7.2.1: Describe two best practices successfully implemented by the Institution as per NAAC format provided in the Manual

BEST PRACTICE 1

Nano Sattelilte to Orbit/Nano Sattelite Mission

Unity Sat MOU on 25th Aug 2020:

Memorandum of Understanding signed on 25 th day of August 2020 between TSC Technologies Pvt Ltd, Bangalore, India, Committee for Space ProgrammeDevelopment ("CSPD"), Serbia, Indian Technology Congress Association(ITCA), Bangalore, India and Jeppiaar Institute Of Technology (JIT). This MoU represents an understanding of the Roles and Responsibilities of both the parties to progress the proposed Student Satellite Mission and provides an understanding by both the parties to worktogether to meet the objectives of all aspects of the Student Satellite Mission including training andassessment, mission identification, programme monitoring, structuring of institution project teams,development of subsystems, satellite assembly integration and test, deployer integration, coordination for regulatory approvals, satellite launch and deployment.

UnitySat Online Training Programme:

Online Training Programme for the development of UnitySat- JITsat was organized by TSC technologies in association with ITCA, CSPD- Serbia. Totally 16 sessions by eminent speakers has been organized and students actively participated and gained knowledge towards the development of Unity Sat- JIT Sat.

UnitySat Development:

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The UNITYSat is designed as a Joint Development by Jeppiaar Institute of Technology, Sunguvarchatram, Sriperumpudur (JITsat), G. H. Raisoni College of Engineering, Nagpur (GHRCEsat) and Sri Shakthi Institute of Engineering and Technology, Coimbatore (Sri Shakthi Sat) as a Technology Demonstration Mission for studying the indigenously developed satellite subsystems at LEO such as the On-Board Command, Data Handling System, the Electronic Power System and the Communication System. NHCE Students' start-up, TSC Technologies Pvt Ltd, Bangalore and Committee for Space Program Development (CSPD), Serbia has initially provided technical assistance for the teams of consortium of these three colleges mentioned above. The entire process is mentored by senior scientists superannuated from ISRO with their generous motivation/encouragement and the proactive support of the Industries, such as Alpha Design Technologies, Karnataka Hybrid Micro Devices Ltd, New Tech Solutions, Kepler Aerospace and Micropack Limited who have come forward to hand hold the teams and providing necessary special technical/expertise/services/clean rooms/testing facilities etc along with educating/mentoring the team members. This mission also intends to test the viability of the utilization of such systems in nanosatellite development. This satellite is developed as a 0.33U SlimSat that enables Universities and Colleges to develop fullfledged Satellite Systems with an affordable cost/lesser cost when compared to the typical systems that need to be imported from companies like EnduroSat, Pumpkin etc.

This SlimSat design, called UNITYSat is a 0.33U satellite that has the following general features:

- 100MHz, Power Efficient ARM Cortex M4 Processors x 2
- Latch-up Protections and Automatic Reset ICs
- Critical Data Storage: 2MB FRAM + 4MB MRAM
- Low Iq (Quiescent Current) wide Input Voltage Range Switching
- Batteries Voltages between 1.8V to 5.5V
- Power Rails Available: 3.3V and 5V
- Maximum Power Output of 15.75 W
- Frequency Range of 435 - 438 MHz

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- Output Power (dBm) of 30dBm
- Rx Sensitivity is -137 dBm
- Bandwidth of 125 kHz

The UNITYSat is also designed to study the application of LoRa modems for inter-satellite communication by transmitting satellite beacon signals and having the other satellites in the mesh act as a relay and eventually transmitting it to a ground station. It is also designed to operate on an open-source LoRa platform thereby giving access to anyone who wants to use it. The data will be encrypted but the key for decryption will be shared through the open-source platform called SatNOGS. This platform consists of hundreds of ground stations around the world. We are designing this satellite to be able to interact with all these stations. This mission also includes the development of an indigenous CubeSat deployment system that will help reduce the weight of the satellite deployer. This will drastically reduce the cost for launching such nanosatellites.

MISSION OBJECTIVE:

Primary Mission:

The UNITYSat is designed for it being a Technology Demonstration of Indigenously developed systems for nano satellite applications.

Secondary Mission:

- Experimental study of ultra-compact satellites in space environment
- Experimental LoRa Inter Satellite Communication
- Establishment of open-source satellite IoT network based on LoRa
- Testing indigenously developed CubeSatDeployer System

JIT Ground Station set up:

The Ground Station in JIT campus is named after Dr.KalpanaChawla, the first Indian origin woman went to space through a NASA Space Shuttle. Ground Station at JIT will receive and analyze data received from the Nano satellites and will be useful in space studies by both college and school students. The ground station lab has a well equipped set up with UHF-VHF antenna system, Clean Room, Antenna Rotator, Ground station, SDR, and software to track the satellite.

