



Gujarat Technological University **School of Engineering and Technology**

“Report of the Online Meeting on Nano-Satellite Development”

Title: Online Meeting on Nano Satellite Development with Space Applications Centre (SAC), ISRO.

Date: 21st August, 2026

Co-ordinated by: Prof (Dr.) Gautam Makwana (Associate Professor, GTU-SET)

No. of Participants: 26

ISRO Nano Satellite Team, GTU School of Engineering and Technology (SET) Team and Students.

Organised By: GTU-School of Engineering and Technology

The following members were present in the meeting:

No	Member's Name, Designation and Affiliation	Position
1	Dr.Madhuri Bhavsar,GTU-SET ,Ahmedabad	Director
2	Dr. Rajesh Thakker, GTU, Ahmedabad	Director, RDC
3	Prof. Gautam D. Makwana, Associate Professor, GTU SET, Ahmedabad	Co- ordinator
4	Dr. Ritisha Bhatt, Assistant Professor , GTU-SET, Ahmedabad	Member
5	Miss Aayushi Garg , Assistant Professor, GTU-SET, Ahmedabad	Member
6	Mr Naimish Patel,SAC-ISRO, Ahmedabad	Scientist
7	Mr Ritesh Kumar Shama,SAC-ISRO, Ahmedabad	Scientist

Highlights of the meeting:

The session, delivered by Dr. Ritesh Kumar Sharma of the Space Applications Centre, ISRO, Ahmedabad, provided a comprehensive walkthrough of the nanosatellite development lifecycle, from mission concept to a flight-ready spacecraft. A central theme was the need to start with the mission rather than the hardware — defining the mission question, orbit, lifetime, coverage, and data volume before any subsystem design begins. The spacecraft architecture was presented as a fully integrated system spanning the payload, on-board computer, ADCS, power system, structure and thermal subsystems, and communications chain, all of which must clear their electrical, mechanical, thermal, data, and RF interfaces before integration can proceed. Each of the seven major subsystems — Payload, Structure and Mechanisms, Electrical Power System, Command and Data Handling, Attitude Determination and Control, Communications, and Thermal Control — was discussed individually along with its key design considerations and trade-offs, and the model philosophy of progressing from a breadboard prototype through a Design Verification Model and Qualification Model to the final Flight Model was highlighted as a way of retiring risk progressively.

Considerable emphasis was placed on a rigorous test and qualification program, including functional tests, vibration and shock testing, thermal-vacuum testing, EMI/EMC testing, and end-to-end mission simulation, all of which should be planned early rather than after hardware is built. The talk also traced the launch, deployment, and commissioning sequence, from the flight readiness review through establishing communications, stabilizing attitude, and finally commissioning the payload, and used an Earth-observation nanosatellite as a worked example of how mission requirements translate into concrete choices of payload, orbit, ADCS, and communications architecture. Six key engineering budgets — mass, power, data, RF, thermal, and pointing — were identified as the metrics that must be tracked throughout development to ensure the design converges toward a viable spacecraft. The session concluded with a recommended development philosophy: start small with a 1U or 3U platform, use modular interfaces, prototype early, design for testability and fault recovery from day one, and follow established CubeSat standards and launch-provider requirements. Both Dr. Ritesh Kumar Sharma and Mr. Naimish Patel explained the concepts, with Mr. Patel also addressing several questions raised during the discussion, adding further clarity on practical aspects of the topics covered.

