

INSTITUTE OF INFRASTRUCTURE, TECHNOLOGY, RESEARCH AND MANAGEMENT

An Autonomous University established by Government of Gujarat



Department of Electrical and Computer Science Engineering

*Laboratory facilities available for
External Institutions/Organizations*



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About:

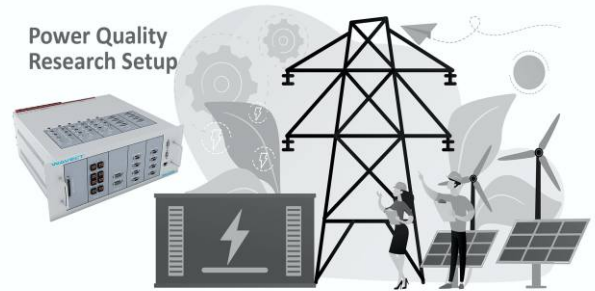
The Electrical and Computer Science Engineering Department at IITRAM offers B.Tech, M.Tech. and PhD programs in Electrical Engineering and B.Tech. and PhD programs in Computer Engineering to cater the need of industries and research organizations. The department imparts a strong theoretical foundation and hands-on training to the students in the domain of Electrical and Computer Engineering. The department currently has 16 faculty members having PhD from premier institutions of India like IITs, NITs, IISc and overseas universities.

The faculty members have specialization in the domains of VLSI, Control Systems, Power Electronics, Power Systems, Communication Systems, Signal Processing, Electrical Machines, Deep learning, IoT, ICT, Image Processing, Drone Technology, Artificial Intelligence, and Edge Computing. The laboratories in the department are equipped with the most modern equipment and computational facilities with the latest tools like MATLAB, ANSYS, Visual TCAD and many open source software. Many faculty members were/are engaged in research and development consultancy for industries and utilities. Some of the prominent ones are Rolls-Roys Singapore, Solidpro Pvt Ltd Chennai, SAC - ISRO Ahmedabad, Aztech Fluids and Machinery Ltd, Goginie Pvt Ltd, Gujarat Cancer Research Institute, etc. The department has strong interaction with industry leaders to understand the future challenges as well as expectations of the industry by organizing Expert talks, Seminars, Colloquium, and Workshops.

Laboratories:

- Power Systems Laboratory
- Communication Systems Laboratory
- Control Systems Laboratory
- Electrical Machines Laboratory
- Electronics Devices & Circuits Laboratory

POWER SYSTEMS LABORATORY



WAVECT High-end FPGA Controller

Functionality:

Rapid Control Prototyping of Electrical Systems

Specifications:

WAVECT (WCU300HD) Controller Box with

- 16 voltage sensors
- 16 Current sensors
- 24 PWM channels
- 2 Encoder channels
- 8 Relay channels
- 16 Analog input/output channels
- WAVECT Suite for measurements and analysis
- Device library for MATLAB/Simulink environment

Charges:

- **For Academic Institutions/Govt. Organizations:** INR. 400/hr
- **For Industry:** INR. 600/hr

COMMUNICATION SYSTEMS LABORATORY



Verify LTE uplink control and traffic channel operations



Quickly locate interfering signals



Detect and difference multiple pulses at the same time



FieldFox Handheld Spectrum Analyzer

- Standard models include cable and antenna analyzer
- Expand capabilities with VNA, spectrum analyzer, built-in power meter, vector voltmeter, and more.
- Save time by measuring DTF and TDR in the same sweep.
- Measure all four S-parameters simultaneously.
- Make accurate spectrum analyzer measurements (± 0.5 dB) without warm-up also calibrate easily with QuickCal
- Use the industry's lightest all-in-one analyzer at only 3.0 kg.

