

Electronics and Communication Engineering Department Government Polytechnic Jamnagar

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Shree. H. J. Baldaniya

Dear Students and Faculty Members, Government Polytechnic Jamnagar is moving ahead on many fronts. In this period consistent efforts and hard work have resulted in overall progress of college. I congratulate and appreciate the efforts of all involved in the process.

Message from hod



Shree A M Bhatt

It is a pleasure to head the Department of EC Engineering in Government Polytechnic Jamnagar. We are a team of experienced and motivated faculty members who are in the process of tuning the young engineers through an innovative teaching learning process. Highly motivated students are our strong team members too, who are always eager to grab the opportunity to improve their skills.

On 06/10/22 the students of 5th semester of EC engineering department have made a visit to GTPL, Jamnagar with EC department staff member A M Bhatt.



Mr. Jayeshbhai explaining networking of GTPL central control room

Mr. Jayeshbhai demonstrating networking equipment to students





Mr Jayeshbhai demonstrating OTDR to students



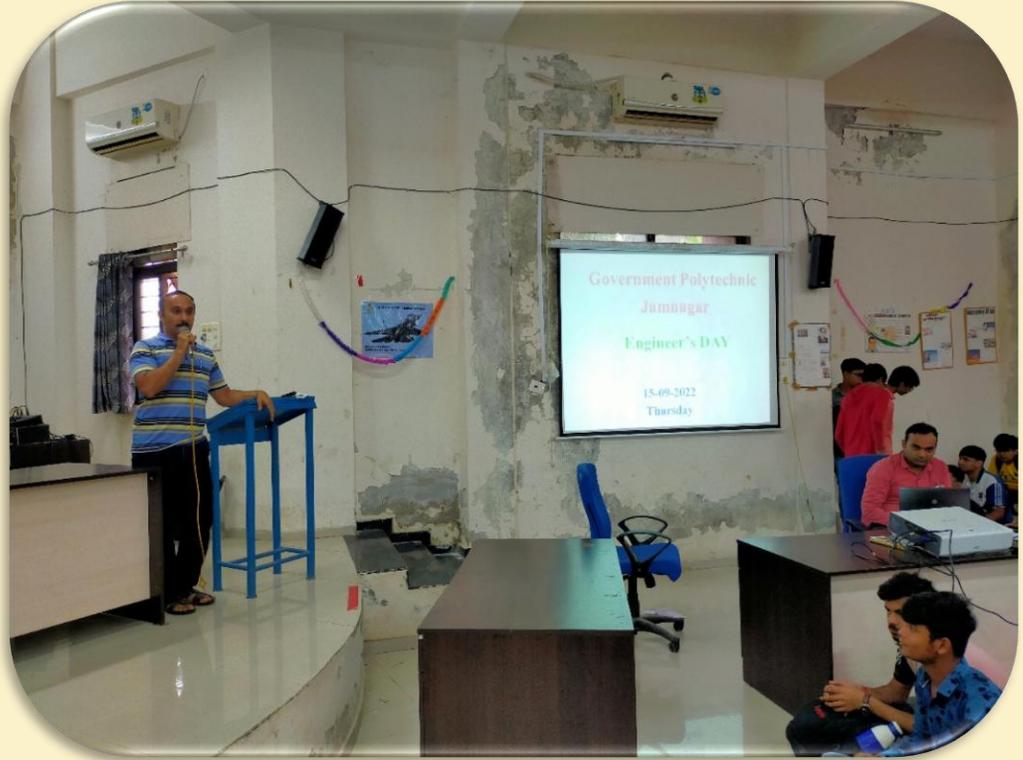
Mr Jayeshbhai explaining 5G router



On 25/11/2022, 3rd sem and 5th sem students and faculty member Mr A M Bhatt from the Electronics and Communication (EC) Department at Government Polytechnic Jamnagar had the privilege of visiting Epowertronics (Uma-Alfa), a leading manufacturer in the field of power electronics. Epowertronics specializes in designing and producing a wide range of products, including online-offline UPS systems, inverters, three-phase rectifiers, and servo



Engineering day Calibration



Live demonstrations were conducted to showcase the user-friendly interface of the online platform, ensuring that students could navigate the process with ease. The event also included an interactive Q&A session, allowing students to seek clarification on specific aspects of the E-FIR system.



