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## 11. Other Facilities to Support Research

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## 1. Medicinal Plant Garden: A Blend of Tradition and Technology

Atmiya University has taken a significant step towards integrating traditional knowledge with modern technology by developing a state-of-the-art *Medicinal Plant Garden*. This unique initiative aligns with the university's commitment to academic excellence, environmental sustainability, and experiential learning.

**Key Features of the Medicinal Plant Garden**

1. **Diverse Collection of Medicinal Plants**

- **The garden houses more than 60 medicinal plants, meticulously curated to represent a wide spectrum** of species with therapeutic importance. These plants include species used in Ayurveda, traditional medicine, and modern pharmacology, contributing to a holistic understanding of their applications.

2. **Educational and Practical Value**

- **Pharmacy Students**: The garden serves as a live repository for students studying pharmacognosy, medicinal chemistry, and phytochemistry. It enables hands-on learning for the identification, collection, and study of medicinal plants.
- **Botany Students**: It provides a platform for taxonomy, plant physiology, and ethnobotanical studies, encouraging interdisciplinary collaboration.

3. **Technological Integration: QR Code System**

- Each plant in the garden is equipped with a **QR code**. By scanning the code using any smartphone, visitors can instantly access **comprehensive information** about the respective plant.
- The information provided includes:
  - Scientific name and taxonomy
  - Medicinal uses and traditional applications
  - Active constituents and pharmacological properties
  - Geographical distribution and cultivation details
  - Conservation status and sustainability practices

4. **Advancing Digital Literacy and Eco-consciousness**

- The QR code system enhances **digital literacy** by promoting the use of technology among students and visitors.
- It encourages **eco-consciousness**, showcasing the importance of medicinal plants in sustainable healthcare and biodiversity conservation.

5. **Accessibility and Inclusivity**

- The QR-based system democratizes knowledge by making information accessible to everyone, including students, faculty, and visitors from outside the university.

Atmiya University Rajkot

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Atmiya University, Rajkot

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Atmiya College/central School, Nandanavan Society, Vrindavan Society, Nana Mava, Rajkot, Gujarat 360005, India
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## 2. Plant Tissue Culture & Animal Cell Culture facility

Plant Tissue Culture & Animal Cell Culture Laboratory designed to provide a comprehensive environment for both academic and professional skill development, the laboratory is equipped with state-of-the-art technology and facilities that support a wide range of cell culture techniques.

### Key Features and Equipment:

- **Laminar Airflow Chambers**: Essential for maintaining sterile conditions, these chambers enable precise handling of biological samples and preparation of culture media.
- **Autoclaves**: Ensure complete sterilization of equipment and media, a critical step in maintaining contamination-free cultures.
- **$CO_2$ Incubators**: Provide controlled conditions of temperature, humidity, and gas concentration, facilitating optimal growth for animal cells and tissue cultures.
- **Inverted Microscopes**: Allow detailed observation of live cell cultures, enabling real-time study of cellular behavior and growth.
- **High-Precision Balances**: Used for accurate measurement of chemicals and reagents in media preparation, ensuring reproducibility and precision in experiments.

### Applications in Plant Sciences:

The laboratory is a crucial resource for research in plant biotechnology, allowing students and researchers to explore various aspects of plant tissue culture, such as:

- **Micropropagation**: Producing large numbers of identical plants from a single explant, essential for agriculture and horticulture.
- **Somatic Embryogenesis**: Developing embryos from somatic cells, advancing studies in genetic improvement and plant breeding.
- **In Vitro Conservation**: Aiding in the preservation of endangered plant species by maintaining genetic resources under controlled laboratory conditions.

These applications prepare students for careers in agriculture, forestry, horticulture, and plant biotechnology, making them valuable assets in industries focused on sustainable development and food security.

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## Applications in Animal Sciences:

For biomedical and biotechnological research, the laboratory supports advanced studies in:

- **Cell Line Development**: Culturing specific types of animal cells for pharmaceutical, therapeutic, and diagnostic purposes.
- **Cytotoxicity Assays**: Evaluating the effects of drugs, chemicals, and environmental factors on cell viability, critical for drug development and toxicological studies.
- **Tissue Engineering Applications**: Research in creating artificial tissues for regenerative medicine and biomaterial testing.

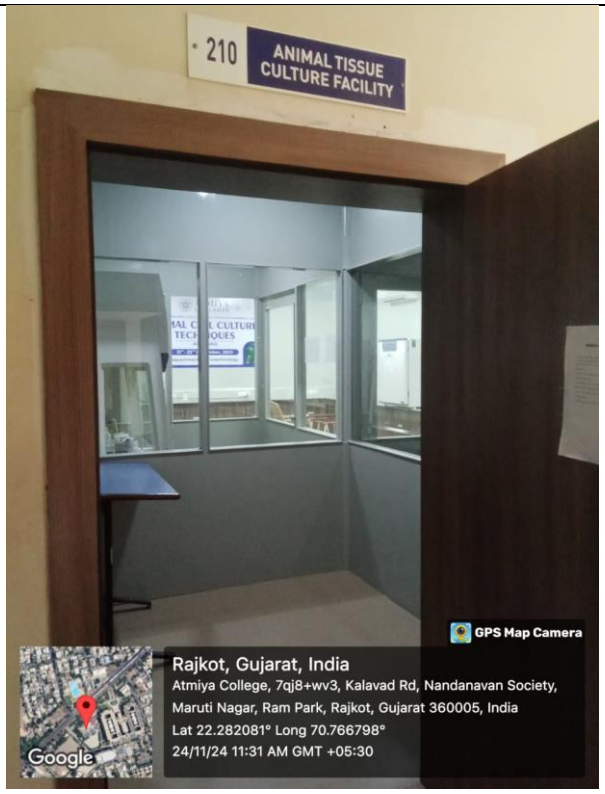
These capabilities enable students to develop expertise relevant to careers in pharmaceuticals, biomedical engineering, and medical research.

## Research and Innovation Hub:

This laboratory is actively utilized at Atmiya University for research and innovation purposes, bridging the gap between theoretical knowledge and real-world applications. Students gain hands-on experience in designing and executing experiments, interpreting results, and troubleshooting challenges in a professional laboratory environment. The facility encourages interdisciplinary collaboration, with students and faculty from diverse fields working together to address complex biological problems.

