

VOLUME 2 ISSUE 2

MILES TO NAUTS

FEB 2023



KUMARAGURU
college of technology
character is life



Aeromodelling Club
Kumaraguru College of Technology

**INNOVATION
BOOM SUPERSONIC
& SUPERSONIC UAV**

**KNOW ABOUT
THE HISTORY OF
INDIAN AIR FORCE**

**TECH BONUS !
FUN FACTS
ABOUT AVIATION FIELD**

**LIFE AND SCIENCE
VISCOSITY
IN DAY TO DAY LIFE**

**AMELIA EARHART
AVIATION PIONEER
ICON OF THE MONTH**

**INTERVIEW
WITH PILOT
Mr. RAVISH BHALLA**

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ICON OF THE MONTH

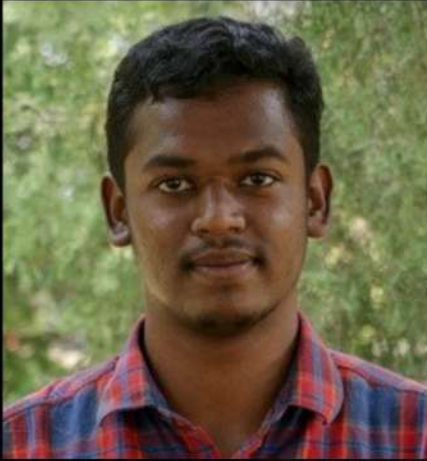
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EDITOR'S NOTE

Mr. Martin N,

UG Second year, Department of Aeronautical engineering

Dear Readers,

I'm very much delighted and privileged to have made our magazine, "MILES TO NAUTS" reach your hands. Me and every single member of my team have worked hard and at the same time witnessed some extraordinary experiences while putting this magazine together. Our magazine is the brainchild of students who are so passionate about aerospace and dream to create a niche for themselves in this challenging yet fascinating field. The magazine aspires to create a connection between what the individuals study and what they practise.

In this issue, we have put together facts, experiences and information that will definitely benefit anyone who flips the pages. The magazine aims at quenching the intellectual thirst for anyone who is trying to constantly educate themselves and to motivate them to strive towards excellence. We hope and believe that you would be as thrilled and excited as we were while working on this magazine and constantly render your support through your constructive criticisms and continued readership.

Hope to see you soon,
Martin N, Editor.



History of IAF

WORLD WAR - 2



The Indian Air Force's history goes back to 1932 and continues up to the present day. The IAF played an instrumental role in handling the advance of the Japanese army in Burma, where the first IAF air strike was executed. The target of this first mission in Burma was the Japanese military base in Arakan, after which IAF strike missions continued against the Japanese air bases at Mae Hong Son, Chiang Mai, and Chiang Rai in northern Thailand.

The IAF was mainly involved in the strike, close air support, aerial reconnaissance, bomber escort, and pathfinding missions for Royal Air Force and US Air Force heavy bombers. During the war, the IAF expanded in a steady manner. New aircraft added to the fleet included the US-built Vultee Vengeance, Douglas Dakota,

the British Hawker Hurricane, Supermarine Spitfire, and Westland Lysander. The IAF in Burma operated in the tactical role, conducting the reconnaissance, ground-attack, and army co-operation missions in support of the 14th Army from September 1943. IAF squadrons fought alongside the RAF throughout the campaign and a typical Indian unit might include Hindus, Sikhs, Muslims, and Christians as well as seconded British airmen.

In 1945, King George VI conferred IAF with the prefix "Royal" in recognition of the valiant service. Since then, the IAF was referred to as the Royal Indian Air Force. In 1950, when India became a republic, the prefix was dropped and it reverted to being the Indian Air Force.





KARGIL WAR

On 11th, May during the Kargil War, the Indian Army called Indian Air Force to give support from the strike, by the name of code called Operation Safed Sagar.

The first strike was launched on May 26, 1999 along with MiG-27, MiG-21, and MiG-29.

The IAF deployed its radars and MiG-29 fighter jets in large numbers to keep a check on Pakistani military movements across the border. At that time, Srinagar Airport was closed to civilians and dedicated to IAF.

Once India regained control of the hills in Kargil overlooking NH 1, the Indian Army went on to drive the invading Pakistani army back across the LOC. On 27th May, IAF lost its MiG-21, MiG-27, and MiG-17 by the Pakistani missiles, and the entire crew was dead.



