PRAVEGA - AEROMODELING CLUB

The Flying Journal

EDITION 5

DEPARTMENT OF AERONAUTICAL ENGINEERING

"Give your dreams new wings and let us make things fly"

In the idyllic spot of the SJCIT, the Department of Aeronautical Engineering was founded in 2014. NBA certification and affiliation, recognised as the finest department. The foundation of the aeronautical engineering programme is in-depth demonstration that impacts knowledge and ensures greater prospects for students no matter where they are in the world.

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Chickballapur

Sri Adichunchanagiri Shikshana Trust (R) was founded in the year 1974 under the divine leadership of his Holiness Byravaikya Sri Sri Sri Dr. Bala Gangadharanatha Maha Swamiji.

Sri Adichunchanagiri Mahasamsthana Mutt, with its roots firmly embedded in the folds of time (1500 Years), Space on Rocky hill, 63 miles west of Bangalore, the Capital City of Karnataka, has been working towards the betterment of human life and society.

Sri Jagadguru Chandrashekharanatha Swamiji Institute of Technology (SJCIT) is affiliated to the Visvesvarya Technological university and was established in 1986 with the objective of developing a standard institution offering engineering courses its main aim is to produce abled engineers to develop the nation and world.

Beginning with the potential of excellence we are Accredited by NAAC (A+), NBA & ISO certified where we try for better and improvised quality education from our auditors.

A premier institute imparting technical education since 1986 The college is situated on Bangalore-Hyderabad National Highway NH7, 45 kms from Bangalore city about, 20 kms from Kempe Gowda International Airport and about 5 kms from Muddenahalli, the birth place of Sir M Visvesvaraya. The famous hill resort Nandi hill is about 15 kms from the college.

Dr.G.T. Raju

Principal

SJC Institute of Technology

MESSAGE

I am very happy that the Department of Aeronautical Engineering has come out with the department newsletter for the year 2023 and the fifth edition of "The Flying Journal". I am proud of the achievements of Staff and students towards the development of the Department and the Institute. Would like to see our students working in renowned companies where they will explore much more and make us proud at each level in future.

Dr. Deepa M S

Professor and Head

Department of AERONAUTICAL ENGINEERING

I am extremely happy and overwhelmed at the interest and participation of our 4th Sem students of the Department of Aeronautical Engineering in continuing out this exceptional newsletter. It is indeed a great pride and honour to launch the Fifth Edition of the Newsletter- "The Flying Journal" for 2022-23.

I wholeheartedly thank the editorial team for this edition of Newsletter "The Flying Journal" and wish them Good Luck.

EDITORIAL TEAM

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Professor & Head

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ALUMNI TALKS

Alumni Talks is a program organized by the department, where the passed out alumni's from the Aeronautical Department, SJCIT. who are successful in their career gives brief information on the industry recruitments, this program is conducted once in a month.

1). Hidayath Ulla

Mr. Hidayath Ulla is working as Assistant Structures Engineer in Bangalore aircraft industries Pvt. Ltd. And is an alumnus from batch (2016-2020) from the Aeronautical Engineering, SJCIT.

On 18th March 2023 he gave a brief discussion on career opportunities in Aeronautical Engineering to the students.

2). Akshay Raj N

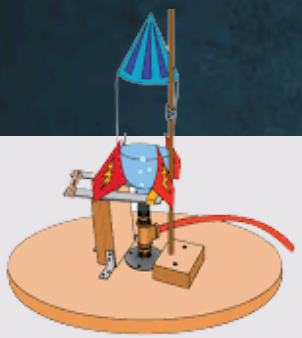
Mr. Akshay Raj N is working as CFD (computational fluid dynamics) Engineer at Quest Global and he is proud alumnus from batch (2014-2018)

On 8th April 2023 he gave a brief information about the scope of Computational Fluid Dynamics in engineering. which is emerging trend in today's market. It provides useful information on the underlying transport phenomena in chemical and biochemical processes and industrial uses of CFD.

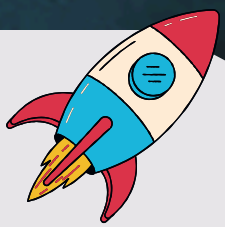
3). Durga Prasad

Mr. Durga Prasad N S is working as Graduate Engineer Trainee at Magellan Aerospace Pvt., Ltd., He is alumnus from batch(2018-2022)

On 10th June 2023 he gave a brief discussion on gaining first hand insight into the manufacturing industry this insight into modern manufacturing explores these two aspects. That how many companies formed in the first place and about product concept. He gave an overview about knowing them what are software that students should work on, which helps them during placements.