## Benefits to Students and Researchers:

- **Skill Development**: Students acquire critical technical skills, including aseptic techniques, media preparation, and data analysis, which are highly sought after in both academic and industrial settings.
- **Research Opportunities**: Access to advanced equipment allows students to undertake meaningful research projects that contribute to scientific knowledge and innovation.
- **Career Readiness**: The practical training offered in the laboratory ensures that graduates are well-prepared for careers in biotechnology, agriculture, pharmaceuticals, and biomedical sciences.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ANIMAL TISSUE CULTURE FACILITY
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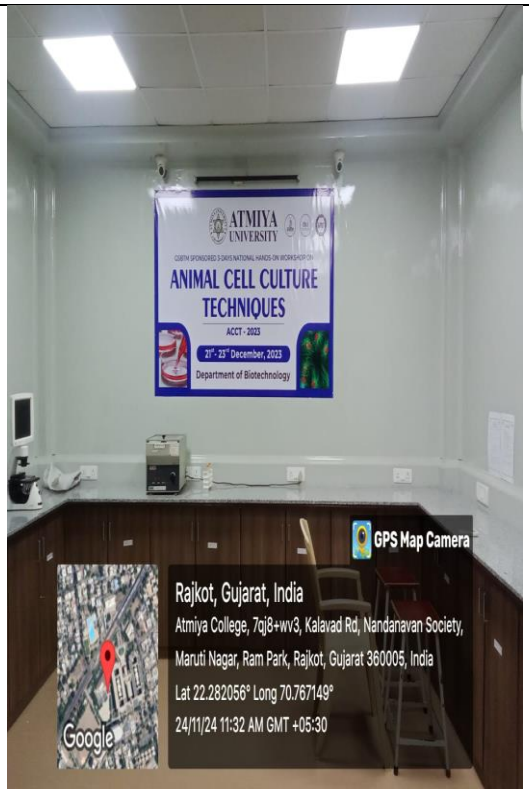
ATMIYA UNIVERSITY
ANIMAL CELL CULTURE TECHNIQUES
ACCT - 2023
21st - 23rd December, 2023
Department of Biotechnology
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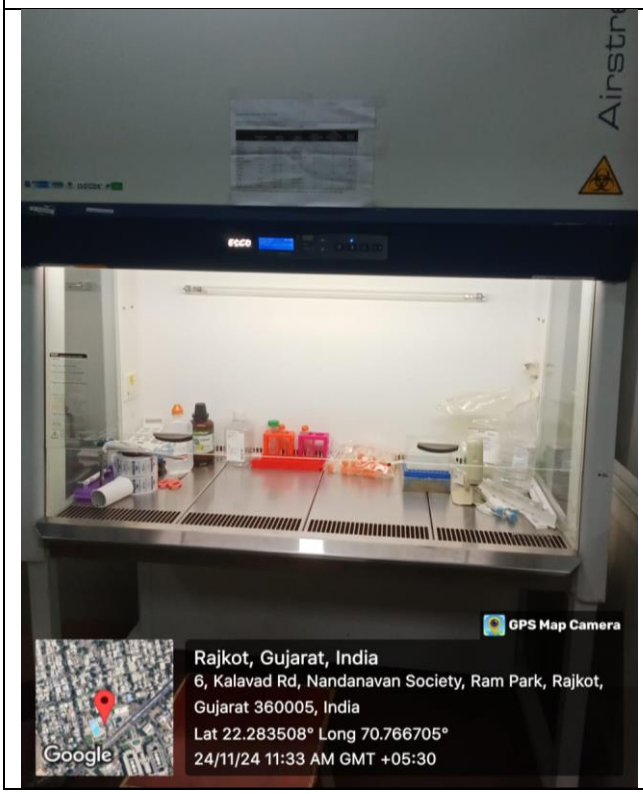
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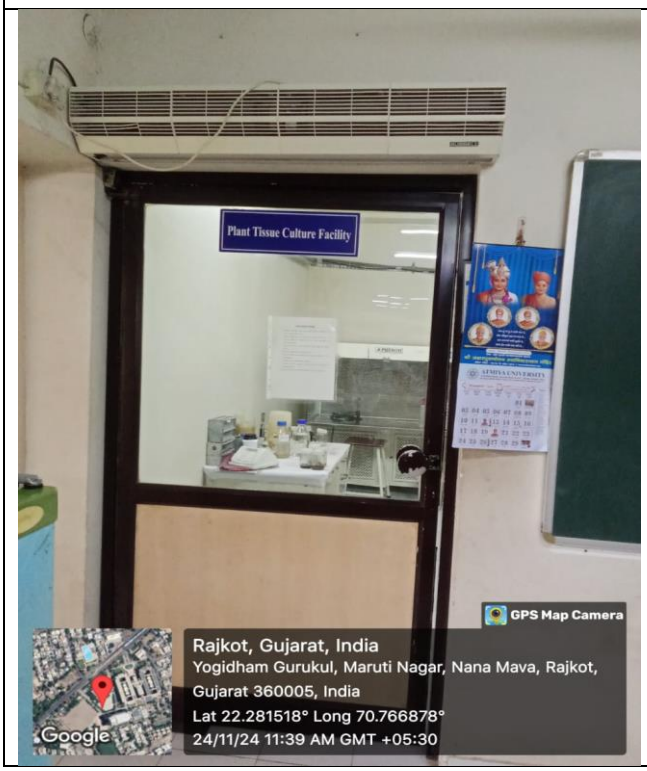
Plant Tissue Culture Facility
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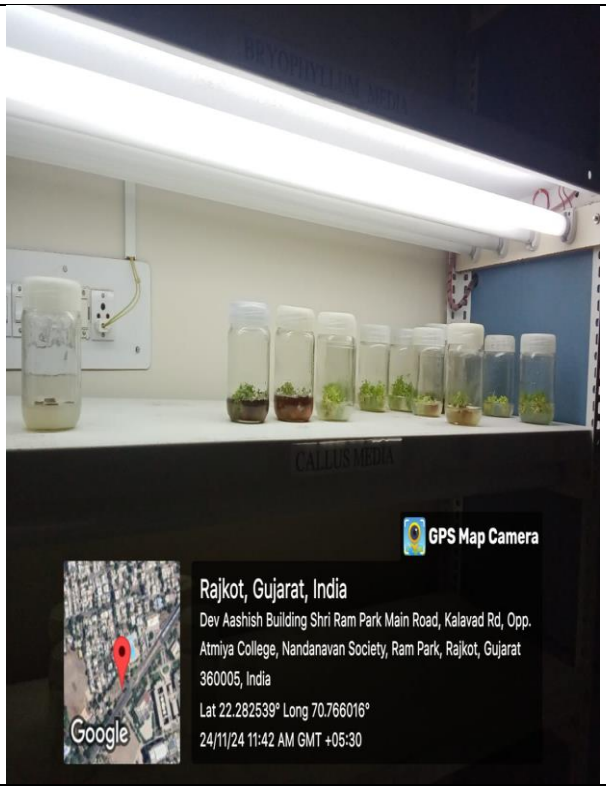
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## 3. Genetic Engineering Lab

The Genetic Engineering Laboratory at Atmiya University is a premier facility dedicated to exploring the realms of molecular biology, genetic manipulation, and biotechnological innovations. This advanced laboratory provides students and researchers with hands-on experience and equips them with the tools necessary for understanding and manipulating genetic material. It is a key element of the university's strategy to foster research-driven learning, enabling students to tackle challenges at the cutting edge of biotechnology.