THE OXYGEN IN AN AIRPLANE'S EMERGENCY OXYGEN MASKS LASTS FOR ONLY ABOUT 15 MINUTES.

DID YOU KNOW?



The IAF withdrew helicopters and on 30th May, Mirage 2000 was introduced. It gave IAF the ability to carry out aerial raids at night rather than others. MiG 29 was used extensively to give fighter escorts to Mirage 2000. The Mirages successfully targeted enemy camps and by 26 July, the Indian forces had successfully repulsed the Pakistani forces from Kargil.

ICON OF THE MONTH

AMELIA EARHART

EARLY LIFE

Born during a time when girls were expected to wear dresses and do womanly chores all day, Amelia hated the conventional way of upbringing. Her mother shared similar thoughts on the matter and always planned fun adventures for her girls, paving the way for Amelia to become the aviation pioneer she is known as today.

Amelia Earhart was born to Samuel and Amelia Earhart on the 24th of July 1897 in Kansas, United States. She was very much interested in exploring things as a child, so much so that she built a roller coaster at the age of 7. She was twelve when she saw an airplane for the first time and twenty two when she first flew on one.

While this sounds glamorous considering she was born in the 19th century, her childhood couldn't have been more troublesome.



Her grandmother, who had raised her and her sister, died when she was 13. That led to the auctioning of the house the children were living in, forcing the kids out of the house and to make matters worse, her parents got divorced in 1924. In spite of all of this she completed her schooling and graduated from Columbia University, in a course, in medical studies and went on to work at the Spadina military

hospital only to quit a year later to spend time with her parents. While there her dad took her to meet Frank Hawks, a famous air-racer who gave Amelia her first ride on an airplane. It was on the 28th of December 1920, the flight lasted about 10 minutes, and it cost her dad about 10 dollars, but it was that 10 minutes that made her realize what she wanted to do for the rest of her life.

Determined to fly the plane by herself, she worked as a photographer, a truck driver and, a stenographer, all the while saving money for her flying lessons. On 3rd, January 1921 her dreams started coming true because, it was on that day, she got her first flying lesson from the renowned Anita Snook. She worked hard to get accustomed to the rudimentary environment required for aviation training. She cut her hair like the then female aviators and prepared for her role. Sadly her father died in 1932 fighting alcoholism.

ACHIEVEMENTS

On 22nd, October 1922 Earhart broke the record for female aviators by flying at an altitude of 14,000 feet. On 15th, May 1923 she became the 16th woman to get a pilot license. On 17th, June 1928 she became the first woman to fly across the Atlantic as a passenger. In 1929 she was elected as an official for the national aeronautics association. In 1929, she helped in founding the Ninety Nines (founded by 99 women pilots) for the advancement of female pilots.



In September 1930, she became the vice president of a new airline, "Washington Airways". On 20th, May 1932 she became the first woman and the second person in the whole world to fly solo across the Atlantic, for which the government of the United States awarded her the distinguished flying cross medal. She set the women's transcontinental speed record by flying 2447.8 miles in 19 hours on 24th, August 1932.

DEMISE

On June, 1st 1937 Earhart, started her second attempt to fly around the entire world and was accompanied by flight navigator Fred Noonan. She started her flight from Oakland, California and during the course of the flight, she set a record by crossing the red sea and reaching India. By June 29, they had reached Lao, New Guinea and left on July 2nd for the next refuelling stop and, that was the last time both Earhart and Noonan were seen alive before they lost radio contact with the coast guard and disappeared forever.

THE LOCKHEED SR-71
BLACKBIRD IS THE FASTEST
MANNED JET AIRCRAFT IN
THE WORLD.

DID YOU KNOW?



First woman and the
second person in the
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Earhart broke the
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INNOVATION IN AVIATION

BOOM SUPERSONIC

24th, October 2003, is considered a remarkable day in the history of aviation because it marked an end to commercial supersonic flights. On that day, Concorde, the supersonic airliner made its last commercial flight from London Heathrow to New York City. Now almost twenty years later, the supersonic dream might come true. New technological advancements are allowing various designs to succeed where Concorde failed and a variety of companies and research institutes are heavily investing on a new generation of civilian supersonic aircraft.

Boom Supersonic, the aerospace company which is attempting to create the world's fastest and most sustainable commercial supersonic airliner, announced a strategic investment from American Express Ventures. These funds will support the continued development of Boom's flagship product, the supersonic airliner Overture.

