Best Practices: Department of Mechanical Engineering

🧠 **Academic Highlights**

1. Faculty Strength

- **Well-qualified & experienced Faculty:** Comprising faculties with **Doctoral degrees, experts from Industries, and experience in diverse emerging fields.**

- **Central Roles in Research & Development:** Faculty members actively contribute **to Research Journals and Conferences, Patents and IPR. They are members of technical Committees, professional societies, and specialised academic portfolios contributing in state-level academic policy formation and implementation like NEP.** Some Faculty members have been honoured with prestigious research awards and recognitions.

- **Global Outreach & Collaborations:** Members engaged in industry-offered and **industry-relevant projects, policy-making, and Technological advancements with organizations leading to bridging the gap between industries and academia.** Active industry collaboration through consultancy projects and training programs. Cross-disciplinary **collaborative projects connecting multiple engineering fields. The department maintains strong industry partnerships, resulting in excellent internship opportunities with leading companies.**
- **Accredited by NBA peer teams in 3 consecutive cycles from AY 2014 onwards till AY 2026**

- **Departmental faculty strength is as follows**
    - Professor - 01
    - Associate Professors - 03
    - Assistant Professors -17
    - Supporting Staff: 14

2. Student Development Initiatives

Innovative Pedagogical Approaches:

- **Laboratory Projects in Robotics and IoT:**
  Hands-on projects integrating cutting-edge IoT technologies and robotics, preparing students for Industry 4.0 technologies.
- **Student EmployabilityEnhancement Program:**
  Tailored workshops, seminars, sessions from Industry experts, guidance from Alumni and mentoring sessions to strengthen technical skills, critical thinking, and professional aptitude.
- **Career Development Activities:**
  Comprehensive career counselling, AI based Interview software for rehearsal, resume-building sessions, interview preparation, and industry connect programs to prepare students for global opportunities.
- **Comprehensive Viva:**
  Regular evaluations through structured viva sessions enhance articulation, conceptual clarity, and readiness for competitive examinations.

- **Industry Visits:**
  Frequent visits to leading industries expose students to real-world engineering practices and operational excellence.
- **Training and Internships:**
  Structured internships ranging from two weeks to six months, with options for full-year industry immersion, offer practical experience and industry readiness.
- **NSDC-Approved Certificate Courses:**
  Skill enhancement through National Skill Development Corporation (NSDC) recognized certification programs, boosting employability.
- **Credit Transfers and Exchanges:**
  Flexible credit systems enabling students to transfer or exchange credits across universities, enhancing learning diversity.
- **Research Internships:**
  Opportunities for research internships at premier institutes like IITs, NITs, and Technology Business Incubators (TBI), fostering a research mindset.
- **RGSTC-MSME Funded Projects:**
  Active participation in projects funded by Rajiv Gandhi Science and Technology Commission and MSMEs, promoting innovation and entrepreneurship.
- **Hands-on Trainings and Co-teaching by Industry Experts:**
  Experiential learning through intensive training and collaborative teaching sessions by industry leaders and professionals.
- **Technical Competitions and Exhibitions:**
  Active participation in events like *VortechX*, promoting innovation, technical prowess, and peer-to-peer learning.
- **Innovation and Research Projects:**
  Project statements curated to drive innovations leading to Intellectual Property Rights (IPR) filings, patents, conference papers and research publications.
- **Professional Society Engagement:**
  Encouragement to participate in national and international societies such as SAE e-Baja, Robotics and Aviation Club, ISHRAE
- **Cultural and Literary Events:**
  Events like *Impulse* celebrating music, dance, drama, debate, and literature to nurture creativity and self-expression.
- **Leadership and Networking Opportunities:**
  Development of personality and leadership skills through active involvement in student councils, technical clubs, and networking platforms.
- **Community Engagement through NSS:**
  Initiatives under the National Service Scheme (NSS) instil a strong sense of social responsibility and civic duty.
- **Motivation for National Achievements:**
  Focused mentoring and support for students aiming for top ranks in IES, ISRO recruitment, and prestigious national-level technical competitions.
- **Electives from Emerging Domains:**
  Wide choice of program electives from rapidly evolving areas such as Smart Manufacturing, Robotics & AI, Automation, Electric Vehicles, and Supply Chain Management etc.
- **Flexible Academic Framework:**

  Provision for non-grade point credits, floating credits (carry forward credits), and accelerated degree completion options for high-achieving students.