**Key Features and Equipment:**

- **PCR Machines**: Essential for amplifying DNA sequences, PCR technology allows students to conduct high-precision analyses of genetic material, playing a pivotal role in research applications such as gene expression studies and diagnostics.
- **Gel Electrophoresis Systems**: These systems are used for the separation and analysis of DNA, RNA, and proteins, enabling students to visualize molecular markers, identify gene fragments, and verify cloning success.
- **Spectrophotometers**: These are used for quantifying nucleic acids and proteins, providing students with the ability to assess the purity and concentration of their samples, which is essential in molecular biology experiments.
- **Cloning Tools**: The laboratory is equipped with the necessary tools for gene cloning, such as restriction enzymes, ligases, and vectors, allowing students to manipulate DNA and insert genes into suitable host organisms.

**Research and Learning Areas:**

The laboratory's diverse set of tools and resources supports a wide variety of genetic engineering and molecular biology research:

- **DNA Extraction and Gene Cloning**: Students learn the principles and techniques behind DNA extraction, gene cloning, and the creation of recombinant DNA molecules. This foundational knowledge is essential for a deeper understanding of genetic manipulation.
- **Recombinant DNA Technology**: By studying plasmid design, transformation techniques, and recombinant DNA, students gain proficiency in genetic engineering practices that are fundamental to modern biotechnology.
- **CRISPR-mediated Gene Editing**: The laboratory is equipped to explore one of the most transformative technologies in genetics, CRISPR-Cas9. Students learn the principles and applications of gene editing, allowing them to design experiments aimed at modifying specific genes within organisms.


Genetic Engineering Lab
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## 4. I-MAC lab

The **Apple iOS Lab** at **Atmiya University** is a **state-of-the-art facility** designed to foster **academic and technological excellence**. Equipped with **10 Apple systems**, including **6 Mac Mini** and **4 iMac systems**, the lab provides students with **hands-on experience** in iOS application development, preparing them for careers in the **rapidly growing mobile technology industry**. It serves as a **hub for innovation and research**, enabling students and faculty to explore advanced technologies such as **Swift**, **Xcode**, **AI (Artificial Intelligence)**, and **Machine Learning** within the Apple ecosystem.

By integrating this lab into the university's curriculum, **Atmiya University** ensures that students receive **practical knowledge** that complements theoretical learning, enhancing their **skills and employability**. The lab supports **specialized training programs**, **workshops**, and **certifications in iOS development**, enabling students to gain **competitive credentials**. Furthermore, it promotes an **entrepreneurial mindset** by empowering students to develop and deploy their own applications on the **Apple App Store**, offering **real-world exposure** and monetization opportunities.

The facility also acts as a platform for **collaboration with industry**, hosting **hackathons**, **coding competitions**, and **live projects** that prepare students for **professional challenges**. Faculty members benefit from training on the **latest Apple technologies**, ensuring **high-quality mentorship**. Additionally, the lab encourages **interdisciplinary projects** that address real-world problems across various domains, from **healthcare to business**. By providing a **globally competitive infrastructure**, the **Apple iOS Lab** contributes to the **regional economy** and supports the growth of **skilled iOS developers**, making it a cornerstone of excellence at **Atmiya University**.

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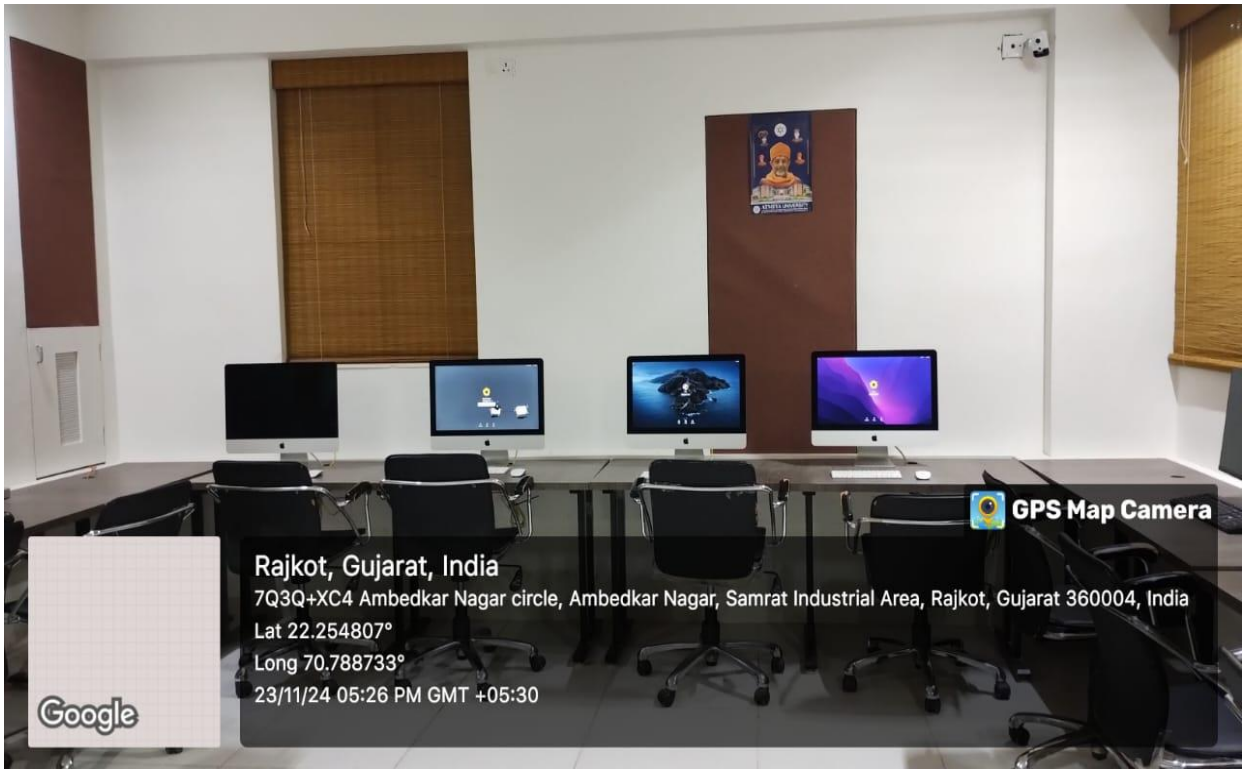


