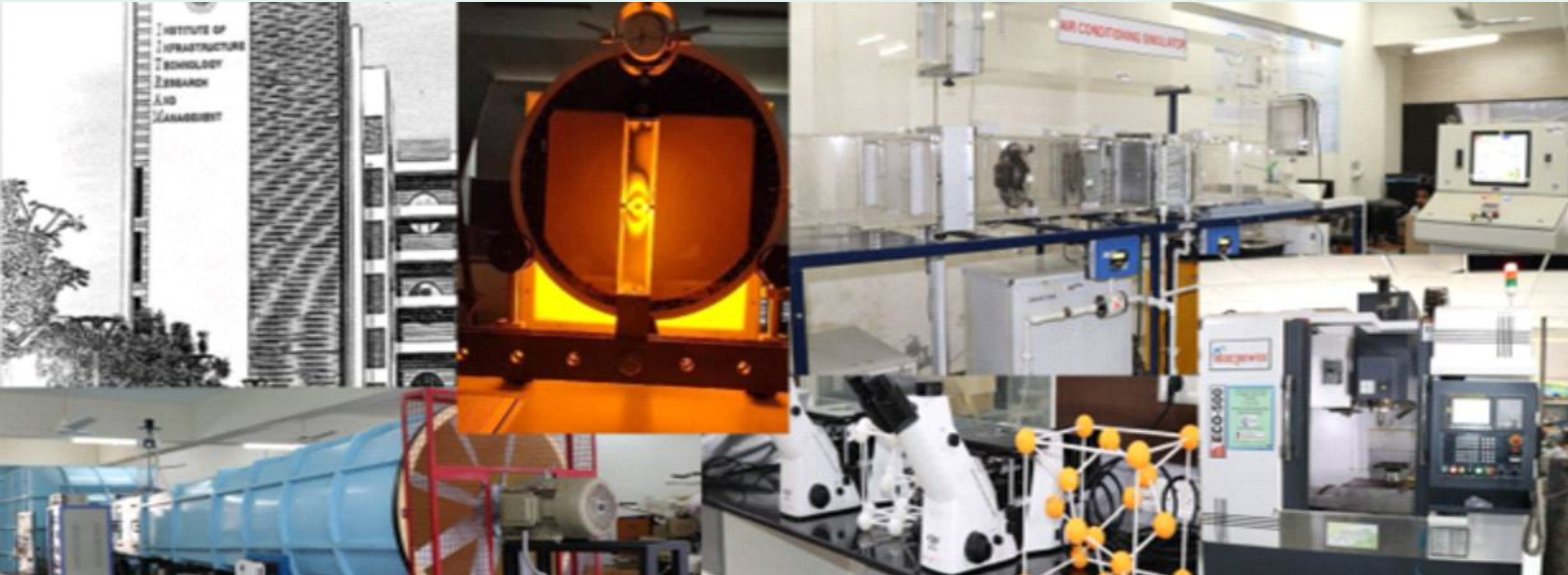




INSTITUTE OF INFRASTRUCTURE, TECHNOLOGY, RESEARCH AND MANAGEMENT

An Autonomous University established by Government of Gujarat



Department of Mechanical and Aerospace Engineering

*Laboratory facilities available for
External Institutions/Organizations*



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About:

Mechanical engineers drive infrastructure development across critical sectors, including power generation, manufacturing, and industrial refrigeration. With India's rapid economic expansion and the rising societal demand for energy and manufactured goods, there is an increasing need for mechanical engineering graduates proficient in advanced technologies and contemporary practices. To address this demand the Department of Mechanical Engineering at IITRAM offers a comprehensive B.Tech. to address this demand. program in Mechanical Engineering and a specialized postgraduate pathway leading to M. Tech. degree in Mechanical Engineering (Specialization in Industrial Infrastructure) and Ph.D. in various cutting-edge research areas of Mechanical and Aerospace Engineering. These programs are complemented by additional academic enrichment options, including Honors in Mechanical Engineering, Minors in Drone Technology, Micro-specializations in cutting-edge fields such as Nanotechnology, Robotics and Human Interaction, Industrial Safety etc. The curriculum builds upon a strong foundation in traditional Mechanical Engineering while incorporating modern advancements tailored to industrial infrastructure. With an emphasis on infrastructure development and management, aligned with the institute's strategic goals, the program equips students to pursue diverse career paths.