- **Honors and Minor Programs with MOOC/SWAYAM Credit Transfer:** Students can pursue Honors or Minor specializations by transferring credits from recognized online platforms, further expanding their academic horizon.

3. Cutting-Edge Research Facilities

The Mechanical Engineering Department at the School **of Engineering Sciences at Ramdeobaba University (RBU)** is a dynamic hub of innovation, where cutting-edge research and global academic engagement drive real-world impact. Our faculty and students actively contribute to prestigious international conferences and high-impact journals, setting benchmarks across emerging domains such as **Mechanical Engineering, Artificial Intelligence, Advanced Materials**, and **Cyber-Physical Systems**.

Research Ecosystem

- **Collaborations** with premier national institutes like VNIT Nagpur, NIT Rourkela, MANIT Bhopal, NIT Silchar, SVNIT Surat, Chitkara University, and active participation on international IEEE platforms.
- **Strategic Focus Areas** include Robotics, Automation, Smart Manufacturing, Renewable Energy Systems, Sustainable Manufacturing, Cybersecurity in IoT networks and AI-driven Agricultural Automation for advanced healthcare solutions.
- **State-of-the-art Access** to Robotic automation setups, FEA & CFD Simulation, advanced material characterization tools, HVAC simulation systems, and AI computation facilities.
- **Vibrant Research Culture** with regular contributions to Scopus/SCI-indexed journals and IEEE conference proceedings.
- **14 MoUs with leading industries and premier institutes** to promote collaborative learning, joint research projects, internships, and technology transfer.
- Direct mentorship and training opportunities under the guidance of **industry experts** and **subject matter specialists**.

Key Achievements

- **Biennial Technical event VortechX** promoting research, innovation and entrepreneurship.
- **Major Research Engagements**: International Conferences organized like ICRDME-22, ICACER-2019, Government-funded initiatives (RGSTC-TIFAC-MSME).
- **Impressive Research Output**: 68+ Patents Granted, 25+ Filed, 50+ SCI Publications, 142+ Scopus Papers, and 5 Books Published.
- **Infrastructure Excellence**: 16 specialized labs in Mechanical Engineering, Robotics, AI, Automation, and Smart Manufacturing; ICT enabled classrooms; a Centre of Excellence in Industry 4.0.

🏢 **State of Art Infrastructure & Centres of Excellence**

- **RCOEM-TATA Centre for Invention Innovation Incubation and Training (CIIIT)** – A w**orld-class infrastructure developed in collaboration with TATA**

Technologies—valued at ₹23 Crores that provides hands-on experience with industry-grade tools and technologies.

- Modern research laboratories, a NABL-accredited laboratory, and a dedicated Ph.D. Research Centre support advanced studies and foster innovation in engineering.
- **14+ Live MoUs with Leading Industries & Institutes for collaborative learning.**
- **Advanced 16+ laboratories well-equipped with modern machines and high-end professional software.**

CIIIT Infrastructure and Centres of Excellence catering to Industry 4.0 Technologies includes

1. Innovation Design Incubation Centre

- Equipped with world-renowned professional software suites in **CAD, CAM, FEA, CAE, CFD**, and **MBD**.
- Access to advanced tools including **MSC Nastran**, **MSC Patran**, **Adams Machinery Studio**, **Dassault Systèmes 3DEXPERIENCE**, **CATIA V6 PLM**, **Delmia**, **Marc**, **Easy5**, **ScFLOW**, and **FEAST by ISRO**.
- Focus areas: **Product design**, **virtual simulation**, **Finite Element Analysis**, and **Multi-Body Dynamics**, CFD.