Boom's Overture is a planned 65-88-seat supersonic airliner capable of running on 100% sustainable aviation fuel. The supersonic aircraft is said to roll out in the year 2025 and start commercial flights by 2029. The corporate says Overture will fly twice as fast as conventional jets over quite 500 transoceanic routes worldwide. Boom currently has 6 billion dollars in pre-orders of Overture aircraft



Boom aims to "remove barriers in experiencing the Earth" claims, Durrence. Boom's flights will be between coastal cities because the overwater flight is big and profitable. It is on such long routes that speed matters the most.

**COMMERCIAL PASSENGER
JETS USUALLY CRUISE AT
A SPEED AVERAGING 885
TO 933 KILOMETERS PER
HOUR**

DID YOU KNOW ?



SUPERSONIC UAV

The Singapore based Aviation Company Kelley Aerospace has unveiled the supersonic UAV. It is the world's first supersonic Unmanned Combat Aerial Vehicle (UCAV) named "Arrow". The UCAV is capable of flying faster than the speed of sound. For the past three decades, UAVs in warfare have grown immensely. All the countries initiated to focus on aerial vehicles for military and combat purposes. The supersonic Arrow is an unbelievably cool piece of tech. It is vitally important that we keep in mind the context in which it will be used and the ultimate purpose it serves as a weapon of war. It is mainly used for intelligence, surveillance, target acquisition and reconnaissance tasks. This drone features a monocoque (literally single-shell) built from carbon fiber, which enables it to be lightweight enough to fly more than 2,600 Nm (4,800 km) with a maximum weight of 16,800kg. The manned fighter jets can control multiple Arrow drones each, equipped with a different mission and weapon set.



The drone can be launched either autonomously or can be remotely controlled by two ground station controllers. It's stealthy enough to go undetected on enemy radars. These drones are capable of flying more than 2,600 nautical miles per hour at 1611 miles per hour. For example, the drone can fly from Los Angeles to Tokyo in a little over three hours.

It is designed futuristic with reduced radar cross-section and infra-red signature. The Arrow has outstanding strength and stiffness owing to its carbon fiber and monocoque design. Many prospective customers are likely interested in the drone's potential to give combatants a creepy, fast, carbon-fiber-lightweight edge in warfare. This drone creates a great impact on the field of drone technology and enhances aviation to the next stage.

INTERVIEW WITH PILOT

Mr. Ravish Bhalla



People say that travel teaches you a lot about the world. You have traveled around different places and met new people. What are the learnings you got from meeting different people from different cultures?

When you travel to different places and meet new people you will get exposed to new culture and language which is a very good thing. When I was a very young kid in 2002, I was in Assam where power cut is very often that time. People have ponds outside their houses. At that time people there used to do fishing in the pond till the power comes again. It was very new and different to me as I have not seen anything like that before. And I feel that I was very lucky to have such kind of experience. That kind of exposure makes me adapt to different places and situations very easily.

"Exposed to new culture and language is a very good thing"

As you said you are the 8th pilot from your family, how did you cope up with the pressure of becoming the best pilot? Do you consider this as a boon or bane?

As I belong to a family where everyone is from an aviation background, I was a little pressurized because I must not put the family's name down. Even if there is a group discussion in my family it will be mostly related to aviation and if you are a part of the discussion, then you need to know what is happening. So, I learned a lot from them and books. They guided me to get my CPL (Commercial Pilot License). I was privileged that I am from an aviation family. But after that, I was supposed to do everything on my own to achieve success. So, I consider this as both boon and bane.

After you got a conference out on SSB (Services Selection Board), you went to pursue your love for theatre. It seems to be a roller coaster ride. How did you cope up with the failures and got your back? What was your motivation that kept you running all the while?

Whenever you get rejected by something it is okay to be sad for you to accept that failure. Once you accept that failure, you can learn from that failure and convert that into lessons. When I got a conference out from the SSB, I was able to realize the flaws I made there. I learned a lot from the mistakes I have done there. And I will say it is an upliftment stone in my life that prevents me from doing mistakes now. That constant reminder in my mind keeps me grounded and makes me do things better. We must accept those failures and move forward.

Your Nana Ji played a vital role in your aviation career. After getting his advice you decided to give one more shot. Having very little time in hand, how did you prepare for DGCA (Directorate General of Civil Aviation)?

Yes, I got very little time as it was already very late, and I was in a do-or-die situation. I would like to thank my parents here for everything they have done for me. They motivated me to do whatever I wanted to do and that is the thing that never let me down. Academically I was not a great student, but I like to study aviation. I got a lot of interest in the navigation systems, the instrumentations in the flight, and the mechanisms in it. I was very clear that on this day of 2019, I should have a job. So, every day was accounted for. That made me clear my DGCA exams in the very first attempt itself. Also, I got a clear vision of my goal of becoming a pilot. That very little time helped me a lot to achieve my success.