Laboratories:

- Advanced Refrigeration and Air Conditioning Laboratory
- Central Workshop Facility
- Aerodynamics And Propulsion Laboratory
- Internal Combustion Engine Laboratory
- Heat And Mass Transfer Laboratory
- State Of Arts Facilities Robotics and Automation Laboratory
- Theory Of Machines And Mechanisms Laboratory
- Fluid Machinery Laboratory
- Advanced Manufacturing Processes Laboratory

ADVANCED REFRIGERATION AND AIR CONDITIONING LABORATORY



Equipments:

- Computerized Air Conditioning Setup.
- Computerized Cold Storage Setup.
- Cold room for precooling storage and ripping and ducting facility.
- Vapour Compression Test Rig.
- Heat Pump Test Rig.
- Ice Plant Test Rig.
- Tool Kit and Training Setup.

Features:

- Access to Advanced Equipment for Refrigeration and Air Conditioning.
- Comprehensive Testing and Research Capabilities.
- Guided by Experienced Faculties
- We offer services for Cold Chain Applications.
- Open for Industry and Educational Institutions.

Charges:

- **Academic Institution & Government Organization:**
INR. 5000/- per day
- **Industry:**
INR. 8000/- per day



All charges mentioned above are excluding GST | Charges may be revised from time to time as per Institute norms
Charges may vary based on the nature of work

CENTRAL WORKSHOP



CNC Turning Machine

Make:VX200

Max RPM:6000 Range:

X Axis 250 mm Z Axis 500mm

For Academic Institution & Government Organization:

INR. 750/hr

For Industry: INR. 1000/hr

(Charges for Material & Tools extra)

Vertical Milling Machine

Make:V544

MaX RPM:8000 Range:

Z Axis 450 mm X Axis 400,

Y-Axis 300mm

For Academic Institution &

Government Organization: INR.900/hr

For Industry: INR. 1200/hr

(Charges for Material & Tools extra)

Facilities:

The Workshop comprises of the following fully equipped shops.

- CNC Turning Machine
- Vertical Milling machine
- Machine Shop
- Welding shop
- Carpentry Shop
- Fitting Shop
- Wiring Shop
- Plumbing Shop
- Sheet Metal Shop



Features:

- Comprehensive Research Capabilities
- Guided by Experienced Faculties for Technical Support
- To support the Industry, Define Problems, Training, and Academics
- Enables students to experience the challenges and demands of a real industrial work environment
- Strengthens students' confidence by engaging them in various manufacturing processes through hands-on learning
- Open for Industry and Educational Uses

**All charges mentioned above are excluding GST | Charges may be revised from time to time as per Institute norms
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AERODYNAMICS AND PROPULSION LABORATORY

(Developed under CoE: Aerospace & Defence, IITRAM)

Funded by Government of Gujarat



Low-Speed Subsonic Wind Tunnel

It is tailored for scenarios such as takeoff, landing, and other low-speed flight regimes. This tunnel typically features a carefully controlled environment with adjustable wind speeds, to investigate the aerodynamic behavior of models, airfoils, and vehicles at reduced velocities.

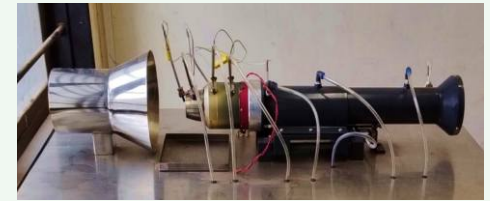


Aerodynamics Trainer

provide the practical insights into the principles and applications of aerodynamics. It consists of scaled-down models, representing components like wings, airfoils, or complete aircraft. Understanding the practical application, preparing for challenges in aircraft design, performance optimization, and related aerospace engineering tasks.



Axial Flow Gas Turbine Test Rig



The axial-flow gas turbine test rig is a specialized facility designed for the experimental study and analysis of axial-flow gas turbine engines. The rig is crucial in the field of aerospace engineering, providing a controlled environment for researchers and engineers to assess the performance, efficiency, and characteristics of axial-flow turbines. Detailed investigations into the aerodynamics, combustion processes, and overall behavior of the turbine.