SEED ACTIVITY



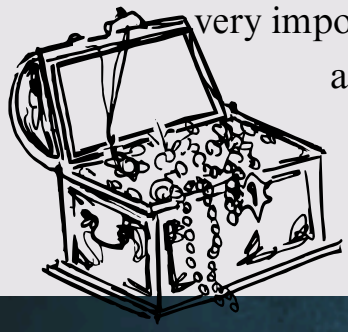
1) Hydro Rocket

The water rocket system consists of two main parts, the launcher and the rocket. The rocket is made from a 2-liter pep bottle. Before launch, the bottle is filled with adequate calculated amount of water, which acts as the "propellant" for the launch. A hollow launch tube is mounted perpendicular to the base and is inserted into the base of the rocket before launch. The launch tube is connected to an air pump. The pump is used to pressurize the inside of the body tube to provide thrust for the rocket.

2) Treasure Hunt

Department has conducted Student Excellence and Empowerment Development (SEED) activity on Technical Treasure Hunt and few other games on 24th June 2023.

One of the interesting activity, students are made into groups and each group is given a set of technical questions as clue and by solving those clues students has to find the hidden things. Another day seed activity was conducted by MBA students in our department on a concept of team building many games were included in this namely balloon balance, tik tok toe, thread remover etc.. as this games are very important in students life and helps them to build and participate in team building and how important are they in future.



VISITS

1) HAL Heritage Centre

Hindustan Aeronautics Limited (HAL) Heritage Centre and Aerospace Meseum Banglore , the first of its kind in India established in 2001, is situated at the intersection of HAL old Airport & Basavanagar road and it is about 17 kms from the Bengaluru city railway station . the Heritage centre & Aerospace museum is sprawled over 4 acres of lush green land .There are two major halls, one displaying the photographs that chart the growth of aviation in each decade from 1940 till date and a Hall of Fame that takes the visitors on an exciting journey through the Heritage of Aerospace & Aviation Industry in India.

The second Hall highlights the various functions of an Aero Engine by displaying motorized cross sections of various models of Aero Engines. Real Engines such as Garret (for Dornier Aircraft), Adour (for Jaguar Aircraft) and Orpheus (for Kiran Aircraft) can be seen here along with Ejection Seat with Parachute; and Pushpak & Basant Aircraft.

2) AeroDef Expo 2023

AeroDef Manufacturing is an aerospace and defense manufacturing conference and trade show for the aerospace and defense manufacturing industry.

Aerodef India was held on 16th November 2023 at the Bangalore International Exhibition Center (BIEC). AeroDef India is an exclusive platform for Indian and international aerospace and defence equipment manufacturers to source raw material, components, sub assemblies and finished products and sub contract essential manufacturing processes like forging, machining, moulding, finishing, material development etc to Indian MSME'S.

3) U R Rao Satellite Centre

U R Rao Satellite Center (URSC), Bengaluru, the students of Aeronautical Engineering visited ISRO on 2nd December 2022, URSC formerly known as ISRO Satellite Centre is the lead centre for building satellites and developing associate satellite technologies.

These spacecraft are used for providing application to various users in the area of Communication, Navigation, Meteorology, Remote Sensing , Space Science and interplanetary explorations. The center is also pursuing advanced technologies for future mission. URSC is housed with the state-of-the-art facilities for building satellites on the end-to-end basis. ISRO Satellite Integration and Test Establishment (ISITE) is equipped with state of-the-art clean room facilities for spacecraft integration and test facilities including a 6.5metre thermos vacuum chamber, 29 Ton vibration facility.

4) Airshow 2023

Aero India is a biennial air show and aviation exhibition held in Bengaluru, at the Yelahanka Air Force Station. It is organised by the Defence Exhibition Organisation, Ministry of Defence.

The Defence Ministry of India, Indian Air Force, Hindustan Aeronautics Limited Defence Research and Development Organisation (DRDO), Department of Space, the Union Civil Aviation Ministry and other such organisations organise the Aero India show.

5) Raxa Academy

RAXA Academy was established in 2007 and is located near Hindupur on Bengaluru – Hyderabad National Highway (NH-44), about 80 km away from Bengaluru's Kempegowda International Airport. It is spread across 100 acres amidst sprawling meadows. The best-in-class training and administrative infrastructure has been designed aesthetically with modern amenities to cater to the needs of multitudes of trainees seeking an invigorating and rejuvenating training experience. RAXA Academy has now been transformed as a 2016 "Centre for Higher Learning in Security" and several short duration thematic courses are being conducted at the Academy on a regular basis for senior professionals in the field of Security.