You have been a cricketer, a basketball player. You tried being an IT employee, a businessman, a theatre artist. It seems that you have given a shot for everything you felt like pursuing. Similarly, there are many students out there who do not know what they need and have so many options as a career. Do you think that trial and error methods like this will lead us to success?

People are lucky if they can choose the path they are going to follow. But if they are not sure about the path, it is better to check what they are good at. Even I was not sure with mine and I have done the same thing. But I had no "what ifs" in my life, like what if I could do this or that. The only fear is jumping into the swimming pool. Once you are into the water you are just part of the wave. Just jump in and do what you wanted to do. Do not have that "what ifs" in your life. So, it is good to have that trial-and-error method in your life if you do not have an idea of what to do.

"The only fear is jumping into the swimming pool. Once you are into the water you are just part of the wave"

When you flew the aircraft for the first time and when you got CPL after 200 hours of flying, what was your feeling, and how was the experience?

I always wanted to fly a fighter plane. When I sat in the cockpit of a propeller plane for the first time, I thought I will be excited, but I got no feeling of that butterflies flying inside. I got no jitters. But when I started flying regularly, I went to cross-countries. When I was about to complete my 200 hours of flying, I sensed that I achieved something on my own. That was a milestone that made me sense achievement.

Can you share with us one nail-biting or thrilling moment which you could never forget as a pilot?

While I was in my training, I was flying a solo cross-country flight, and it was about 200-250 nautical miles. Always before starting a flight, we will check the weather of our flight path and the alternate, just in case if we have to divert. Everything was okay with the weather when we checked. But when I was flying, a huge CB cloud (cumulonimbus cloud) formed in an instance in front of me, and I thought I could go through it. But the clouds blocked the windscreen, and my altimeter went from 5000 to 7000 and again to 4000 meters. So, I took a steep turn and took a reciprocal route. After few seconds, the cloud burst into showers. I do not know what would have happened if I was inside and I considered myself very lucky that I have not gone forward into the clouds. The learning I got from it is not to go inside a cloud if I see it in front of me. So, that was a thrilling experience I had when I was in training which gives me spine-chills even now.

You wanted to start a YouTube channel and now it is running well. People often interact with you and ask for doubts. Recently I saw you conducting polls. So, how is the relation with them, and how it helps you in your profession?

There are so many versions of everybody. Some questions are very helpful for me too because I must go back, understand what I learned, and give it back to that person.

I get different kinds of questions that help me sharpen my intellectual. Like every action has an equal and opposite reaction, I am giving, and I am getting it back. I think that is how it helps others also.

There are so many pilots, friends of mine who correct me when I got something wrong. I give credits for them and put them on my stories from which other pilots also can see that information. It is all about helping each other and growing together.

In the first video of B winger, you mentioned "A right learning attitude". According to you, what is the right learning attitude that every student must have to succeed in their career?

You must be professional in what you are doing, especially in flying. In flying, if you are not thorough with what you have learned in the ground subjects, you cannot apply that. And I think that also applies in life. So, once you are thorough with what you are doing, make sure you apply it correctly and that happens only if you like what you are doing. Never be too high headed. Have that humbleness in you, that is the right kind of attitude. This was "The right learning attitude" I talk about, and I tell this in every video of mine on YouTube.

"Never be too high headed"

Working as a pilot with messy sleep schedules, you are even managing to run a YouTube channel with an ample number of followers with good content, what is the reason behind starting a YouTube channel?

COVID-19 lockdown has played an important role in that. I see so many people struggling for advice. They pay money to consultants just to seek that guidance. I thought of using this platform to help them and I am happy that I could contribute something to this society. "Have fun while flying" is the concept of B-winger. I tell people that it is not my channel, it is your channel.

Because even I am learning every day from them as well. Ultimately, the whole idea of the channel is to guide people, and with that, I am also guided. I am grateful that this happened.

"Have fun while flying"

From a normal student from a middle-class background to a Pilot living his dreams, you have come a long way. For every student like you, who wishes to live their dreams, what is your advice or the "success mantra"?

I am still in the learning phase of life, so I do not know if I can give any. But two things helped me to achieve success in life. The first thing is, I do meditation regularly which I feel gives me clarity of what I am doing and what I wanted to do.