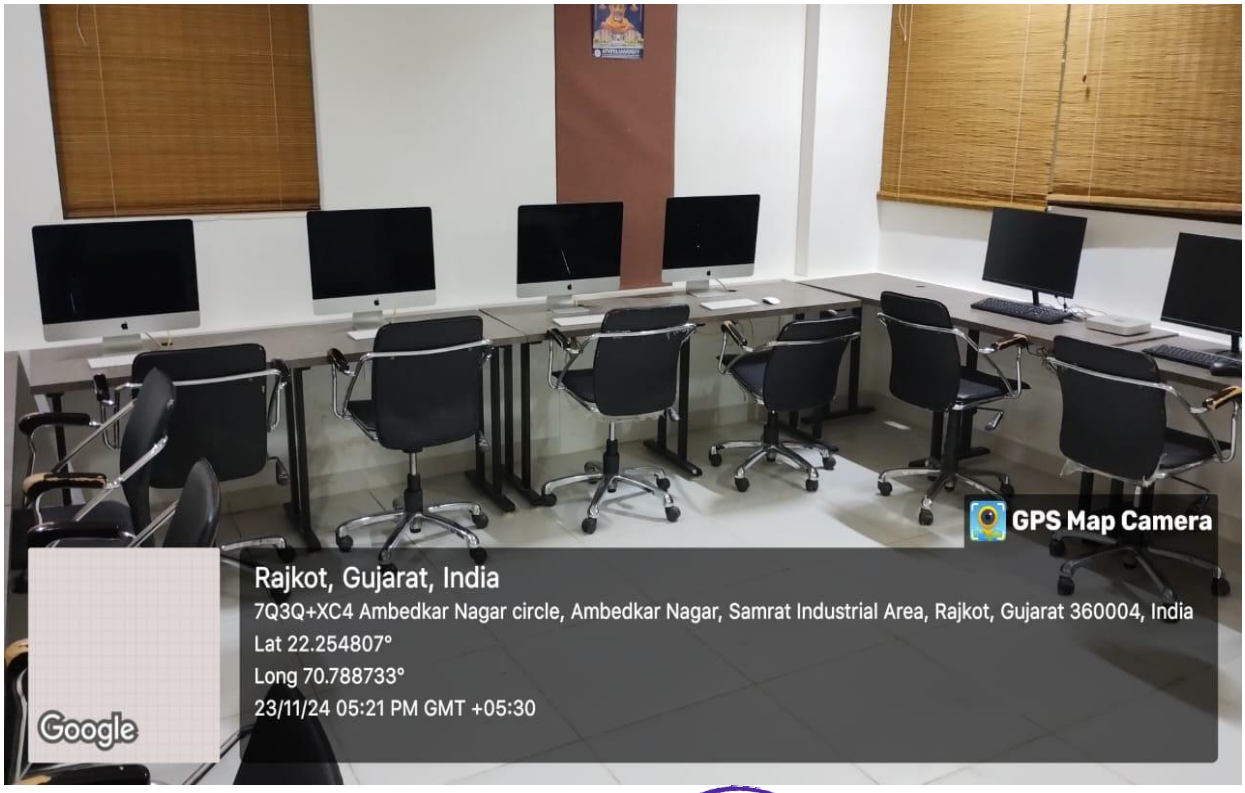


Atmiya University Rajkot

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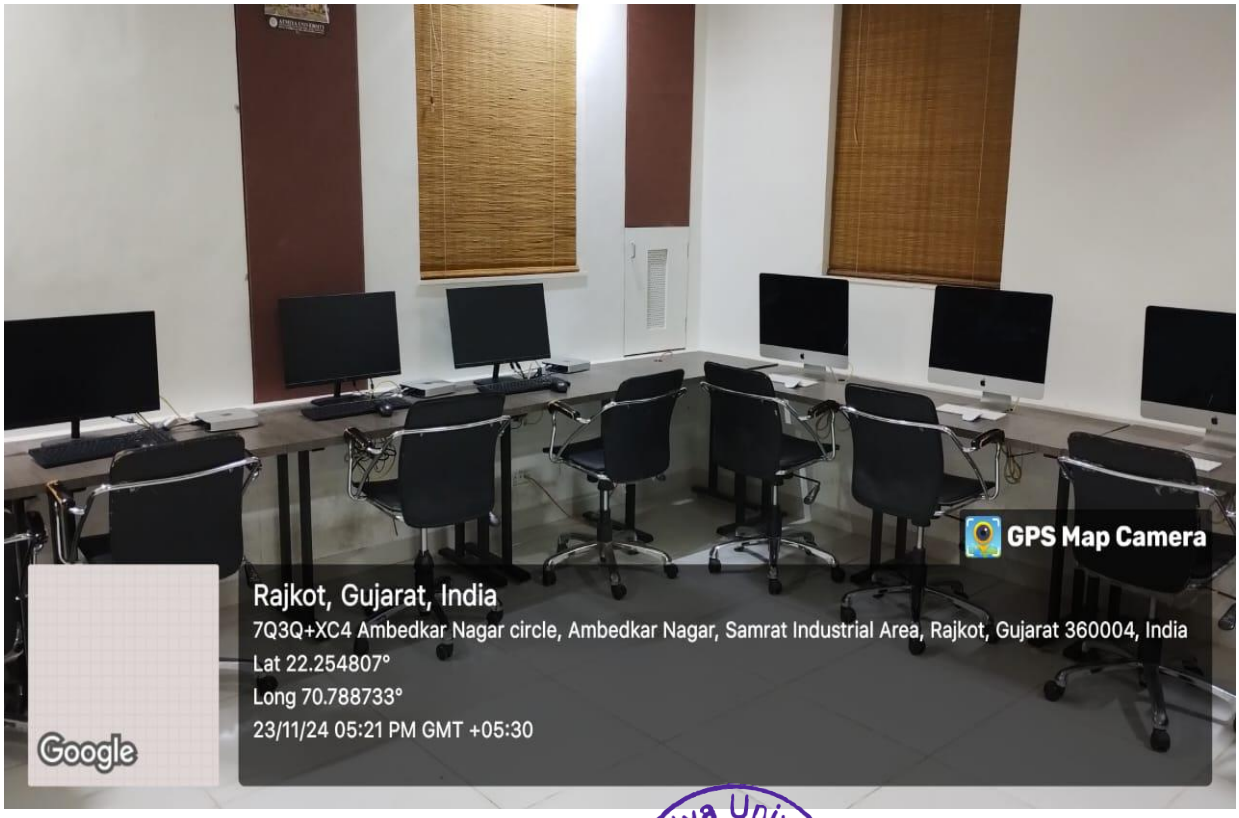


Atmiya University Rajkot

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## 5. *Pravartanam* – Automotive Skill Lab

***Pravartanam*** - **Automobile Skill Lab** typically refers to a practical training environment or workshop where individuals learn hands-on skills related to the automobile industry. This can involve a variety of tasks related to vehicle maintenance, repair, design, and innovation. It is a part of technical education programs or automotive engineering degrees.