The **Electronics and Communication Engineering Department**, Government Polytechnic, Jamnagar, organized an **orientation program** to welcome newly admitted diploma students.

The session introduced students to the academic structure, departmental facilities, faculty members, and institutional rules. Motivational talks were delivered by senior faculty to help students adjust to the new environment and set a positive tone for their academic journey.



Participation in Hackathon at GEC Rajkot

Students of the **Electronics and Communication Engineering Department**, Government Polytechnic, Jamnagar, participated in a state-level Hackathon held at **Government Engineering College, Rajkot** on 7th and 8th October 2022.



SSIP Grant Awarded for Smart Solar Heater Project

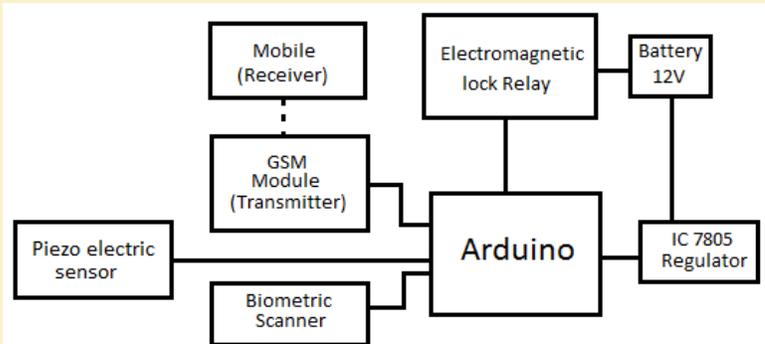
A team of students from the **Electronics and Communication Engineering Department**, Government Polytechnic, Jamnagar, received an **SSIP (Student Startup and Innovation Policy)** grant for their innovative project titled "**Smart Solar Heater**".



Smart Locker with Antitheft Technology – A Step Toward Secure Storage

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The smart locker is designed to provide authorized access using fingerprint recognition and to detect tampering through a vibration sensor. It is also capable of alerting the owner in real-time through GSM-based SMS notifications. The core aim is to offer a secure, cost-effective solution for lockers in homes, hostels, offices, and academic institutions.

Key Components Used

- **Arduino Uno** – Acts as the central control unit
- **Biometric Fingerprint Module (R305)** – For secure, user-specific access
- **Electromagnetic Lock** – Activates upon fingerprint authentication
- **Vibration Sensor (SW-420)** – Detects any physical tampering or force
- **GSM Module (SIM800L/SIM900A)** – Sends SMS alert to user's mobile
- **12V Power Supply** – For lock and controller
- **Buzzer** – Triggers during unauthorized access attempt
- **LCD (16x2)** – Displays system status and messages
- **Keypad (optional)** – Can be used for admin-level password input



Working Principle

1. **Authentication** - A valid fingerprint input from the registered user opens the locker by deactivating the electromagnetic lock.
2. **Security Check** - If an unregistered fingerprint is detected, the locker remains locked, and the buzzer is activated.
3. **Tamper Detection** - If vibration is sensed (e.g., physical force or unauthorized movement), the GSM module sends an **instant SMS alert** to the registered mobile number.
4. **Display and Feedback** - All activity is shown on an LCD, and the system can be reset through a master password or fingerprint.

Educational Value

This project integrates several **core EC subjects**, including:

- **Embedded System Design**
- **Sensor & Actuator Interfacing**
- **Wireless Communication (GSM)**
- **Power Electronics**
- **Human-Machine Interface (HMI)**

Students gained hands-on experience in **real-time programming, hardware implementation, and system testing**, helping bridge the gap between theoretical learning and practical application.

Cost and Outcome

The entire system was built at an approximate cost of ₹6000-₹6500, using locally available components. Despite the modest cost, the prototype successfully demonstrated all core functionalities of a commercial-grade smart locker system.

Conclusion

The Smart Locker with Anti-Theft Technology reflects the creativity, problem-solving approach, and technical capabilities of EC diploma students. It not only serves as an academic project but also as a viable IoT-based security solution for real-life scenarios. Such projects align with the vision of "Make in India" and SSIP (Student Startup and Innovation Policy) by promoting student-led technological innovations for social good.