Name of CoE/Centre: Centre of Excellence in e-Mobility

About the Centre

The Centre of Excellence in e- Mobility at Christ University- Kengeri campus plays a critical role in shaping the future of transportation and addressing global challenges related to sustainability and energy efficiency. This centre focuses on cutting-edge research and development in key areas of Energy Storage Systems, Advanced Powertrain Technologies, Software-Driven Vehicles, and Sustainable Transportation.

Vision

CoE in e-Mobility is a globally recognized innovation hub driving the future of sustainable mobility. We collaborate with industry to deliver cost-effective, cutting-edge solutions that enhance competitiveness and accelerate the transition to clean, efficient, and intelligent transportation systems.

Mission

Create and sustain a value-driven collaboration between academia, industry, and researchers, driving innovation and knowledge-sharing to shape the future of sustainable transportation.

Objectives

- Develop innovative solutions, proof of concepts, and advanced subsystems in future mobility.
- Deliver industry-aligned training in Electric Vehicle technologies through strategic collaborations.
- Offer comprehensive vocational, skill development, and blended learning programs in e-mobility for students, researchers, and professionals.
- Provide consultancy services to e-mobility companies and actively engage in product development.
- Foster and promote start-ups in the future mobility ecosystem.

Departments Associated:

- Electrical & Electronics Engineering
- Electronics & Communication Engineering
- Mechanical & Automobile Engineering
- Computer Science & Engineering

Facilities Available:

- Glove Boxes: For handling moisture- and oxygen-sensitive materials during electrode and electrolyte preparation.
- Crimping Unit: For the assembly of coin and pouch cells.
- Electrochemical Workstation: Supporting cyclic voltammetry, impedance spectroscopy, and cell characterization.
- X-ray Diffraction (XRD) and Scanning Electron Microscopy (SEM): For structural and morphological analysis of materials.
- Thermal Chamber (-20°C to 70°C): Enabling performance testing under varying temperature conditions.
- Cell and Pack Test Benches (ACIR/DCIR): For resistance measurement and pack-level testing.
- Cell Digital Twinning Capability: Simulating performance across different operational scenarios.
- Battery Management & Thermal Management Development Facility: To optimize energy systems for electric mobility applications.
- E-2 Wheeler Dynamometer: For testing and validation on vehicle drive cycles.

Research Areas:

Energy Storage Systems

- Material Synthesis and Characterization
- Coin Cell Fabrication and Testing
- Cell Characterization and Digital Twinning
- Battery Pack Assembly with BMS and TMS Integration
- Performance Testing on Electric Two-Wheelers

Software Defined Vehicles

- Precision Farming with Drones
- Smart Sensors and Environment Perception
- Navigation and Obstacle Avoidance
- Mission and Path Planning

- Autonomous Systems Motion Control
- Digital Twinning of Autonomous Systems
- Predictive Maintenance in Autonomous Systems

Sustainable EV Technologies

- Sustainable Energy Integration for EV Charging
- On Board Converters
- Advanced Motor Drives
- Resonant Converters
- E-2W Design & Development
- Last Mile Connectivity Models

Collaborations:

Industry :

Decibels Lab Pvt. Ltd

A-Thon

Safran Engineering Services

Mahindra Electric

Academic :

Binghamton University, USA

Consultancy and Research Projects Undertaken:

Area	**Key Deliverables**
Energy Storage Systems	Battery pack design, management system specifications, optimization reports
Advanced Powertrain Technologies	Powertrain design specifications, performance analysis, integration guidelines
Software-Defined Vehicles	Software architecture plans, system integration strategies, testing protocols
Sustainable Transportation Solutions	Sustainability reports, efficiency improvement plans, policy recommendations

Charging Infrastructure	Charging station design, implementation roadmaps, standards compliance guidelines
Regulatory Compliance	Compliance reports, regulatory strategy documents, certification support
Training and Capacity Building	Training modules, workshop schedules, certification
Start-up Incubation	Business plans, mentorship sessions, funding guidance, resource allocation
Project Feasibility Analysis	Feasibility reports, risk assessments, cost-benefit analyses

Programmes and Certification Courses Offered:

- Post Graduate Diploma in Electric Vehicle Technology
- M.Tech in Electric Vehicle Technology
- Industry Certification Programs

Student Internships:

- Certification programs
- Summer Intership program for UG/PG/Ph.D students
- Summer Internship program for School students

Major Achievements:

Journal Publications : 15 Scopus Indexed papers

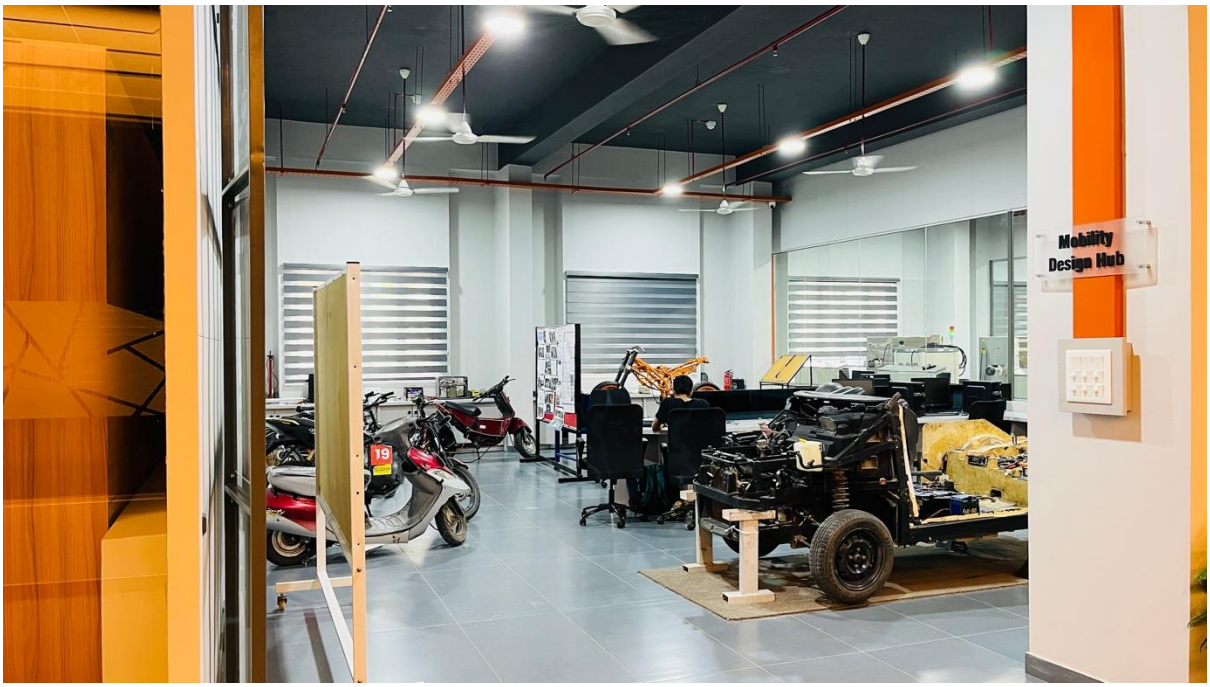
Conference Publications : 12 Student Publications

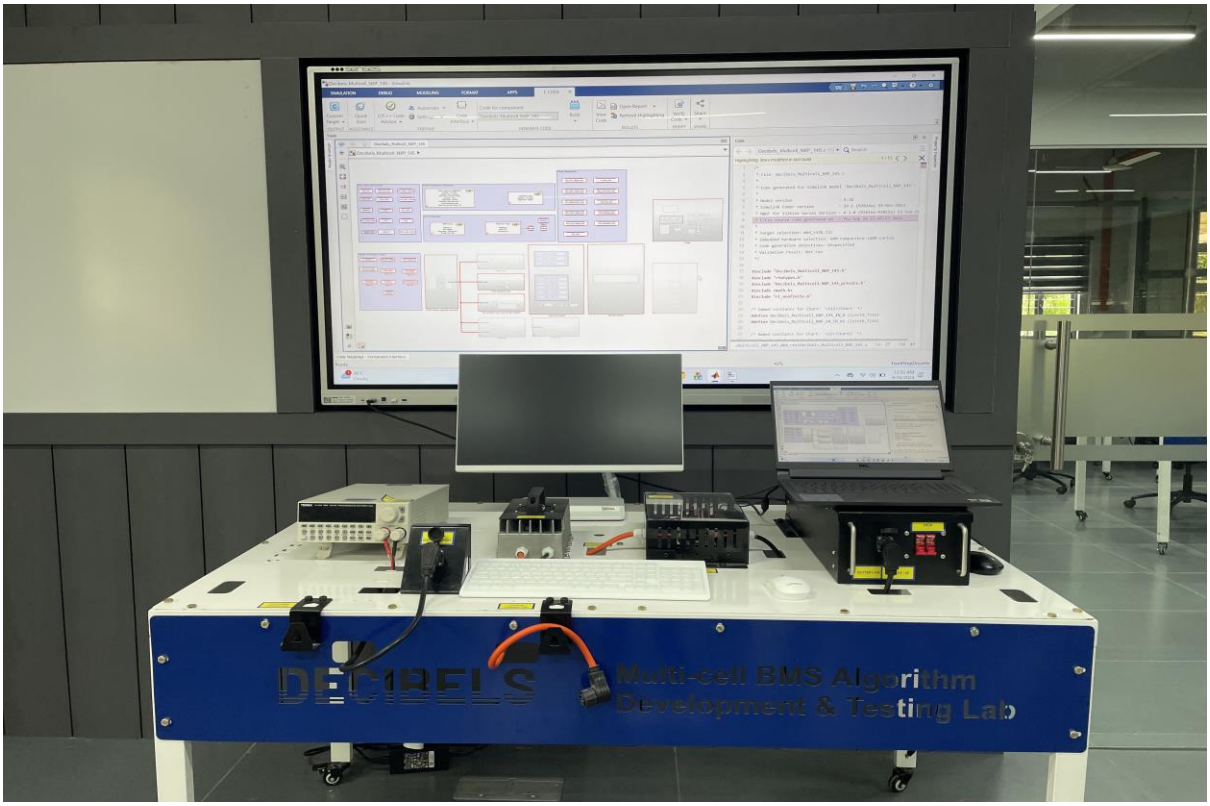
Industry based Live projects : 7 projects based on industry problem statements currently being undertaken by faculty groups and students

Placements: 13 student placements from the CoE in e-Mobility team in core automotive industries.

Higher Studies: 10 students from the CoE in e-Mobility team are currently completing higher studies in automotive domain.

Images:


Mobility
Design Hub


Multi-cell BMS Algorithm
Development & Testing Lab


ENVIRONMENTAL
CHAMBER
DECIBELS