Key features and components of an **Automobile Skill Lab**:

### 1. Engine Repair & Maintenance

- Learning how to diagnose and repair common engine problems.
- Understanding different types of engines (internal combustion, electric, hybrid).
- Hands-on training in replacing parts like spark plugs, timing belts, filters, and more.

### 2. Electrical & Electronics Systems

- Understanding electrical systems such as the battery, wiring, and lighting.
- Troubleshooting issues related to sensors, alternators, and fuses.
- Learning to work with modern car electronics like infotainment systems, ECU, and OBD.

### 3. Transmission & Drivetrain Systems

- Learning the basics of manual and automatic transmissions.
- Studying the components of the drivetrain, including the clutch, differential, axles, and driveshafts.
- Hands-on repair and maintenance tasks, like fluid changes and part replacements.

### 4. Suspension & Steering

- Understanding how suspension systems work to ensure vehicle stability and comfort.
- Working on parts like shock absorbers, struts, ball joints, and steering components.
- Diagnosing issues like steering wheel misalignment or ride height problems.

### 5. Braking Systems

- Learning the principles behind hydraulic brakes, disc brakes, and drum brakes.
- Hands-on practice in replacing brake pads, fluid, and rotors.
- Troubleshooting issues like brake fading or vibrations.

### 6. Cooling & Air Conditioning

- Repairing and maintaining the cooling system, including the radiator and thermostat.
- Working with Air Conditioning systems and understanding refrigerant use and repair.
- Diagnosing common issues like overheating or insufficient cooling.

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**7. Bodywork & Paint**

- Training in dent removal, rust repair, and body panel replacement.
- Learning how to repaint and resurface vehicle exteriors.
- Understanding safety features like airbags and seat belts.

**8. Tire & Wheel Service**

- Learning how to replace and balance tires.
- Understanding alignment and the importance of tire rotation and pressure.
- Hands-on training for mounting and dismounting tires.

**9. Diagnostic Tools and Software**

- Learning to use modern diagnostic equipment, like OBD-II scanners, to troubleshoot car issues.
- Familiarization with software used in vehicle diagnosis and repair.

**10. Alternative Fuels & Electric Vehicles**

- Understanding hybrid and electric vehicle (EV) technologies.
- Gaining skills in maintaining and repairing EV-specific components like battery packs and electric motors.
- Learning about charging systems, range estimation, and energy recovery systems.

**11. Hybrid and Electric Vehicle (EV) Systems**

- Learning the differences between internal combustion engine (ICE) vehicles and electric/hybrid models.
- Understanding the complexities of charging infrastructure, battery management systems, and regenerative braking.

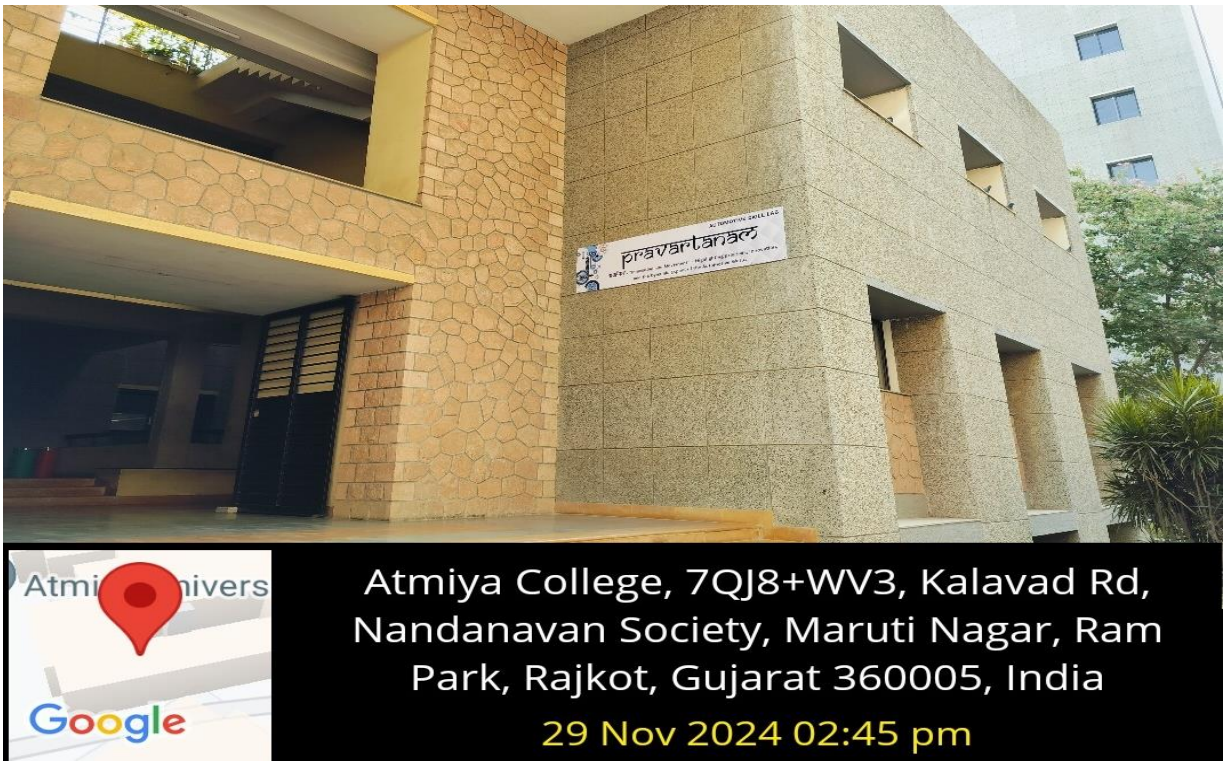
**12. Vehicle Safety Systems**

- Learning about advanced safety features like airbags, crash sensors, and anti-lock braking systems (ABS).
- Hands-on experience with safety equipment installation and diagnostics.

**13. Automotive Materials & Manufacturing**

- Study of different materials used in car manufacturing such as metals, composites, and plastics.
- Introduction to the manufacturing processes like welding, molding, and assembly.