Charges:

For Academic Institutions/ Govt. Organizations:

INR. 4000/ antenna module test

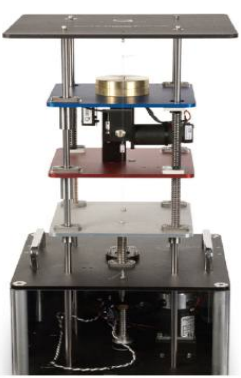
For Industry:

INR. 6000/ antenna module test

All charges mentioned above are excluding GST | Charges may be revised from time to time as per Institute norms

CONTROL SYSTEMS LABORATORY

Active suspension system



Double mass, spring, damper system analysis + Industry-relevant control requirements (ride comfort, suspension travel, road handling) «Derivation of dynamic model -representation + System transfer functions *Open-loop system analysis * Time domain and frequency-domain open-loop and closed-loop system identification + Full-state/two state feedback LQR control design(with real-time control parameter tuning)

Magnetic Levitation Workstation

* Transfer function representation * Linearization FEATURES
Electromagnet made of a solenoid coil and a steel core Pedestal embedded with photo-sensitive position sensor * Solid stainless steel ball Interior lights * Current control * Position control * PID * Feed-forward * Control parameter tuning.



2-DOF Serial Flexible Link Robotic Arm



*Disturbance Rejection + Tracking Control & Regulation + Full-State Feedback * ObserverDesign & Implementation + Frequency Analysis * Lead / Lag Compensation * Vibration &Resonance + System Modeling & Simulation + Root Locus Design + Nyquist Stabilitymeter-0-3.5 m/s
Robotics + Real-Time Control « Discrete Time Sampling.

Coupled Tank System



* Derivation of dynamic model from first-principles CURRICULUM TOPICS PROVIDED + Transfer function representation -Linearization + Level control PID -Feed-forward * Two tanks and single pump design °Control parameter tuning.

Charges:

**For Academic institutions/
Govt. Organizations:**

INR. 1000/hr, for demo,
INR. 5000/ experimental work,
INR. 10000 for validation of algorithm

For Industry:

INR. 25000 consolidated

All charges mentioned above are excluding GST | Charges may be revised from time to time as per Institute norms

ELECTRICAL MACHINES LABORATORY

SFRA Test Kit (PDIC PFRS-25)



- Detailed Specs: <https://shorturl.at/hoFMO>
- Diagnose transformer's mechanical integrity by analyzing its frequency response.
- Capture transfer function over wide frequency range from 0.1Hz to 25MHz.

Academic/Govt. Institutions: INR. 500/hr
Industry: INR. 750/hr

Transformer Windings 1 MVA 11/6.6 KV Disc Winding (LV and HV)



- Set up for isolated winding, 1-Ph or 3-Ph transformer on wooden core with disc winding.
- Provision of tappings to collect voltage data.
- Provision for including axial and radial deformations.

Academic/Govt. Institutions: INR. 500/hr
Industry: INR. 750/hr

Single Phase Transformer Turns Ratio Meter



Mechanical Integrity verification, research purpose, test and calibration purpose

Academic/Govt. Institutions: INR. 200/hr
Industry: INR. 300/hr

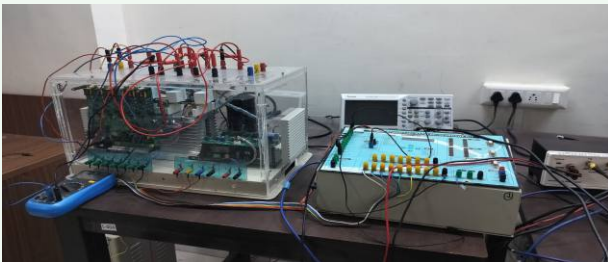
Control Panels for various Electrical Machines



Control Panels for Induction Motors, Transformers, Synchronous Motors, DC Motors

Academic/Govt. Institutions: INR. 300/hr
Industry: INR. 500/hr

PMSM Control setup



10 kVA 3/4-leg converter with STM-32 controller for real-time control of PMSM .

