Force Sensor Usage in Rocket Launches

1. What is a Force Sensor?

A force sensor measures how much force is applied. In rocket applications, it is normally used to measure thrust — the pushing force of the engine. Common sensors include load cells, strain gauges, and thrust stand sensors.

2. Is a Force Sensor Needed for Rocket Flight?

No. A force sensor is not mounted on the rocket during flight because it adds weight, can break due to vibration and heat, and provides no benefit during actual launch. Rockets in flight usually carry sensors like GPS, IMU, and pressure sensors, not force sensors.

3. Is a Force Sensor Needed for Ground Testing?

Yes. Force sensors are essential for static fire testing of rocket motors. They measure:

- Peak thrust
- Thrust curve (thrust vs. time)
- Burn time
- Total impulse
- Engine stability

This information ensures the motor is safe and powerful enough for launch.

4. Common Student-Level Setup

A 50 kg or 100 kg load cell with an HX711 amplifier module connected to an Arduino or ESP32 is typically used to build a thrust stand.

5. Summary

- Not required on the rocket during flight.

- Essential on the ground for testing the engine before launch.