses:

- Engineering Mechanics
- Engineering Thermodynamics
- Applied Thermodynamics
- Thermal Engineering
- Fluid Mechanics
- Heat & Mass Transfer
- Refrigeration and Air Conditioning
- Gas Dynamics and Jet Propulsion
- Energy Systems

2. MASTERING DESIGN AND ANALYSIS TOOLS

- Auto CAD
- CATIA
- ANSYS Workbench
- Ansys Fluent

3. GETTING INDUSTRY EXPOSURE

- **Internships:** in HVAC, Aerospace, Automotive, or Energy sectors
- **Skill Development:** CFD tools, Python/MATLAB scripting, data analytics
- **Work on real life case studies:** Experimental learning and numerical Simulation

4. FUTURE SKILLS FOR GROWTH

- Computational Methods
- ICEM [Integrated Computer Engineering and Manufacturing]
- CFD
- Hypermesh
- COMSOL Multiphysics
- MATLAB / Simulink

5. REAL-WORLD APPLICATIONS

- Automotive Aerodynamics
- HVAC and Refrigeration Systems
- Power Plant Optimization
- Renewable Energy Systems
- Aerospace Propulsion and Cooling

6. CAREER OUTLOOK

Job Roles:

- CFD Analyst
- Thermal Systems Engineer
- HVAC Design Engineer
- Energy Systems Consultant
- Oil & Gas / Petrochemical Engineer
- Aerospace Propulsion Engineer
- Nuclear Energy Engineer
- Aerodynamics Engineer
- Nanofluid & Microchannel Research Engineer

1. AFTER B.E. MECHANICAL (MANUFACTURING FOCUS)

JOBS

- Manufacturing/Production Engineer
- Quality/Process Engineer
- CNC/Automation Engineer
- Industrial Safety Engineer
- Supply Chain Analyst

2. AFTER B.E. MECHANICAL (INDUSTRIAL ENGINEERING FOCUS)

JOBS

- Logistics Engineer
- Supply Chain Engineer
- Continuous Improvement Engineer
- Controls Engineer
- Data Analyst
- Operations Analyst
- Demand Planner
- Manufacturing Manager
- Operations Manager
- Production Supervisor
- Supply Chain Manager

3. AFTER B.E. MECHANICAL (DESIGN ENGINEERING FOCUS)

JOBS

- Design Engineer (e.g., Sheet Metal Design, Valve Design)
- Senior Hydraulics Engineer (Design)
- Product Design Engineer
- Motor Design Engineer
- NPD & R&D Manager (Mechanical)
- Mechanical CAD Designer
- Drone Assemble Engineer
- Mechanical & Physical Engineer

4. AFTER B.E. MECHANICAL (THERMAL ENGINEERING FOCUS)

JOBS

- Thermal Engineer
- CFD Engineer
- HVAC Engineer
- Simulation and Testing Engineer
- Project Engineer
- Sales Engineer

5. HIGHER STUDIES

- **M.S. (Master of Science)** – Pursue research-based studies in India or abroad.
- **MBA** – Transition into management, operations, or project management roles.
- **M.S. in Robotics / Mechatronics / Automotive / Aerospace Engineering** – For advanced technology and interdisciplinary domains.
- **M.S. in Industrial Engineering / Supply Chain / Production Management** – Blend engineering with optimization and management.
- **M.Tech in Energy Systems / Renewable Energy / Thermal Engineering** – Focus on sustainable and power systems.
- **Postgraduate Diplomas / PGDM** – Short-term professional courses in design, manufacturing, or management.
- **M.S. by Research / Ph.D.** – For those inclined toward teaching or advanced R&D.

“All the content given above is not limited”

TESTIMONIALS

I, Infant Maria Rosario V, a final-year Mechanical Engineering student at Kumaraguru College of Technology, am grateful for being placed at Brakes India Pvt Ltd. This milestone reflects the strong academic foundation, practical exposure, and continuous encouragement provided by my and its dedicated faculty members. I sincerely thank the Head of the Department and all faculty members for their mentorship and support throughout my academic journey. I also acknowledge the placement and training team for their effective training programs that enhanced my confidence and preparedness. This achievement stands as a testament to the quality education, values, and discipline imparted by Kumaraguru College of Technology.