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MOU with ISRO on 22nd January 2021:

Consortium of Jeppiaar Institute of Technology, Chennai, GH Raisoni College of Engineering, Nagpur and Sri Shakthi Institute of Engineering & Technology, Coimbatore signed a MOU with Department of Space (DOS) for testing UNITYsat at URSC on 22nd January 2021.

JIT Ground station Virtual Inaguration on 28-01-2021:

Indian space research organisation (ISRO) Chairman Dr.K.Sivan virtually inaugurated the Dr.KalpanaChawla Nano Satellite research lab UNITYsat , JIT- SAT Ground Station on January 28th 2021 at Jeppiaar Institute of Technology. Dr.N.Marie Wilson, Managing Director, Dr K. Gopalakrishnan, UNITYsat consortium co-ordinator and Dr.L.M.Merlin Livingston, Principal graced the occasion with their esteemed presence.

UnitySat- JITSat Launch on 28th Feb 2021 :

Unity Sat JIT sat was handed over to ISRO after integration and testing process during first week of February 2021. The Unity sat - JITsat launch was scheduled on 28th Feb 2021 by PSLV C- 51. India National Space Promotion and Authorization Centre (IN-SPACe) launched by Prime Minister NarendraModi in June 2020 and ISRO has tremendously helped in the testing and integration of the satellite and for the whole success of the JITsat Mission. “While the Pico satellite weighs only about 460grms, it has the capacity to operate like other 10 kg Nano satellite. It is a low Earth orbit (LEO) satellite to be placed at the orbit 500-575 km above the sea level.

The PSLV C 51 was launched successfully in the predicted time stamp from ISRO Sriharikota. After the deployemnet of Amazonia- Brazil Satellite, UnitySat has been deployed into the orbit sucessfully at 12.19 PM. And the first satellite reception was received successfully over our partner ground station set up at CSPD- Serbia indicated healthy working condition of the satellite. The telemetry data were collected from the Unitysat when arriving at good pass over the horizon of the connected ground stations. All the data has been analysed and used for educational purpose like studying the data and frame formats and codes used for telemetry communication etc.

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"75 Student Satellites Mission 2022"

Commomerating 75th year of independence, "75 Student Satellites' Mission 2022" programme have been initiated to strengthen the science-based approach and experience-based learning among school and college students. Jeppiaar Institute of Technology is one among the institution Participating in the mission and the MOU has been signed between TSC Technologies and JIT on 21st Dec 2021. Student team is working on the project and soon we have the second JITSat launch.

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JEPPIAAR

INSTITUTE OF TECHNOLOGY

"Self Belief | Self Discipline | Self Respect"

DESIGN THINKING CLUB

"Design Thinking is a Mindset, not a toolkit or a series of steps"

DEPARTMENT OF INFORMATION TECHNOLOGY

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COLLEGE VISION

Jeppiaar Institute of Technology aspires to provide technical education in futuristic technologies with the perspective of innovative, industrial and social application for the betterment of humanity.

COLLEGE MISSION

- To produce competent and disciplined high-quality professionals with the practical skills necessary to excel as innovative professionals and entrepreneurs for the benefit of the society.
- To improve the quality of education through excellence in teaching and learning, research, leadership and by promoting the principles of scientific analysis, and creative thinking.
- To provide excellent infrastructure, serene and stimulating environment that is most conducive to learning.
- To strive for productive partnership between the Industry and the Institute for research and development in the emerging fields and creating opportunities for employability.
- To serve the global community by instilling ethics, values and life skills among the students needed to enrich their lives.