Academic/Govt. Institutions: INR. 500/hr
Industry: INR. 750/hr

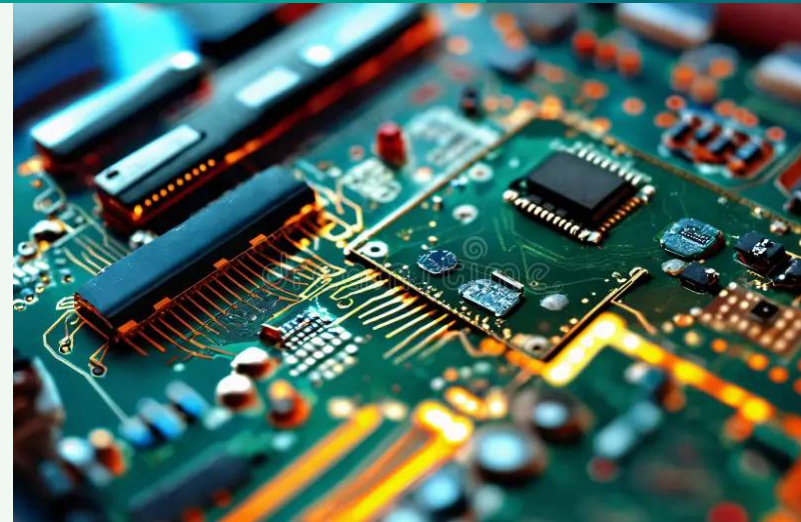
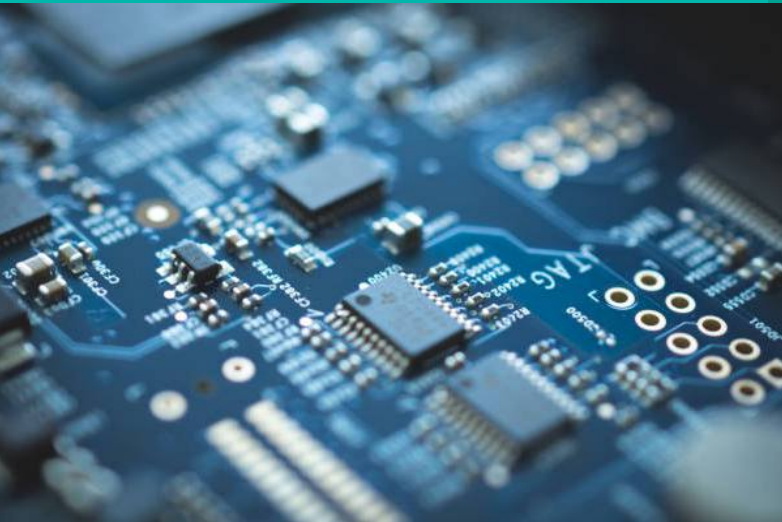
High bandwidth AC Current Probe (Tektronix P6021A)



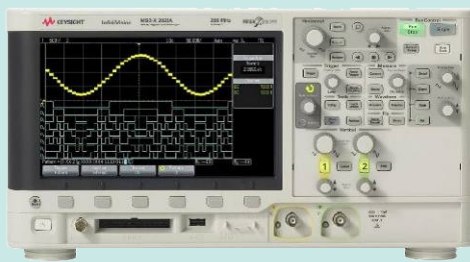
Current measurements for wide-band performance characteristics 120 Hz to 60 MHz with excellent low-frequency sensitivity of 2mA/mV and 10 mA/mV switchable options.

Academic/Govt. Institutions: INR. 500/hr
Industry: INR. 750/hr

ELECTRONICS DEVICES AND CIRCUITS LABORATORY



Digital Storage Oscilloscope



DSO is an instrument used to display and analyze electronic signals. It draws waveforms or a graph of an instantaneous signal voltage against time.

Charges:

Academic/Govt. Institutions: INR. 1000/hr

Industry: INR. 2000/hr

Function Generator



A function generator is a piece of electronic test instrument used to generate and deliver standard waveforms, typically sine and square waves, to a device under test.

Charges:

Academic/Govt. Institutions: INR. 1000/hr

Industry: INR. 2000/hr

DC Power Supply



A DC power supply provides direct current (DC) voltage to power and test a device under test such as a circuit board or electronic product.

Charges:

Academic/Govt. Institutions: INR. 750/hr

Industry: INR. 1500/hr

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