Infant Maria Rosario V

I express my sincere gratitude to the faculty members for their constant support and guidance throughout my academic journey. From my second year onwards, the department played a vital role in strengthening my academic foundation and preparing me for placements through structured, industry-oriented training. The faculty members' approachability, mentorship, and emphasis on both theoretical and practical learning greatly enhanced my technical, communication, and aptitude skills. Their continuous motivation, project guidance, and constructive feedback contributed significantly to my professional growth. With the department's dedicated support, I was successfully placed in three reputed companies—Capgemini, Brakes India, and Wakefit. I remain proud to be a student of this department and will carry forward the confidence, discipline, and values it has instilled in me.



Vigneshraja K S

I express my sincere gratitude to the department for providing a strong academic foundation and an enriching learning environment through a structured curriculum and practical learning approach. I am especially thankful to the Head of the Department and all faculty members for their continuous encouragement, leadership, mentorship, and support throughout my course of study. I also acknowledge the placement and training team for their dedicated efforts in organizing training programs, workshops, and placement activities that enhanced my confidence and professional readiness. Securing placement at Capgemini stands as a reflection of the quality education, values, and guidance imparted by the institution.



Melavasal Pandian



I, Kesavdarshan M (22BME048), a final-year Mechanical Engineering student at Kumaraguru College of Technology, am honored to be placed at Hawle India in the Research and Development – New Product Development role. This milestone reflects the strong academic foundation and professional values imparted by the Department of Mechanical Engineering. I sincerely thank the Head of the Department, my Class Advisor, Mentor, faculty members and Project Guide for their continuous encouragement and technical guidance. Their mentorship helped me secure multiple offers from PlanysTech, Makino, and Rane Madras – Engine Component Division before choosing Hawle India. I also appreciate the placement and training team for their focused preparation through technical training and mock interviews. I look forward to contributing meaningfully to my R&D career.

Kesavdarshan

I am Kamalikka V, a final-year Mechanical Engineering student, and I'm grateful for how my department and KCT Garage shaped my technical skills and professional growth. The department's industry-aligned curriculum and practical training helped me build a strong foundation and secure my placement at Blue Star Pvt. Ltd. as early as my 6th semester. KCT Garage played a key role in developing my hands-on skills and leadership—from serving as Vice Captain of Zeall Racing to leading operations for Team Sea Sakthi, the only Indian team at the Monaco Energy Boat Challenge. These experiences gave me real engineering exposure and strengthened my ability to work in high-performance team environments. I sincerely thank all the faculty members and the Placement Cell for their continuous support and guidance. I'm truly grateful to the Mechanical Engineering Department and KCT Garage for empowering me to achieve my career goals early.



Kamalikka V



I sincerely express my gratitude to the Department of Mechanical Engineering and Kumaraguru College of Technology for shaping me into the engineer I am today. The rigorous academic training, along with structured programs in SolidWorks and ANSYS Static Structural Analysis, strengthened my design, analysis, and manufacturing skills. I had the privilege of working on impactful projects, including the DRDO-funded Flexible Nozzle Wind Tunnel and the redesign of the base plate of a mortar. The placement training and the continuous support of the Mechanical Engineering faculty helped me secure a Graduate Engineer Trainee position at Tata Advanced Systems Limited. Joining a leading organization in composites, aerospace structures, and defence manufacturing aligns with my aspiration to contribute to national defence. I remain deeply thankful to my department and institution for empowering me with the skills and confidence to pursue this purpose.

Avinash Ramanathan L

My journey at Kumaraguru College of Technology in the Department of Mechanical Engineering laid a strong foundation for my academic and professional growth. Consistent academic performance earned me the Mahatma Gandhi Merit Scholarship for three consecutive years (2022–2024), motivating me to continuously excel. Engaging in technically challenging projects—from agricultural machinery development to thermal systems analysis and advanced CFD-based research—strengthened my analytical, simulation, and problem-solving skills. Beyond academics, the supportive faculty members and collaborative environment nurtured my critical thinking, teamwork, and communication abilities. Today, as I pursue a Master’s in Supply Chain and Logistics Management at RMIT University, Australia, the strong engineering and systems-thinking foundation from KCT has helped me adapt seamlessly to an international academic setting. I remain proud to be an alumnus and grateful to the Department of Mechanical Engineering for shaping my journey.