Features:

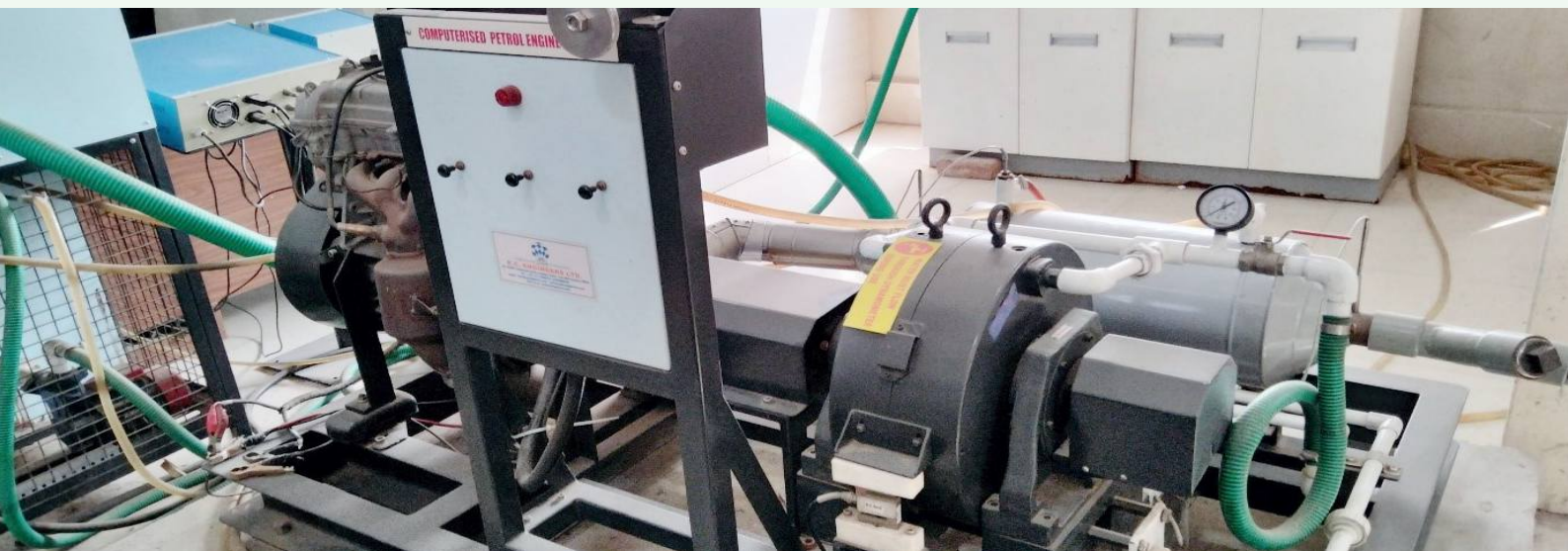
- Comprehensive Testing and Research Capabilities available
- Guided by Experienced Faculties for Technical Support
- To support the Industry, Define Problems, training, and academics
- Enables students to experience the challenges and demands of a real industrial work environment
- Open for Industry and Educational Uses

Charges:

- **Academic Institution & Government Organization:** INR. 6000/- per day
- **Industry:** INR. 10,000/- per day

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



Computerized Testing Facility Petrol Engine

Computerized Testing Facility Diesel Engine

Charges:
Academic Institution & Government Organization:

INR. 7500/- per day+ consumable charges

Industry:
INR. 2500/hr + consumable charges



Features:

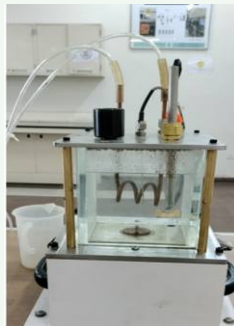
- The lab conducts experimental performance evaluations on a wide range of internal combustion (IC) engines using various fuels, including biofuels.
- It also supports the analysis of exhaust smoke, emissions, and diagnostic evaluations of IC engines, along with component testing for IC engine-based vehicles.
- Equipped with computer-assisted tools and dynamometers, the lab meets the needs of undergraduate, postgraduate, and research students at IITRAM.
- Its state-of-the-art facilities make it capable of undertaking consultancy projects related to the performance testing of IC engines and vehicles powered by conventional fuels and biofuels.
- Available equipment include: AVL smoke meter, Five gas analyser, Computerized multi Cylinder 4 Stroke petrol engine Test Rig; Computerized twin Cylinder 4 Stroke Water cooled Diesel engine Test Rig with multi fuel (Diesel + CNG) facility and exhaust gas recirculation.
- Comprehensive Testing and Research Capabilities available.
- Guided by Experienced Faculties for Technical Support.
- To support the Industry, Define Problems, Training, and Academics.
- Enables students to experience the challenges and demands of a real industrial work environment.
- Open for Industry and Educational Uses.