It helped me to understand what is right and what is wrong for me. It gives me a balance. And the second thing is do not be afraid of trying something new. If you succeed, that is amazing. And if you do not, then you have nothing to lose.



If someone asks you the question of how to be a commercial pilot, what would be your answer to them, like how to start and accomplish it?

I made an equation for this by considering, what I did to reach here.

Medical + Examinations + Flying hours = CPL
First, go for a medical examination and check if you are medically fit to be a pilot as it saves you a lot of money before investing in the ground classes and flying. So, get yourself checked and get your medical done. The second thing is the examination. To appear for that, you should have passed your 12th with Physics and Math's. If you have a commerce background, you should give your exams again from an open school so that you can have that Physics and Math subjects.

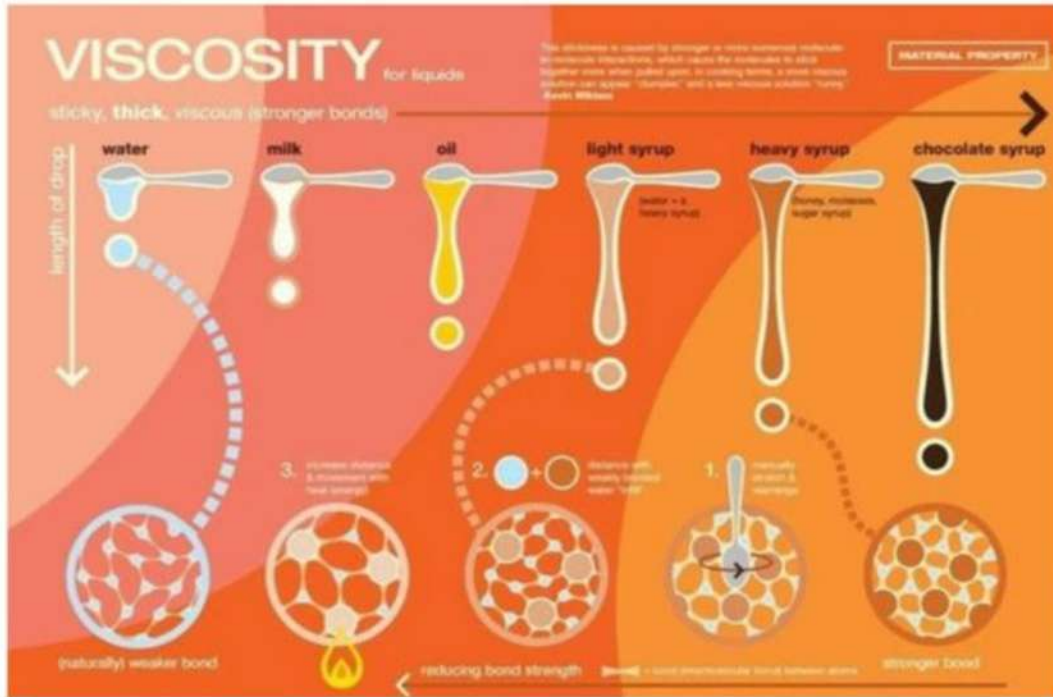
Once you do that, there are a set of examinations you need to give, which are DCCA exams. After that, there is the task of finishing your flying hours. In India, you should finish about 200 hours to get your CPL. In those 200 hours, there are certain exercises you need to fulfill, which the flying club will take care of.

Once you put all the three things together is where you can have your Commercial Pilot License [CPL].

**THE BUSIEST DAY RECORDED
IN AVIATION IS 24 JULY 2019,
WITH MORE THAN 225,000
FLIGHTS ON THAT DAY.**

DID YOU KNOW ? 

LIFE AND SCIENCE



VISCOSITY

Examples

- Honey
- Engine oil
- Milk Paints
- Cough
- syrup
- Castor oil

Viscosity is a measure of a fluid's resistance to flow. It describes the internal friction of a moving fluid. A fluid with large viscosity resists motion because its molecular makeup gives it a lot of internal friction. The viscosity of a liquid decrease rapidly with an increase in temperature, and the viscosity of gases increases with increase in temperature

Viscosity in gases

In the case of a gas, viscosity results from jumping of molecules from one layer of a gas to another layer. This means that the viscosity of a gas is caused by the transfer of momentum from one gas molecule to another. Thus, increasing the temperature of a gas will increase its momentum and thus the viscosity

RELATION BETWEEN HONEY AND WATER

Do you remember the first time you used a honey bottle, perhaps for green tea, or something else? You must have noticed when the honey bottle is nearly empty, and it takes very long for honey to reach the mouth of the bottle. Such behavior of a liquid in the flow is described by an intrinsic property called Viscosity.