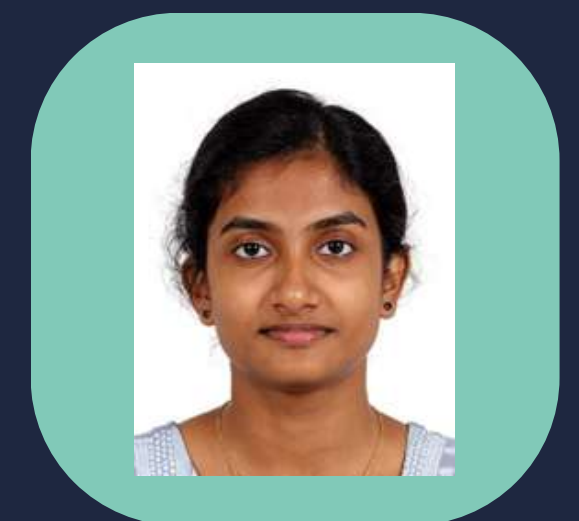
Srinith Kumar Prakash

I am Naveen Murugesh T, a final-year Mechanical Engineering student, and I am grateful to my department and the college garage for shaping my technical abilities and early professional growth. The department’s industry-aligned curriculum and strong focus on practical learning built my core mechanical engineering foundation and helped me secure early placement. The college garage played an equally transformative role by giving me hands-on exposure, teamwork experience, and real engineering challenges. This prepared me to earn my first placement as a Race Engineer in the E1 Series with Team Blue Rising, and through consistent performance, I was later promoted to Race Engineer of Team Monaco—an important milestone in my career. I sincerely thank the faculty members, for their mentorship, guidance, and support in aligning my skills with global industry expectations. I remain deeply thankful to the Department of Mechanical Engineering and the college garage for enabling my professional readiness and helping me progress confidently in my career journey



Naveen Murugesh T

My journey from Kumaraguru College of Technology to Collins Aerospace has been shaped deeply by the institution’s strong learning ecosystem. Winning a national-level design challenge opened the path to Collins, but it was the years of hands-on exposure, responsibility, and guidance at KCT that made it possible. The KCT Garage was a defining experience—where engineering became real, ideas were tested, failures became lessons, and teamwork and execution took center stage. From this environment emerged Team Sea Sakthi, and representing India at the Monaco Energy Boat Challenge was transformative. Competing globally raised our standards and strengthened our confidence. I am equally grateful to my department for fostering a culture of trust, autonomy, and innovation. KCT doesn’t just produce graduates—it shapes engineers who can build, lead, and compete on a global stage. I’m proud to be one of them.



Anjana Prasad



My journey at Kumaraguru College of Technology built the foundation for who I am today. The strong mechanical engineering fundamentals I gained—especially in design and stress analysis—directly support my current role. Leading the Mechanical Engineering Association (AY 2024–25), heading the Workshop Committee during Yugam 2025, and representing the RC Forum at IIT-Madras, Anna University, and PSG Tech shaped my leadership and technical skills. I now work as an Aircraft Structure Engineer at Capgemini, handling live repair cases and performing stress analysis for Airbus structural components. The role demands precision, safety, and timely decision-making—skills strengthened throughout my journey at Kumaraguru. “Kumaraguru prepared me not just to earn a degree, but to deliver impact.”

Sanjay R

My journey as a Mechanical Design Engineer begins today—working on complex robotic systems where precision, endurance, and smart design matter. But the real foundation was built years earlier. I started as a Robotics Systems Engineer, debugging stubborn robots and learning how mechanical, electrical, and software domains merge. Before that, as an intern, I absorbed everything about ROS, simulations, and real-world constraints. And at the very beginning was KCT—where mechanical design became my passion, labs turned theory into motion, and tools like SolidWorks, Fusion, ANSYS, and MATLAB shaped my engineering mindset. Robotics platforms like ROS and Gazebo showed me that engineering is truly interdisciplinary. More importantly, KCT taught me resilience, iteration, leadership, and responsibility. Every step—from student to intern to engineer—was built on that foundation. The story is still unfolding, but its opening scene will always trace back to Kumaraguru College of Technology.