RAXA Academy is accredited with National Skill Development Corporation (NSDC) and affiliated with the Management and Entrepreneurship and Professional Skills Council (MEPSC) .

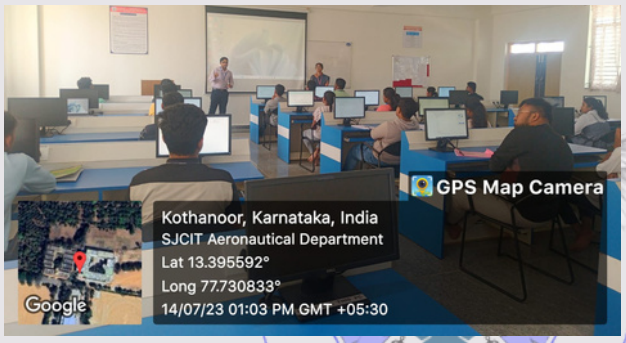
We Visited RAXA Academy as a part of Industrial Visit. It started with a presentation explaining about the academy. Then we visited the lab where the Drone components like Drone frame, Battery, ESC, FC, & transmitter etc.. then hey explained about the materials used for different parts.

After the Lab Visit went to the ground for Drone flying and learned the Drone mapping and Drone control Surfaces Control through Simulator.

WORKSHOPS CONDUCTED

1) Python

The Department of Aeronautical Engineering in association with Indoskill team, conducted workshop on python which provided a knowledge on python programming through AQMENZ AUTOMATION PVT LTD (AAPL) for 4 days. This was a training workshop on the application of python in Aeronautical Industries provided by the Department of Aeronautical Engineering for 4th Semester students as part of their Ability Enhancement Course. This workshop was organized to bridge the gap between the industry-academia and provide a platform& exposure to the need of the industry.



2) Application of Excel in Aeronautical Industry

The Department of Aeronautical Engineering in association with HRD, SJCIT conducted workshop on Excel which provided a hands-on session on MS Excel through Bizotic Talent Solutions Private Limited for 4 days. This was a training workshop on the application of Excel in Aeronautical Industries provided by the Department of Aeronautical Engineering for 6th-semester students.

This workshop will and bridge the gap between the industry-academia and provide a platform & exposure to the need of the industry.

Objectives:

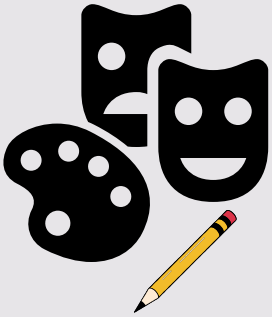
- To familiarize the students with the basics of MS Excel for internship opportunities in Aeronautical industries.
- To enable students to format, organize and calculate data in a spreadsheet.
- To focus on data arrangement, formatting, functions, formula, and many more.

STUDENT ACHIVEMENTS

The 46th series of this programme, which was organised by the Karnataka State Council for Science and Technology (KSCST) and financed 1,230 projects from 170 colleges, gave us the chance to present our project to the council. "Aerodynamic Analysis of Daimond Shape Airfoil at Supersonic Speed" was the project's name.

The project work titled “AERODYNAMIC ANALYSIS, FABRICATION AND TESTING OF DIAMOND SHAPE AIRFOIL AT SUPERSONIC SPEED”. Which is a final year student major project was funded by Karnataka State Council for Science and Technology (KSCST) during 46th series of students programme during the AY: 2022-2023, Project Proposal Reference No: 46S_BE_0382 and the amount is of Rs. 6000/- which was sanctioned for the fulfilment of the project

This project is carried out by Mr.MUZAMMIL PASHA S B (1SJ19AE015), Mr. MANJUNATH J (1SJ19AE012), Ms DIVYASHREE N (1SJ19AE005) and Ms SENAGASETTY DURGA DADEEPYA. (1SJ19AE024) are the bonafied students of SJC Institute of Technology Chickballapur under the guidance of Prof. Vidyashree K.R. Assistant Professor Department of Aeronautical Engineering.



Art By:

B M Vinayaka
4th Sem, AE

WORKSHOP ATTENDED

1) 7 Days Skill Development Program

Idea to prototype building is a 7 days student skilling program conducted on 22nd to 28th February 2023 which is useful to students to get ideas on how to build a prototype.