2. Integrated Advanced Manufacturing Centre

- Cutting-edge manufacturing equipment including **Arc-Welding Robots**, **Pick-and-Place Robots**, **Vertical Machining Centers (VMC)**, and **3D Printers and Scanners, Laser cutting etc**.
- Deployment of **Factory Magix Manufacturing Execution System (MES)** to offer real-time shop-floor monitoring and process optimization.
- Training in **Industry 4.0 technologies**, **automation**, and **smart manufacturing systems**.

3. Machine Learning & IoT Centre

- Hands-on R&D on **IoT, Machine Learning, and Smart Systems** using integrated IoT controller boards (ESP32, Arduino Nano, Raspberry Pi) and sensor networks.
- Applications in **home automation**, **precision agriculture**, **healthcare technologies**, **e-mobility**, and **smart retail**.
- Access to the **i-Get-It e-learning platform** for specialized training in emerging technology domains.

Special Features of Mechanical Engineering Department, RBU Nagpur

Academic Excellence & Industry-Oriented Curriculum

- **Industry-oriented curriculum designed to create industry-ready professionals.**
- **Interdisciplinary curriculum integrating mechanical, automation, and smart manufacturing domains.**
- **Core engineering concepts blended with cutting-edge technologies.**
- **Operations research techniques for optimizing industrial processes.**
- **Professional development programs for holistic career growth.**

State-of-the-Art Infrastructure & Facilities

- **World-class infrastructure developed in collaboration with TATA Technologies.**
- **Advanced laboratories equipped with high-end software and sophisticated machines.**
- **Smart manufacturing labs to train students in Industry 4.0 technologies.**
- **Hands-on training in Robotics & Artificial Intelligence for future-ready engineers.**
- **Automation and manufacturing labs with CNC machines and rapid prototyping tools.**

Skill Development, Participative and experiential Learning

- **Skill-based training in Robotics, AI, and Smart Manufacturing.**
- **Project-based learning approach to enhance problem-solving skills.**
- **Emphasis on practical exposure through live industrial projects.**
- **Workshops and industrial visits to bridge the gap between academia and industry.**
- **Hands-on learning modules SAE collegiate club- Trident Racing, Robotics and Aviation Club (RAC)**
- **SAE Collegiate Club participation, providing opportunities for national-level competitions.**
- **Active involvement in Trident Racing Club, specializing in electric all-terrain vehicles**.

Internships, Placements & Career Support

- **Provision for one-year internships in reputed engineering industries.**
- **Excellent placement opportunities in the Mechanical and Manufacturing industries.**
- **Strong industry collaborations ensuring real-world exposure and job readiness.**
- **Alumni mentorship programs for career guidance and professional growth.**
- **Training for competitive exams (GATE, GRE, UPSC Engineering Services, etc.).**

Global Exposure & Holistic Development

- **Industry immersion programs** through corporate tie-ups and live projects.
- **Ethics and sustainability education** for responsible engineering practices.
- **Student exchange programs** and collaborations with international universities.
- **Participation in national and international technical competitions** like E-Baja by SAE INDIA.
- **A transformative learning experience** where theory meets practice, and innovation knows no bounds.

 Student Support & Activities: (with pictures)

Technical Clubs and Societies: At School of Engineering Sciences, there are several vibrant and most happening forums like Civil Engineering Students Association (CESA), SAE Collegiate club - Trident Racing, Robotics and Aviation Club (RAC), Indian Society of Heating Refrigeration and Air Conditioning (SHRAE) and MECHASSO. Students have ample opportunities to explore their passions, build hands-on projects and collaborate with like-minded peers. These clubs not only foster technical skills but also ignite leadership and teamwork, ensuring you're ready to face the challenges of tomorrow.

Technical and cultural Fests and Competitions: The School hosts exhilarating technical and cultural fests and competitions throughout the year, where the brightest minds come together to showcase their expertise and innovative solutions. From the high-stakes CAD War and Elevate challenges to precision-driven robotics competitions, students engage in a diverse array of technical and creative pursuits. Whether it's designing, fabricating, and assembling robot parts, mastering coding, or participating in IMPULSE forum activities, these experiences provide the perfect blend of hands-on learning and innovation. Beyond academics, vibrant dance performances and exhilarating gala nights foster a dynamic and competitive culture, ensuring that students push their limits while enjoying every moment of their journey.