***Pravartanam* – Automotive Skill Lab**




**Vehicle Body Engineering**

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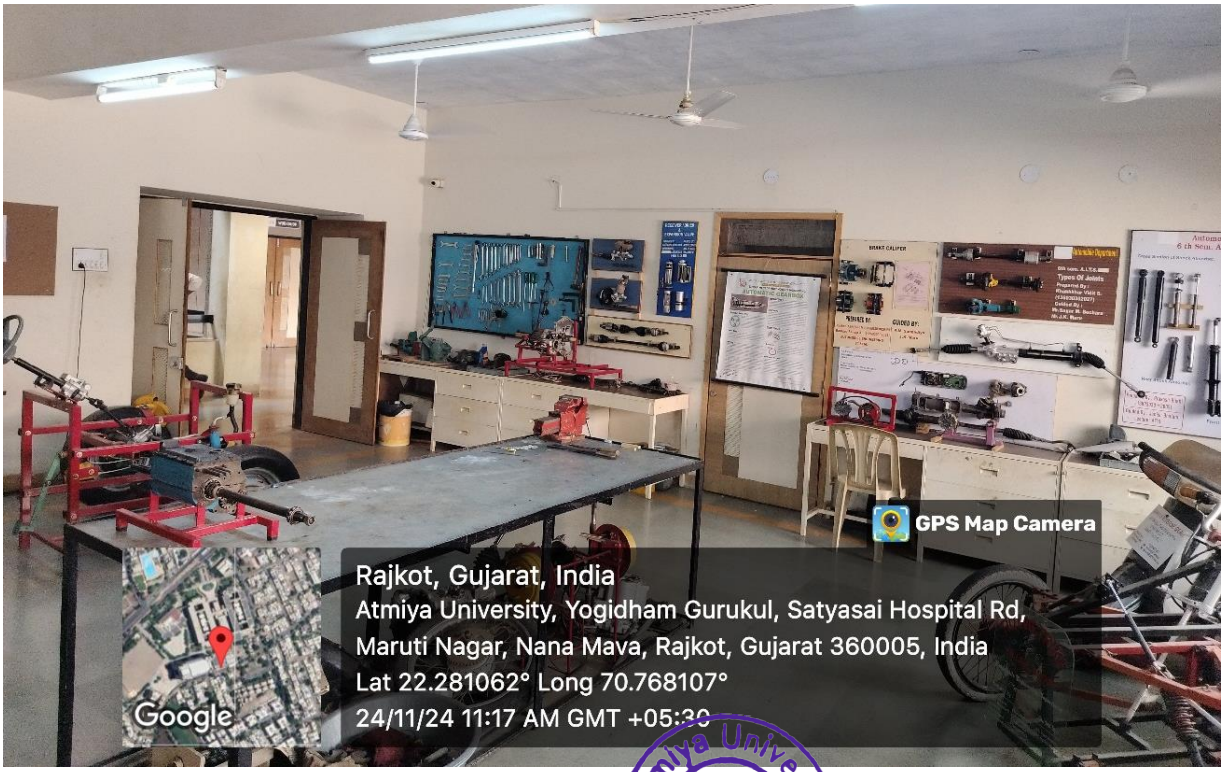
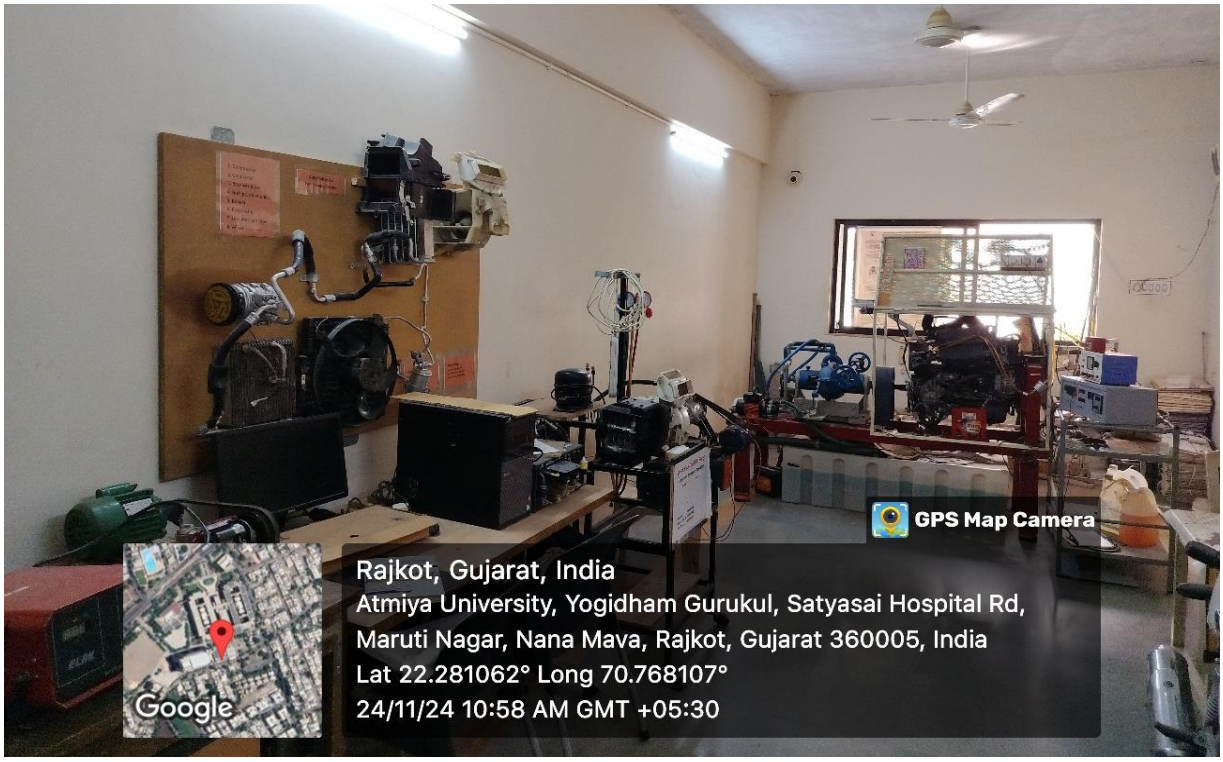
**Automobile Engine**