This was organised by AICTE idea lab SJCIT.

The session was about embedded systems and explained use of few softwares like Arduino,kicad,tinkercad etc. & internet of things (IOT) and explained how to use tinkercad to run a program and few projects and students worked on home automation and soil sensor by using IOT.

PCB (printed circuit board)explained how electrical circuits constructed and printed students also constructed few circuits with different components, importance of pcb in building prototype.

2) GIAN Course

The GIAN (Global initiative of Acadamic Networks) course on INDUSTRIAL AND VEHICLE AERODYNAMICS:-"A New Frontier for India's Economic Prosperity, Energy Security and Sustainable Environment" from 28th Aug - 2nd Sep 2023 held at Motilal Nehru National Institute Of Technology Allahabad, Prayagraj, Uttar Pradesh, India. Gobal Initiative of Academic Network(Gian) organised by Ministry of Education.

By prof. Firoz Alam RMIT University, Australia on overview of Industrial and Vehicle aerodynamics and prof. Arnab Roy Dept. of aerospace engineering IIT Kharagpur on CFD Analysis.

Chandrayaan-3

Chandrayaan-3 is a follow-on mission to Chandrayaan-2 to demonstrate end-to-end capability in safe landing and roving on the lunar surface. It consists of Lander and Rover configuration. It will be launched by LVM3 from SDSC SHAR, Sriharikota. The propulsion module will carry the lander and rover configuration till 100 km lunar orbit. The propulsion module has Spectro-polarimetry of Habitable Planet Earth (SHAPE) payload to study the spectral and Polari metric measurements of Earth from the lunar orbit.

Chandrayaan-3 consists of an indigenous Lander module (LM), Propulsion module (PM) and a Rover with an objective of developing and demonstrating new technologies required for Inter planetary missions. The Lander will have the capability to soft land at a specified lunar site and deploy the Rover which will carry out in-situ chemical analysis of the lunar surface during the course of its mobility. The Lander and the Rover have scientific payloads to carry out experiments on the lunar surface. Apart from this, the Propulsion Module also has one scientific payload as a value addition which will be operated post separation of Lander Module. The launcher identified for Chandrayaan-3 is LVM3 M4 which will place the integrated module in an Elliptic Parking Orbit (EPO) of size ~170 x 36500 km.

The mission objectives of Chandrayaan-3 are:

•To demonstrate Safe and Soft Landing on Lunar Surface.

•To demonstrate Rover roving on the moon.

•To conduct in-situ scientific experiments.

To achieve the mission objectives, several advanced technologies are present in Lander such as,

• Altimeters: Laser & RF based Altimeters

• Velocimeters: Laser Doppler Velocimeter & Lander Horizontal Velocity Camera.

• Inertial Measurement: Laser Gyro based Inertial referencing and Accelerometer package.

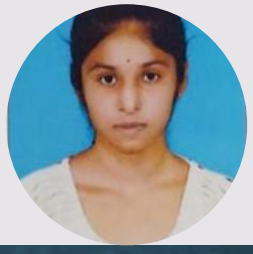
• PropulsionSystem:800N Throttleable Liquid Engines, 58N attitude thrusters & Throttleable Engine Control Electronics

•Navigation, Guidance & Control (NGC): Powered Descent Trajectory design and associate software elements

•Hazard Detection and Avoidance: Lander Hazard Detection & Avoidance Camera and Processing Algorithm

• Landing Leg Mechanism.

Source:-http://www.isro.gov.in



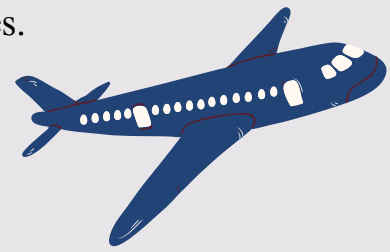
Jhansi V
4th Sem, AE

HYDROGEN AIRCRAFT

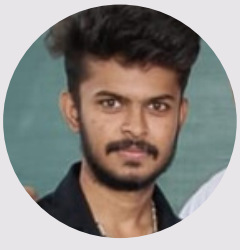
A Hydrogen Aircraft is an airplane that makes use of hydrogen (liquid or gas) as a power source. hydrogen energy can be harnessed in two ways for a hydrogen aircraft. It can either be burned in a jet engine or other sorts of internal combustion engines or it can be used to power a fuel cell to generate electricity to power propeller of aircraft.

Hydrogen (in gaseous form) is usually extracted from water by the electrolysis process, which includes passing is quit expensive as it includes high expenditure on energy requirements as well as for fuel management and storage on board aircraft.