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HEAT AND MASS TRANSFER LABORATORY



Pulsating heat pipe



Pool boiling set up



Heat Conduction apparatus for Bi-metallic rods

Equipments:

- Free and forced convection apparatus
- Radiation heat transfer apparatus
- Pool boiling set up
- Heat exchanger apparatus
- Pulsating heat pipe
- Heat Conduction apparatus for Bi-metallic rods

Features

- The Heat Transfer Laboratory is equipped with several experimental setups focused on fundamental heat transfer concepts and their practical applications.
- These setups are integrated into the curriculum for third-year undergraduate students enrolled in the heat transfer course.
- it also meets the needs of postgraduate and research students at IITRAM.
- Comprehensive Testing and Research Capabilities available.
- Guided by Experienced Faculties for Technical Support
- To support the Industry, Define Problems, training, and academics.
- Enables students to experience the challenges and demands of a real industrial work environment.
- Open for Industry and Educational Uses

Charges:

Academic Institution & Government Organization: INR.500/-per hour + consumable charges

Industry: INR. 750/-per hour + consumable charges

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ROBOTICS AND AUTOMATION LAB



Dobot M1 Scara Robot



Dobot Magician Robot

Major Equipment:

1. Dobot Magician
2. Dobot M1
3. SCARA-Based Configuration

Features:

1. Hands-On Access to Advanced Robotics
2. Multi functional Capabilities
3. Precise and High-Speed Operations
4. Experienced Faculty Guidance
5. Open for Industry and Educational Uses

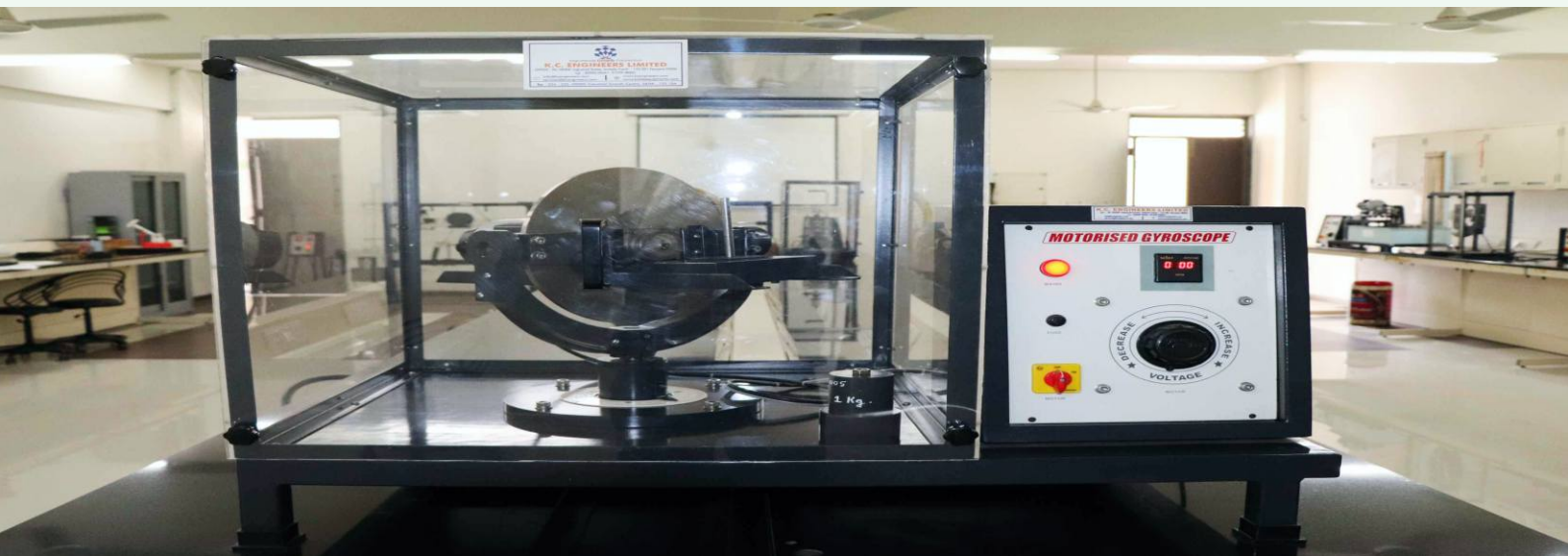
Charges:

Academic Institution & Government Organization: INR. 6000 per day

Industry: INR. 10,000 per day

All charges mentioned above are excluding GST | Charges may be revised from time to time as per Institute norms
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THEORY OF MACHINES AND MECHANISMS LABORATORY



Universal Vibration apparatus



Journal bearing test Rig



Rotating mass balancing Machine

Equipment:

1. Universal Vibration apparatus
2. Journal bearing test Rig
3. Rotating mass balancing Machine
4. Cam Analysis Apparatus
5. Epicyclic Gear Train Apparatus (With Digital Rpm Indicator)
6. Digital Stroboscope
7. Digital Tachometer:
8. Universal Vibration Apparatus
9. Universal Vibration Apparatus (Free and Forced Vibration System)
10. Whirling of Shaft Demonstrator (With Digital Rpm Indicator)
11. Static & Dynamic Balancing Demonstrator
12. Motorised Gyroscope (With Digital Rpm Indicator)
13. Journal Bearing Apparatus (With Digital Rpm Indicator)
14. Michell Tilting Pad Bearing Apparatus

Features:

1. Hands-On Access to Advanced Machinery:
2. Comprehensive Testing Capabilities:
3. Precise Measurement Tools:
4. Experienced Faculty Guidance:
5. Open for Industry and Educational Use

Charges:

Academic Institution & Government Organization:

INR. 6000 per day

Industry:

INR. 10,000 per day

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



Pelton Wheel Turbine Test Rig

Kaplan Turbine Test Rig

Francis Turbine Test Rig

Specifications:

Output power: 1 kW
 Max discharge: within 1000-1500 LPM
 Supply head: 5-8 M
 Normal speed: 1500-2000 RPM

Specifications:

Output power: 1 kW
 Max discharge: within 1000-1500 LPM
 Supply head: 5-8 M
 Normal speed: 1500-2000 RPM

Specifications:

Output Power: 1 kW
 Discharge: 1000 LPM (approx.)

Equipment:

1. Pelton Wheel Turbine Test Rig
2. Kaplan Turbine Test Rig
3. Francis Turbine Test Rig
4. Hydraulic Ram Test Rig
5. Centrifugal Pump Test Rig
6. Reciprocating Pump Test Rig
7. Gear Pump Test Rig
8. Submersible Pump Test Rig
9. Lobe Pump Test Rig
10. Hydraulic Press Machine (power operated)

11. Pneumatic Trainer
12. Hydraulic Trainer

Features:

- Comprehensive Training/Experimental Capabilities
- Guided by Experienced Faculties for Technical Support
- Open for Industry and Educational Uses

Charges:

Academic Institution & Government

Organization:

INR. 5000 (per session of 3 hours)

**All charges mentioned above are excluding GST | Charges may be revised from time to time as per Institute norms
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ADVANCED MANUFACTURING PROCESSES LABORATORY



Cryogenic Machining Facility set-up



Electrical Discharge Machining (Wire-Edm)