**Automobile Transmission System**

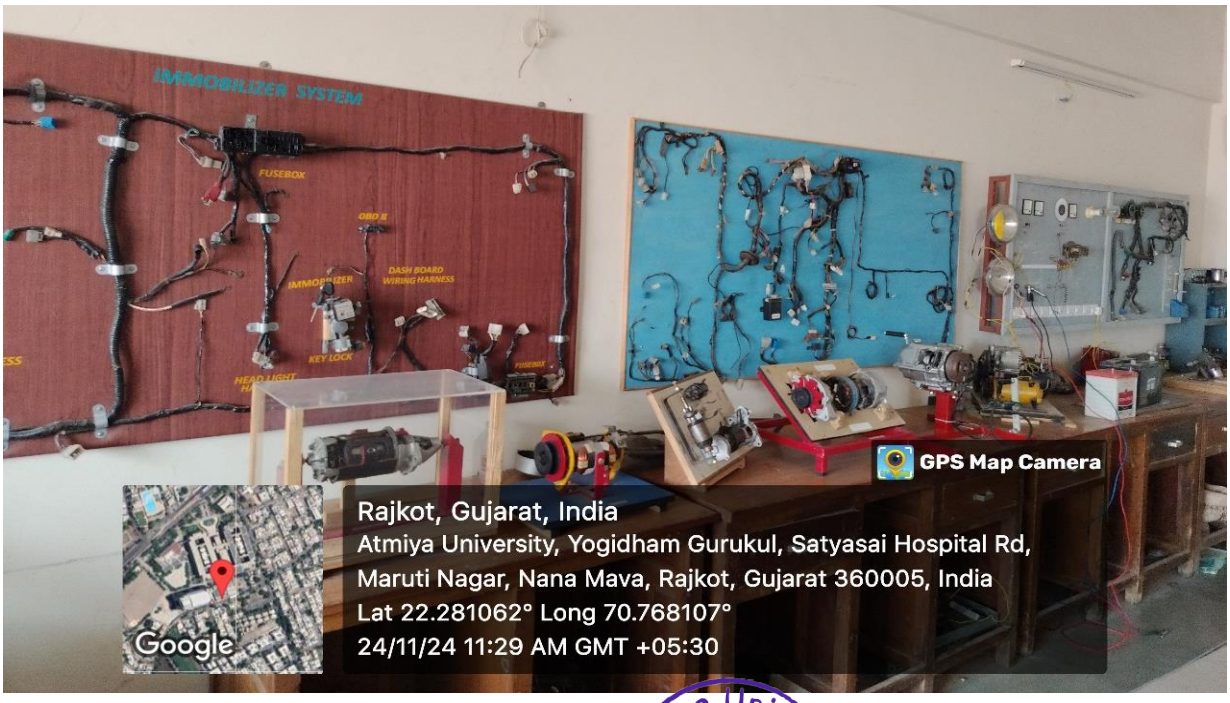



Atmiya University, Rajkot

## Vehicle Air Conditioning and Fuels & Pollution Control




## Automobile Electrical




Atmiya University, Rajkot

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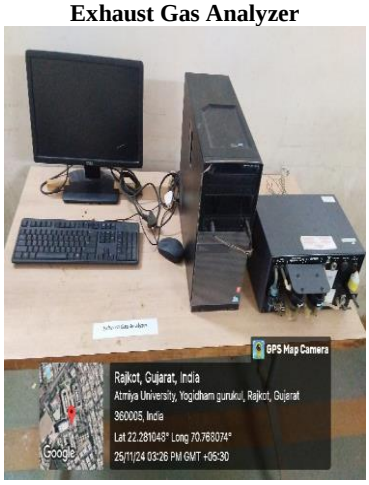
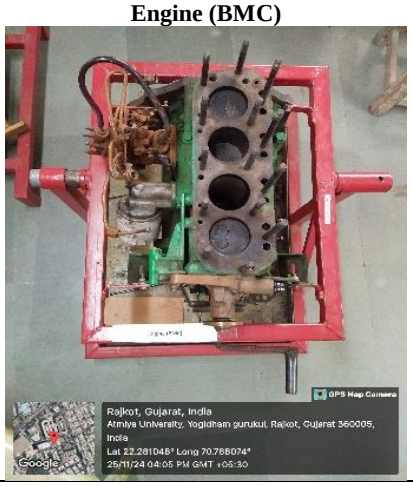
| **Working System of A/C**<br>  | **Automotive Air Conditioning System (Demo)**<br>  | **Exhaust Gas Analyzer**<br>  |
| **Exhaust Assembly with O2 Sensor, Tail Pipe, Muffler, Catalytic Converter**<br>  | **Engine (BMC)**<br>  | **Engine (Isuzu)**<br>  |
| **Engine (Maruti)**<br>  | **Air Filter**<br>  | **Microwave Digestion System**<br>  |

**Double Barrel Carburetor**


**Single Barrel Carburetor**


**Flywheel with Crankshaft**

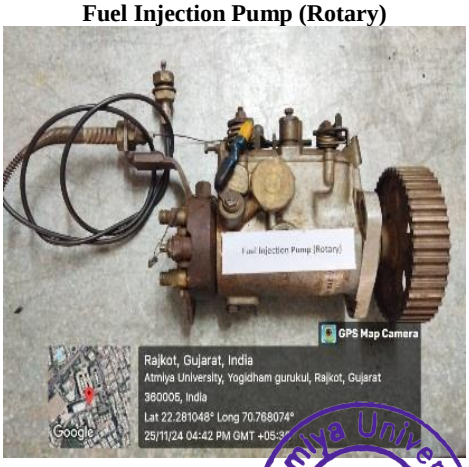

**Piston Connecting Rod Assembly**


**C/S &**
**Disassembly of Turbocharger**


**Fuel Injector Testing Bench**


**Fuel Injection Pump (Inline)**


**Fuel Injection Pump (Rotary)**




**Injector (Atomizer)**

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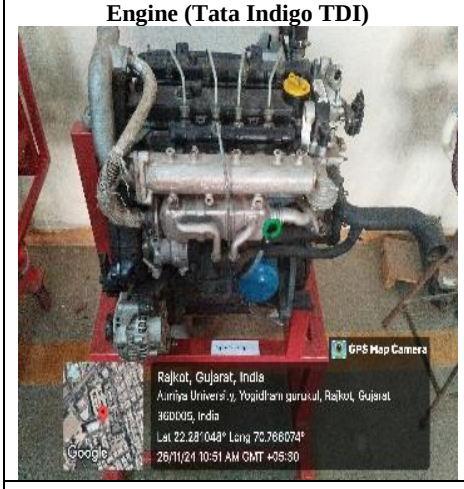
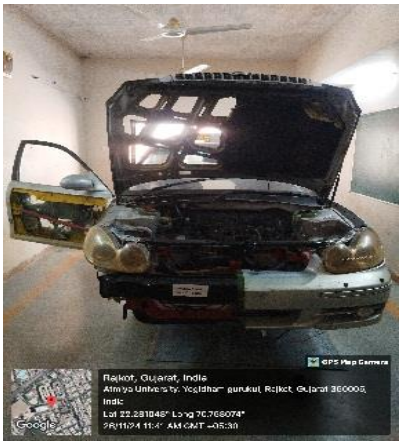
| **Engine (Tata Indigo TDI)**<br>  | **Radiator Assembly with Fan**<br>  | **Engine (Premier)**<br>  |
| **Oil Pump- Gear Type**<br>  | **Oil Pump- Vane Type**<br>  | **Fuel Feed System (Diesel)**<br>  |
| **Fuel Feed System (Petrol)**<br>  | **Cylinder Head with Cam Shaft Assembly**<br>  | **Hyundai Sonata-Body Cut Section**<br>  |