The aerospace industry continuous to develop technology to build the worlds first zero emission commercial aircraft by 2035. Green hydrogen is one of the most recent development in aviation fuel, which has been an essential component of net-zero climate strategies. for the aviation industry, green hydrogen is expected to play a key role in as fuel in future aircraft. thus, aviation authorities across the world are increasing investments in green hydrogen as it is an essential component for net-zero climate strategies.



If hydrogen is available in quantity from low-carbon power such as wind or nuclear, its use in aircraft will produce fewer greenhouse gases than current aircraft: water vapor and a small amount of nitrogen oxide. Currently very little hydrogen is produced using low-carbon energy sources. Hydrogen combustion produces up to 90% less nitrogen oxides than kerosene fuel.



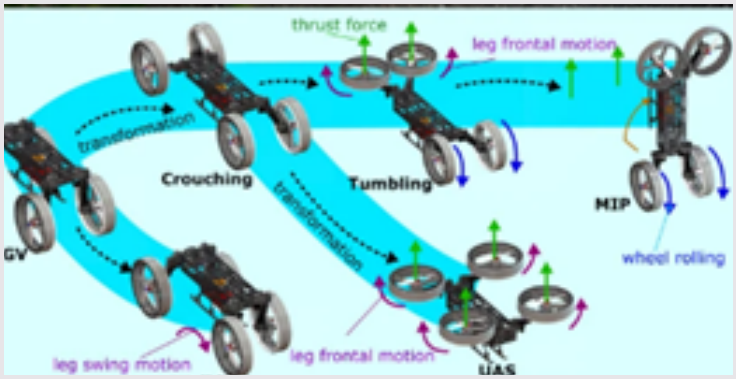
Nayan Kumar K J
4th Sem, AE

Multi-Modal Mobility Morphobot

The Multi-Modal mobility Morphobot is of the art robotic vehicle that combines the benefits of multiple transportation modes into one effect and versatile machine. By seamlessly morphing between different configurations and adapting to various terrains and environment this advanced mobility solution aims to address the challenges of congestion pollution and limited infrastructure.

• Versatility: The Morphobot can transform itself to accommodate different transportation modes such as a car motorcycle a bicycle or a flying drone. This adaptability allows users to easily switch between different modes based on their preference's local regulations or specific travel requirements.

•Sustainable and Eco-Friendly: With growing concerns about carbon emissions the Multi-Modal Morphobot is designed to be eco-friendly. It offers electric and hybrid propulsion system reducing its carbon footprint and contributing to cleaner air quality in urban areas.



• Intelligent Navigator: Equipped with advanced sensors artificial intelligence and machine learning capabilities the Morphobot can autonomously navigate through various terrains and traffic scenarios. It can optimize routes to minimize travel time and avoid congested areas ensuring a smooth and efficient commute.

• Seamless Connectivity: The Morphobot is fully integrated with smart city infrastructure and internet of Things (IoT) networks. It can communicate with traffic management systems other vehicles and pedestrians enabling safe and coordinated transportation.

While the Multi-Modal Mobility Morphobot is still in the development and testing phase industry experts believe that this revolutionary technology could be a game-changer in the near future. As we look towards a more connected and sustainable world this innovative solution offers a glimpse into the future.

B M Kruthik
4th Sem, AE

NSS ACTIVITY

National Social Service(NSS) is the part of our academic, social and personal lives. It enabled students to actively offer their time and talents to the betterment of their society NSS provides students to become involved in real life social activites. Under this activity our students have participated in cleaning, plantation, and blood donation camp etc. Awareness program have been conducted by our students to government school students as part of this students addressed our college and about the department and few activities were conducted like Hydrorocket competition, team building activites etc.. And also they educated students about the future courses specially after 10th by PowerPoint presentations.

Hydrorocket competition was conducted in groups and each group was coordinated by our students they helped them to build the hydro rocket models. The team building games are interactive activities designed to faster the collaboration, strengthen bonds and understanding among team members.

VISION

Preparing Competent Aeronautical Engineers to Serve the Society

MISSION

- Strengthening the Fundamental concepts in Aeronautical Engineering.
- Building Analytical ability among students with innovative problem-solving techniques.
- Training students in multidisciplinary research areas in collaboration with Industries embedding the culture of continuous learning.
- Imparting skill-set in line with emerging industrial needs with leadership qualities.
- Making students responsible citizens to serve society with ethics and values.

Department of Aeronautical Engineering

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