

Department of Electrical and Electronics Engineering

1. About the Department:

The Department of Electrical and Electronics Engineering (EEE) focuses on cutting-edge education and research in Electrical Machines, Power Systems, Renewable Energy, Embedded Systems, Digital energy and AI-driven Energy Management. Equipped with advanced laboratories and an industry-relevant curriculum, the department prepares students for real-world challenges and innovation.

The department has won the "Best Industry Linked Technical Institute (Electrical Engineering and Allied) Award 2020" the AICTE CII survey. The EEE department collaborates with leading industries through MoUs and partnerships, including EKKI Pumps, CRI Pumps, Power Projects, V-Guard Industries, Fortec Electric India and Swelect enabling internships, skill development, and joint research in energy and automation technologies.

Key focus areas include:

- Renewable Energy Systems
- Smart Grids and Microgrids
- AI and IoT in Energy Management
- Power Electronics and Drives
- Embedded Systems and Control
- Electric Vehicles and Battery Management Systems

These areas align with industry demands and national priorities, driving innovation and sustainable development.

2. Facilities Available for Industry Collaboration

EKKI Lab: The EKKI Lab is a state-of-the-art facility focused on advanced research in water technology and sustainable energy systems. It features cutting-edge equipment to support innovation and skill development.

Power Quality Analyzer: Equipped with a high-precision Power Quality Analyzer, the lab facilitates real-time monitoring and analysis of electrical parameters, ensuring optimized energy performance and grid reliability.

JMAG Software: The electrical machines lab integrates JMAG Software, a powerful simulation tool for electromagnetic design and analysis, enabling advanced research in motor design and energy-efficient devices.

dSPACE: With dSPACE systems, the control system lab supports real-time hardware-in-the-loop (HIL) simulations and rapid prototyping, crucial for developing intelligent control systems and automation technologies.

ETAP: The lab is equipped with ETAP, enabling comprehensive design, analysis, and optimization of power systems and smart grids.

3. Consultancy Services

The EEE Department offers consultancy in:

- **Power Systems & Renewable Energy:** Grid integration and energy optimization.
- **Smart Grids & Microgrids:** Design and implementation for rural and industrial needs.
- **Power Electronics & Drives:** Customized inverter and motor drive solutions.
- **Embedded Systems & Automation:** IoT-enabled energy and automation solutions.
- **Energy Audits & Management:** Comprehensive audits for cost and energy savings.

Successful projects include energy audits, microgrid development, and IoT-based monitoring systems, supporting industries and communities with innovative solutions.

4. Testing Services

Pump Performance Testing: Comprehensive testing of pumps for efficiency, flow rate, and energy consumption is conducted through the EKKI Pumps Lab, equipped with advanced facilities to ensure precise evaluation and optimization of pump performance.

Power Quality Analyzer: Comprehensive analysis of power quality parameters, including voltage, current, harmonics, and power factor, is conducted using the Power Quality Analyzer. This advanced equipment ensures accurate monitoring, diagnosis, and optimization of electrical systems for improved efficiency and reliability.

5. Executive Development Programs

Pump Performance Optimization and Testing

- **Duration:** 2 weeks
- **Topics:** Efficiency testing, flow rate analysis, energy consumption optimization, and troubleshooting techniques.

Advanced Simulation Tools for Pump Design

- **Duration:** 2 weeks
- **Topics:** Hands-on training with JMAG software, CFD analysis, and system-level design optimization.

6. Research and Development Collaborations

The EEE Department is a recognized research center under Anna University, Chennai with 7 faculty members serving as approved research supervisors. Currently, 10 research scholars are pursuing their Ph.D. under the department. The department actively engages in cutting-edge research to address industry challenges, focusing on key areas such as: Renewable Energy Systems, Smart Grids and Microgrids, Power Electronics and Drives, AI and IoT in Energy Management, Electric Vehicles and Battery Technologies management systems.

Collaboration Opportunities

The EEE Department fosters innovation through industry collaboration in areas like energy, automation, and AI-driven systems. Opportunities include joint research projects, funded initiatives with government and industry, and industry-academia partnerships for technology transfer and consultancy, driving real-world solutions and sustainable advancements.

7. Achievements and Success Stories

Renewable Grid Integration

Successfully designed and simulated a **Renewable Source Grid Integration System** using MATLAB for **ABB Global Industries and Services Ltd., Bangalore**, enabling seamless integration of renewable energy sources into the grid and enhancing operational efficiency.

Energy Audit Excellence

The EEE Department successfully conducted energy audits for prominent organizations, delivering actionable insights to enhance energy efficiency:

- **NTPC, Unit-V, Vidhyachal:** Improved energy utilization in a thermal power plant.
- **V-Guard Industries Ltd., Coimbatore:** Optimized energy consumption in manufacturing processes.
- **M/s Foretec Electric Pvt. Ltd., Coimbatore:** Identified power quality issues and implemented solutions.
- **TATA International Pvt. Ltd. (M/s Jawahar Anand & Co), Chennai:** Reduced energy wastage in industrial operations.