Fluke 435-II Energy Analyser Power Quality and Energy Analyser



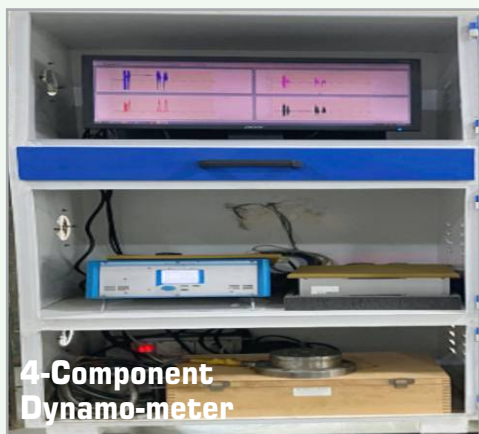
Mitutoyo's Toolmakers Microscopes



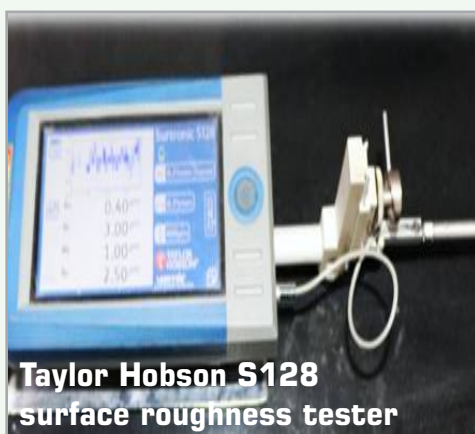
Ultrasonic Assisted Turning Facility



Electrostatic minimum quantity lubrication set up



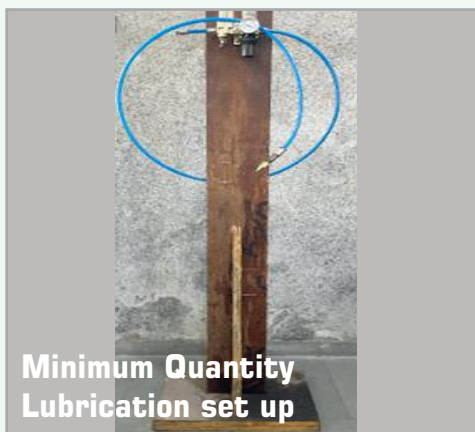
4-Component Dynamo-meter



Taylor Hobson S128 surface roughness tester



Electrostatic lubrication set up



Minimum Quantity Lubrication set up

All charges mentioned above are excluding GST | Charges may be revised from time to time as per Institute norms
Charges may vary based on the nature of work

ADVANCED MANUFACTURING PROCESSES LABORATORY

(Developed under CoE: Aerospace & Defence, IITRAM)

Funded by Government of Gujarat



Vision-based Digital Tool Maker Microscope

Features:

- Tool wear measurement with accuracy of 1 micron.
- Equipped with 5 MP CMOS camera for clear and real time image capturing.
- CMOS Color Camera and Calibration Slide 10/100 mm

Charges:

Academic Institution & Government Organization: INR. 1500/- per sample

Industry: INR. 2000/- per sample

Equipments:

- Cryogenic Machining Facility set-up
- Wire Cut: Electrical discharge machining
- Fluke 435-II Energy Analyzer Power Quality & Energy Analyzer
- 4-Component dynamo-meter.
- Taylor Hobson S128 surface roughness tester:
- Mitutoyo's Toolmakers Microscopes.
- Ultrasonic Assisted Turning Facility
- EMQL Assisted Machining Facility
- EL Assisted Machining Facility
- MQL Assisted Machining Facility

Features:

- Access to Advanced Equipment for Advanced Manufacturing processes.
- Comprehensive Research Capabilities.
- Guided by Experienced Faculties.
- Open for Industry and Educational Institutions.

Charges

Sr. No.	Name of Test/Instrument	Unit (Per Sample/ Hour)	Charges for Academic institutions & Government organizations (INR)	Charges for Industry (INR)
1	Vertical Machining Centre: VMC	Per hour	900	1500
2	CNC Electro Discharge Machining -Wire Cut	Labour + machine charges	16 per 100 mm +350/hour	25 per 100 mm +500/hour
3	Surface Roughness Tester	Per hour	2850	3500
4	Tool Maker Micro -Scope	Per hour	2800	3500
5	Fluke 435 -II Power Quality and Energy Analyser	Per hour	2500	3500
6	EMQL (Electrostatic spraying and minimum quantity lubrication) Assisted Machining Facility	Per hour	2500	3500
7	EL(Electrostatic) Assisted Machining Facility	Per hour	2500	2950
8	MQL Assisted Machining Facility	Per hour	1000	1100
9	Cryogenic Machining Set -up (LN2 Cylinder, LCO2 Cylinder)	Per hour	2500	3500
10	4-Component Dynamometer	Per hour	3100	4000

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