



# SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

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COIMBATORE-641 035, TAMIL NADU



## DEPARTMENT OF AEROSPACE ENGINEERING

### Components of Small Satellites

#### 1. Structure and Chassis:

- The satellite's frame or structure provides mechanical support and houses all other components.
- Materials range from aluminum alloys to carbon composites.
- The chassis design ensures structural integrity during launch and in space.

#### 2. Power System:

- **Solar Panels:** Small satellites typically use solar panels to generate electrical power from sunlight.
- **Batteries:** Energy is stored in onboard batteries for use during eclipse (when the satellite is in Earth's shadow).

#### 3. Attitude Control System (ACS):

- ACS maintains the satellite's orientation in space.
- Components include reaction wheels, magnetorquers, and thrusters.
- Star trackers help determine the satellite's position relative to stars.

#### 4. Communication Subsystem:

- Antennas receive and transmit signals to ground stations.
- Transceivers handle communication with mission control.

#### 5. Onboard Computer (OBC):

- The brain of the satellite, managing data processing, command execution, and telemetry.
- OBCs are radiation-hardened to withstand space conditions.

#### 6. Thermal Control System:

- Radiators, heat pipes, and insulation maintain optimal temperatures.
- Extreme temperature variations in space can affect electronics and materials.

## 7. Payload:

- The primary mission equipment carried by the satellite.
- Payloads vary widely: Earth observation cameras, scientific instruments, or technology demonstrations.

## 8. Deorbit System:

- Ensures controlled reentry at the end of the mission.
- Deorbit mechanisms include drag sails or propulsion systems.

## 9. Ground Data Systems and Mission Operations:

- Ground stations communicate with the satellite.
- Mission operators monitor and control the satellite from Earth.

## 10. Safety and Regulatory Components:

- Compliance with space debris mitigation guidelines.
- Beacon transmitters for tracking and identification.