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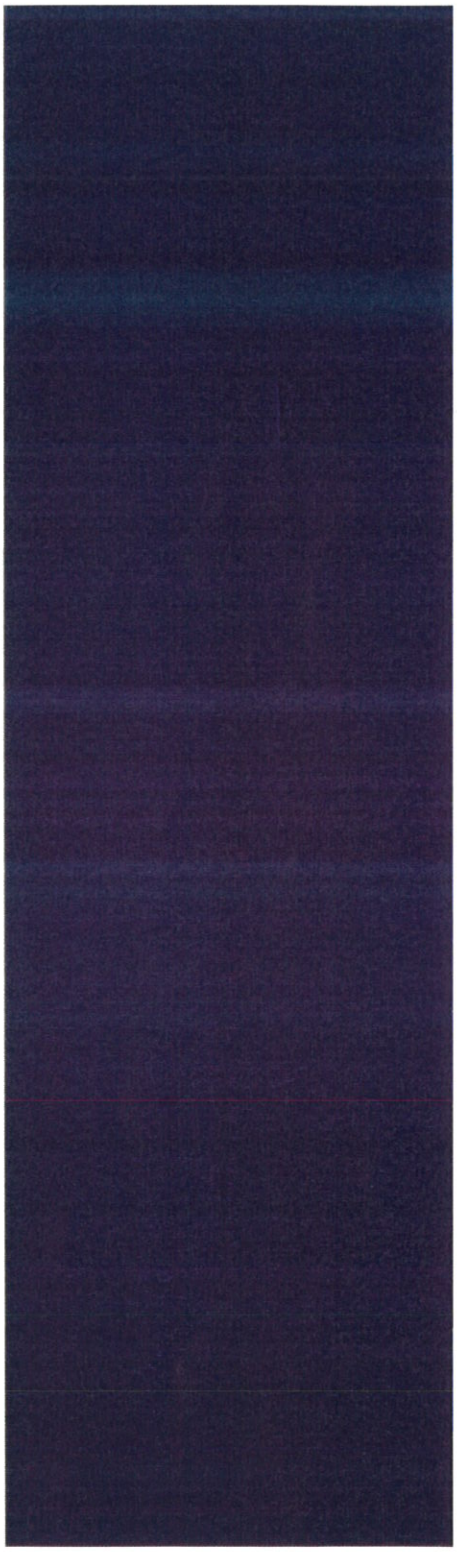

OBJECTIVE OF THE CLUB

- The club aims to technically strengthen the students by integrating their skills and ideas in the various fields of Engineering & technology, to cope up with the highly competitive environment.
- The activities of the club include:
  - Introductory Session
  - Awareness on Wireless Communications & its Applications
  - Guest Lectures
  - Workshops & Seminars

PREREQUISITE

A learner who wants to go ahead with this tutorial needs to have basic communication skills and also to idealate different ideas on various concepts of problems solving methodologies.

STAFF COORDINATORS

1. Mr.R.Devanathan, Assistant Professor, Placement Training
2. Ms.S,Scinthia Clarinda, Assistant Professor, Department of IT

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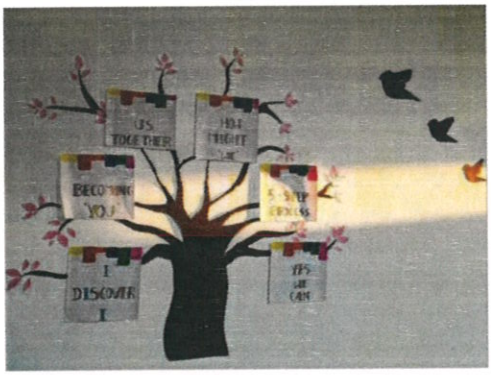
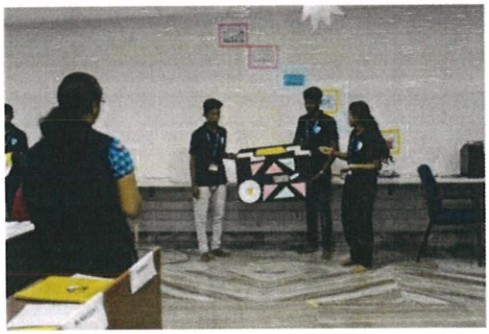
CLUB EVENTS

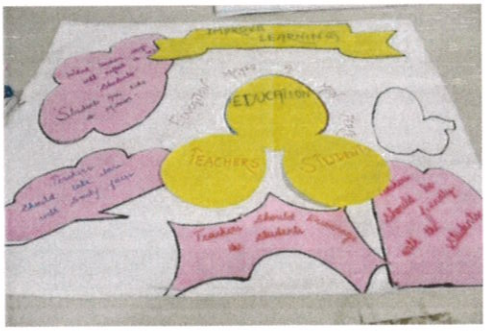
2019 - 2020

S.No	Date of The Event	Event Description	Number of Participants
1.	10.03.2020	An Introductory Session on **" DESIGN THINKING ".** The speakers for the session are: 1. Mr.R.Devanathan 2. Ms.S.Scinthia Clarinda	47

GALLERY







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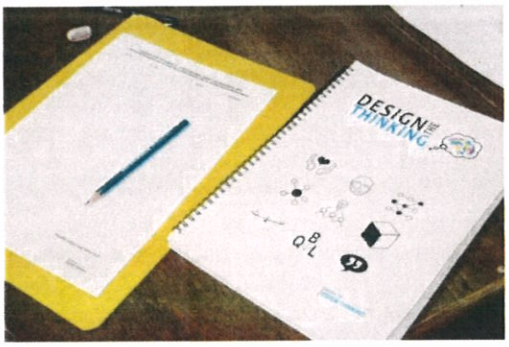
DESIGN THINKING CLUB



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