KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

Re-accredited by NAAC with A+ grade (4th cycle)

College of Excellence (UGC)

52nd Rank Among Colleges in NIRF 2024

G.N. Mills (PO), Coimbatore – 641029.

DEPARTMENT OF COMPUTER SCIENCE (AIDED)

Supported by

DBT STAR COLLEGE SCHEME

2024 - 2025

REPORT

Name of the Event	Visit to ISRO Satish Dhawan Space Centre (SDSC), SHAR, Sriharikota
Date	27.03.2025 to 29.03.2025
Place of Visit	ISRO Satish Dhawan Space Centre (SDSC), SHAR, Sriharikota
Objective of the Programme	To understand the space launch operations, explore technological innovations and learning about space missions.
Outcome of the Programme	The students came to know about cutting edge work of ISRO does in space science and technology, students gain insights into upcoming space missions such as Gagan yaan, and they felt the sense of National pride as they witness the achievements of ISRO in the global space community.
Number of Beneficiaries	Students : III B.Sc. Computer Science – 5 221CS006 – S.Thrishok 221CS024 – R.Srinath 221CS028 – A.Rahul 221CS051 – R.Prasanth 221CS059 – P.Mithun Faculty: 1 Dr.S.Radharani

Report in Detail

Our visit to the Indian Space Research Organisation (ISRO) was an insightful experience, offering us a deeper understanding of India's advancements in space exploration. We had the opportunity to visit several key facilities, including the Mission Control Centre (MCC), Launch Control Centre (LCC), Sounding Rocket Complex, First and Second Launch Pads, and facilities related to cryogenic propulsion (C25, C32) and rocket engines.

MISSION CONTROL CENTRE (MCC):

The Mission Control Centre (MCC) is the nerve center for all ISRO missions, responsible for tracking, monitoring, and managing launches and satellite operations. Equipped with advanced telemetry, tracking, and command (TTC) systems, MCC ensures real-time communication with rockets and satellites, monitors mission parameters, and analyzes flight trajectories to ensure mission success. We observed how MCC plays a crucial role in major missions like Chandrayaan, Mangalyaan, and Gaganyaan.

LAUNCH CONTROL CENTRE (LCC):

Next, we visited the Launch Control Centre (LCC), where ISRO scientists and engineers oversee launch operations. LCC is responsible for conducting pre-launch tests, monitoring the final countdown sequence, and authorizing the ignition and liftoff of rockets. It plays a critical role in ensuring that every launch is executed with precision and safety. The LCC works in close coordination with MCC to confirm mission readiness before liftoff.

SOUNDING ROCKET COMPLEX:

We also explored the Sounding Rocket Complex, where ISRO launches small suborbital rockets used for atmospheric and space research. Sounding rockets, such as those in the Rohini Sounding Rocket (RSR) series, help in testing new technologies before integrating them into larger launch vehicles like PSLV and GSLV. These rockets play a vital role in space physics and upper atmospheric studies.

LAUNCH PADS:

Our next stops were the First Launch Pad (FLP) and Second Launch Pad (SLP) at Sriharikota, which are used for launching PSLV, GSLV, and GSLV Mk III (LVM3) missions. The FLP supports horizontal integration, where the rocket is assembled in a vehicle assembly building and then transported to the launch pad. It is equipped with an integrated service tower (IST) for fueling and final checks. On the other hand, the SLP is designed for vertical integration, which allows for quicker and more efficient assembly of launch vehicles. The SLP is expected to support future human spaceflight missions like Gaganyaan.

ENGINE TECHNOLOGY:

We then learned about cryogenic propulsion, which is essential for high-thrust rockets. Cryogenic engines use liquid hydrogen (LH2) and liquid oxygen (LOX) as fuel, offering higher efficiency compared to conventional fuels. The C25 cryogenic stage, used in GSLV Mk III (LVM3), plays a crucial role in powering the upper stage of the rocket. It is powered by the CE-20 engine, which was developed by ISRO and has been used in missions like Chandrayaan-2, Chandrayaan-3, and Gaganyaan test flights. The C32 cryogenic stage was an earlier version used in previous GSLV models, but it has been replaced with the more efficient C25 stage for improved thrust and performance.

Additionally, we learned about rocket engines developed by ISRO. The Vikas engine, which is a liquid-fueled engine, powers the PSLV, GSLV, and GSLV Mk III rockets. It uses Unsymmetrical Dimethylhydrazine (UDMH) and Nitrogen Tetroxide (N2O4) as propellants. The CE-20 cryogenic engine, used in the C25 stage of GSLV Mk III, operates on LOX and LH2 and provides the necessary thrust for heavy-lift missions. We also learned about the SCE-200 semi-cryogenic engine, which is currently under development. This upcoming engine will use RP-1 (refined kerosene) and LOX, and it is expected to power ISRO's Next-Generation Launch Vehicles (NGLV).

Our visit to ISRO was an eye-opening experience, showcasing India's advancements in rocket technology, launch operations, and space exploration. It gave us a deeper appreciation for the efforts of ISRO scientists and engineers in making India a global leader in space research. The visit was both educational and inspiring, reinforcing the significance of India's ambitious missions like Gaganyaan, interplanetary exploration, and deep-space missions.

The ISRO visit provided us with a deeper understanding of rocket technology, launch operations, and space exploration**.** We gained insights into cryogenic propulsion, rocket engines and mission control systems**.** Observing the First and Second Launch Pads helped us understand rocket assembly and launch procedures**.** Learning about semi-cryogenic engines and upcoming missions gave us a glimpse into ISRO's future advancements**.** Overall, this visit was inspiring and enhanced our knowledge of India's space capabilities**.**