Release of Proceedings of International Conference ICRDME at the auspicious hands of Director La Foundation Dassault Systems, Pune, Shri Hemant Gadgil

First Prize at Technoxian World Cup- 2023 IIT Delhi – RC Aircraft

SAE Trident Racing - RCOEM SAE Club secured All India Rank (AIR) 3 in the Virtual Costing Event and AIR 3 in the Innovation Event, out of 110 participating teams. Director La Foundation Dassault Systems Mr Hsalim Huzefa

Impulse 2025 – Cultural Event (Bhajan Sandhya)

Student testimonials or success stories

Saurav Khanna, AGM at Maruti Suzuki, Ex-TATA Motors

I still remember the excitement and anticipation of stepping into the RCOEM campus. The vibrant energy, the collaborative peers and supportive faculty, and the drive for innovation made it a place where ideas turned into reality. My time at RCOEM laid a strong foundation for my career, providing not just technical knowledge but also the confidence to take on real-world engineering challenges. The Mechanical Engineering program at RCOEM was instrumental in shaping my journey, blending core engineering principles with hands-on

experience. The curriculum constantly evolved to keep pace with industry advancements, ensuring students were well-equipped for the future. Whether it was working on design projects, learning advanced software like CATIA and executing Industry defined project on LDMS for College connect program of Dassault Systems contributed to my growth.

Today, as a Design Engineer at Tata Motors ERC, I apply the same problem-solving mindset and technical expertise that I honed during my college years. RCOEM is more than just an institution—it is a thriving ecosystem of learning, innovation, and lifelong connections. If you are looking for a place that nurtures curiosity, fosters excellence, and prepares you for the industry's ever-evolving demands, ME, RCOEM is the perfect choice. I am proud to be an alumnus of this esteemed institution and will always be grateful for the knowledge, opportunities, and friendships it has given me.

Swarali Wadatkar, Associate Engineer- Mechanical
Eaton India Innovation Centre (EIIC), Proud RCOEM Alumna, 2021-2024

"My journey at RCOEM, Nagpur has been truly transformative. The institute provided me with a strong technical foundation, hands-on learning experiences, and invaluable industry exposure. The supportive faculty and dynamic learning environment played a crucial role in shaping my skills and confidence. RCOEM not only prepared me for professional challenges but also nurtured my growth as an engineer and a leader. I am proud to be an RCOEM alumna and grateful for the opportunities it has given me!"

Pooja Shende, Pursuing Toy & Game Design, M.Des (Master of Design)

Pooja Shende is a dedicated Design Engineer at Tata Motors ERC, specializing in Interior Trims Development for cutting-edge projects like Avinya, Sierra, Nexon, and Curvv. With a strong foundation in mechanical design and product development, she collaborates with cross-functional teams (CFTs) to drive innovation in soft and hard interior trims. Her expertise in CATIA V6/V5 and Creo enables her to bring creative, functional, and high-quality designs to life. Additionally, her minor in Computer Science has equipped her with Python programming, algorithm design, and data analysis skills, enhancing her problem-solving approach. Through her academic journey, hands-on projects, and industry experience, Pooja has developed a keen eye for detail, strong project management abilities, and a relentless drive for excellence. Passionate about innovation and design, she continues to push the boundaries of automotive engineering, contributing to the future of mobility with Tata Motors

Student Testimonials for the Mechanical Engineering Department

Rashmi Kishor Dixit, RCOEM, B.E. Mechanical Engineering (MEU), 2013-2017

"The Mechanical Engineering department at Ramdeobaba University provides a perfect mix of theoretical knowledge and hands-on experience. The faculty is highly supportive, and the labs are well-equipped with modern technology. Industry collaborations and workshops

helped me gain practical skills, making me job-ready."

Shikhar Chakravorty, K12 Techno Services Pvt. Ltd., Manager - Trade Marketing, RCOEM,
B.E. Mechanical Engineering (MEU), 2016-2020

"Studying Mechanical Engineering here was a great experience, with excellent faculty, advanced labs, and industry exposure. The internships and technical competitions boosted my confidence and skills. Thanks to strong placement support, I secured a job in a top company."