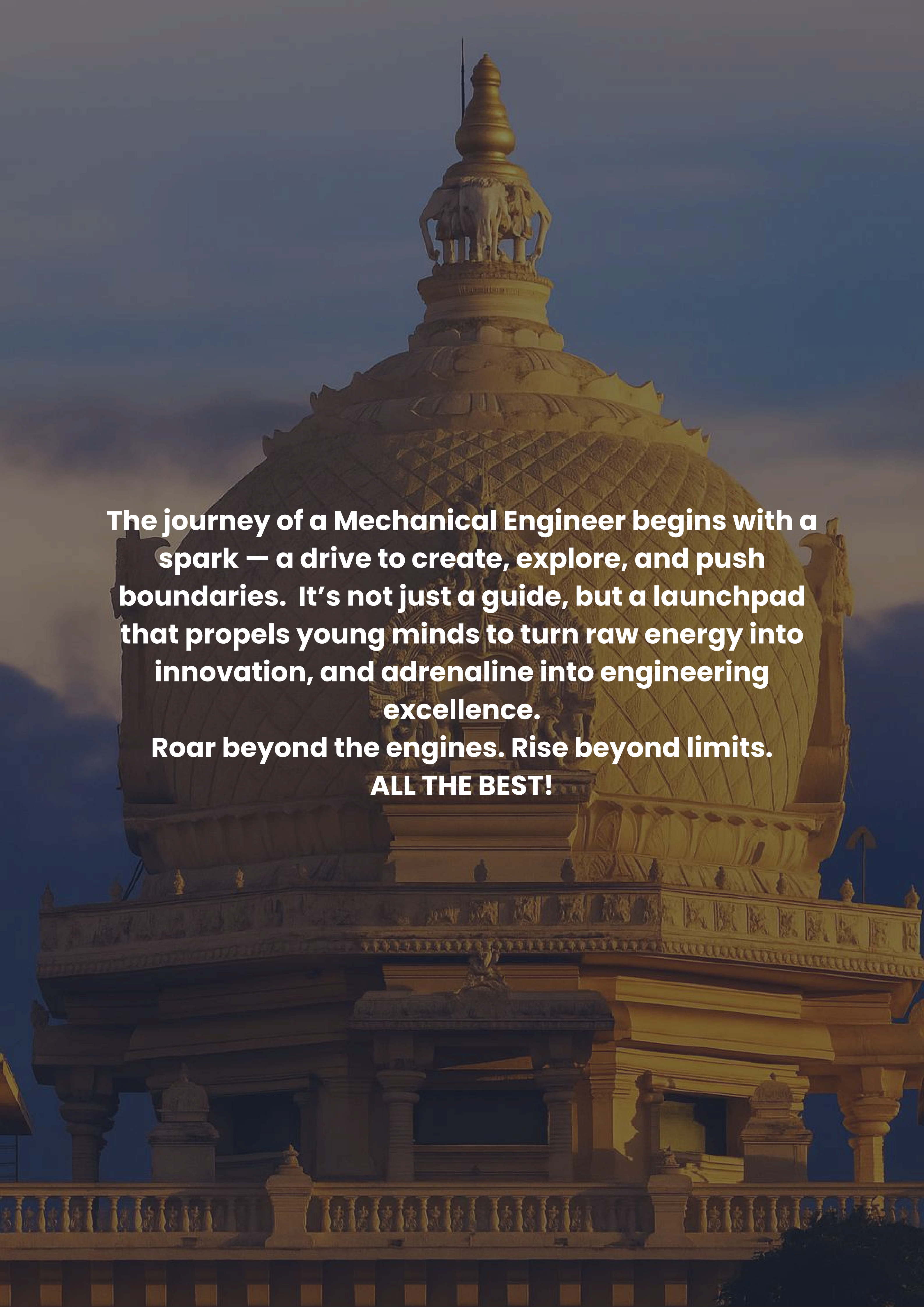


Vaseekaran S L



My Bachelor’s education at Kumaraguru College of Technology (KCT) played a pivotal role in shaping my technical abilities and professional outlook. The strong support from my department—especially during the ProtoSem program—helped me think creatively and solve problems from multiple perspectives. With guidance from the department and K-GEO, I gained valuable international exposure through a block course at the Ara Institute of Canterbury. Internships during my 6th and 7th semesters at KC.IRI strengthened my hands-on skills, and with continued support from K-GEO, I later secured an international internship in the United States. Building on this foundation, I pursued my Master’s at the same U.S. university and worked as a Research Assistant on a NASA-supported project. These milestones reflect the strong academic grounding, mentorship, and global opportunities that KCT enabled throughout my journey.

Vidhun Coimbatore Ramakrishnan



The journey of a Mechanical Engineer begins with a spark — a drive to create, explore, and push boundaries. It's not just a guide, but a launchpad that propels young minds to turn raw energy into innovation, and adrenaline into engineering excellence.

Roar beyond the engines. Rise beyond limits.

ALL THE BEST!