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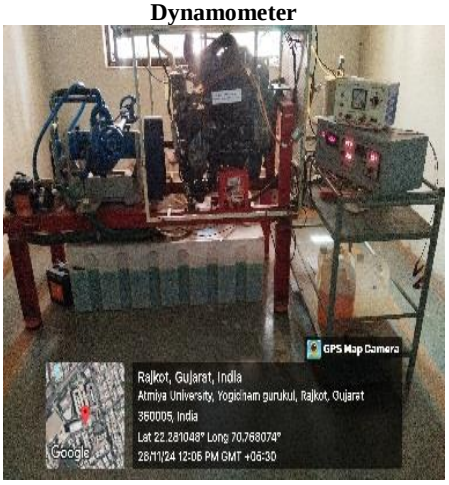
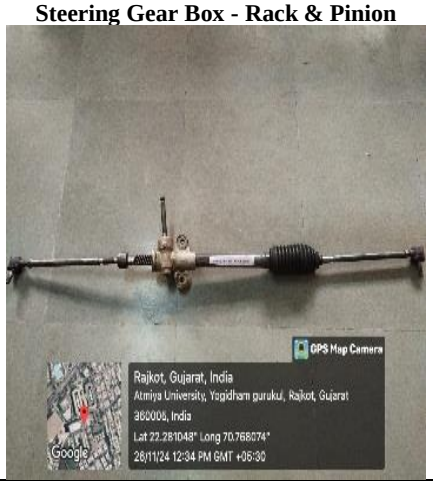
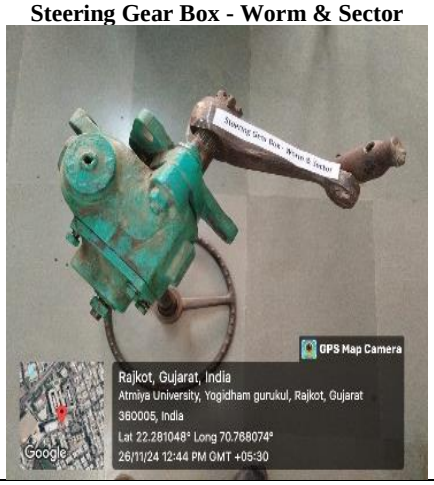
| **Engine Test Bench with Hydraulic Brake Dynamometer**<br>  | **ATP Tool Board**<br>  | **Transaxle Unit (FWD) Cut-Section**<br>  |
| **Steering Gear Box - Rack & Pinion**<br>  | **Steering Gear Box - Warm & Ballnut**<br>  | **Steering Gear Box - Worm & Sector**<br>  |
| **Master Cylinder - Tandem**<br>  | **Master Cylinder-Single Piston**<br>  | **Power Steering Gear Box (Worm & Sector)**<br>  |

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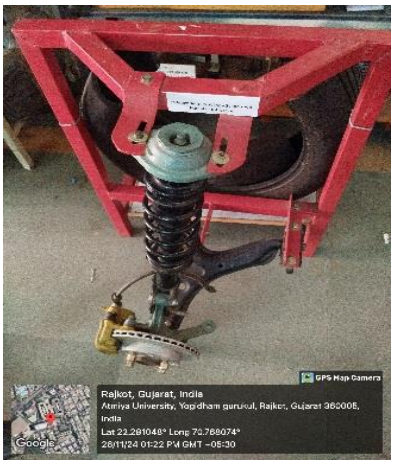
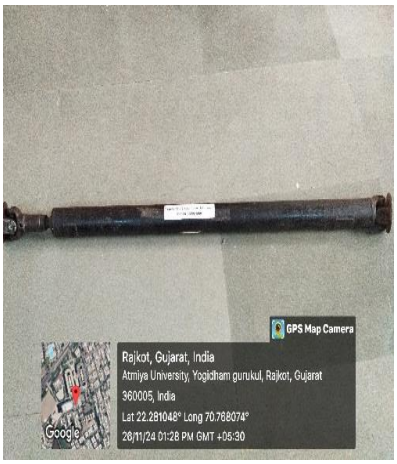
|---|---|---|
| **Pneumatic Shock Absorber**<br>  | **Front Power Steering Mechanism with Double Wishbone Suspension**<br>  | **Rigid Axle Leaf Spring Suspension with Differential**<br>  |
| **Independent Strut Type Suspension Model + Disk Brake**<br>  | **Propeller Shaft Assembly with Universal Joints & Sliding Joint**<br>  | **Automatic Transmission Assembly (FWD)**<br>  |
| **Hydrometer**<br>  | **Torque Converter**<br>  | **Single Plate Clutch Assembly**<br>  |

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| **Single Plate Cut Section**<br>  | **Multiplate Clutch**<br>  | **Power Transmission Assembly (RWD)**<br>  |
| **Gear Box (Cut- Section)**<br>  | **Hydraulic Drum Brake Assembly**<br>  | **Sychromesh Gearbox**<br>  |
| **Pensky Marten Flash Point Apparatus**<br>  | **Cloud and Pour Point Apparatus**<br>  | **Redwood Viscometer-1**<br>  |

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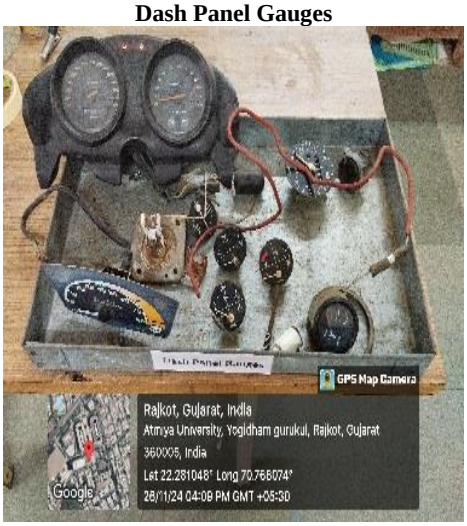
| **Redwood Viscometer-2**<br>  | **U-Tube Viscometer**<br>  | **Centrifugal Clutch**<br>  |
| **Eletronic Ignition System**<br>  | **Battery Demo**<br>  | **Dash Panel Gauges**<br>  |
| **Grwler Armeture Tester**<br>  | **Wiper Assembly**<br>  | **Starter Motor Bendix Drive (Cut-Section)**<br>  |

Registrar
Atmiya University
Rajkot



Atmiya University Rajkot