It is defined as the property of a liquid by virtue of which an opposite force (internal friction) comes into play between different layers whenever there is a relative motion between these layers of the liquid. In other words, viscosity corresponds to the "thickness" of a liquid. For instance, honey is thicker than water because it is more viscous. In technical terms, viscosity is a measure of the resistance to the flow that a liquid offers when it is subjected to shear stress.



“

Note: Glycerin is a highly viscous liquid

THE TIRES ON AN AIRPLANE ARE DESIGNED TO WITHSTAND INCREDIBLE WEIGHT LOADS (38 TONS!) AND CAN HIT THE GROUND AT 170 MILES PER HOUR

DID YOU KNOW ?



REFERENCE

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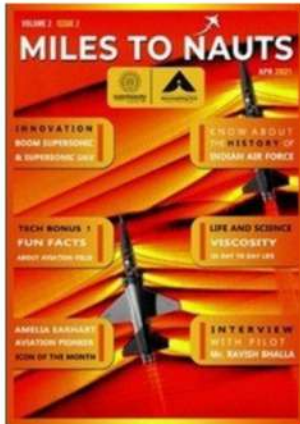
INNOVATION

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ICON OF THE MONTH

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Miles to Nauts



History team

Jenita N
Martin N

Icon of the month team

Sharankumar J
Lalithkumar PS

Innovation team

Haridharan K
Durga Devi G

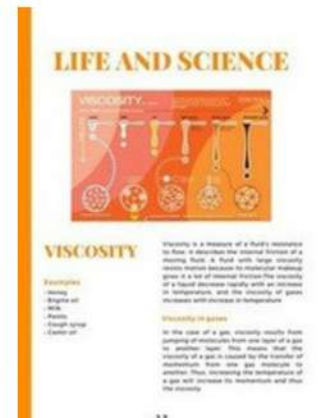


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Interview team

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Jaishri Prathiksha R



Editing team

Mahendran R
Sreehara S



Designing team

Lalithkumar PS
Martin N



HOD's NOTE :

Dr.SENTHILKUMAR.M



I am delighted to note that the Students Association of Department of Aeronautical Engineering and the Aeromodelling Club have taken initiatives of releasing Department Technical Magazine "Miles to Nauts". The magazine will be platform for the students to present their findings, collection of technical information, current affairs in the field of Aeronautical, Aerospace and Allied Engineering. Releasing of magazine will be helpful in many ways such as dissemination of knowledge to all the students, networking , communication, leadership skills, updates on activities of the department etc. I wish the technical magazine should carry many more useful information beneficial to all the students and provide a new dimension of growth to the department.

STAFF COORDINATOR's NOTE :

Mr.DARSHAN KUMAR.J



Every dreamer is not necessarily a doer and every doer is not always a dreamer. Life gives us numerous chances and opportunities to begin fresh and flourish. These happy thoughts shall brighten up each mind reading the journal. Have fun combining intellect and writing, enjoy every moment of this journey. Best wishes for your new initiative. Let our journal reach from one mile to 1000s of nauts through your mighty words. Let this endeavour touch the sky with glory .



VISION OF THE INSTITUTE

The vision of the college is to become a technical university of International Standards through continuous improvement.

MISSION OF THE INSTITUTE

Kumaraguru College of Technology (KCT) is committed to providing quality Education and Training in Engineering and Technology to prepare students for life and work equipping them to contribute to the technological, economic and social development of India. The College pursues excellence in providing training to develop a sense of professional responsibility, social and cultural awareness and set students on the path to leadership.

VISION OF THE DEPARTMENT

To attain excellence and global reputation in Aeronautical Engineering Education and Research.

MISSION OF THE DEPARTMENT

- The department is committed to provide quality education in Aeronautical Engineering to students to build their career and do quality research and thus contribute to the field of Aviation and Aerospace.
- The department aims to prepare students for their higher studies and research to contribute to the advanced technological needs of Aeronautical engineering.
- Encourage faculty to update their knowledge and teaching-learning process through continuous learning.
- Undertake inter-disciplinary research to contribute and support the industry.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

The Program Educational Objectives of Aeronautical Engineering Undergraduate Program are to prepare the students:

- I. To pursue a successful profession in leading organizations.
- II. To pursue postgraduate degrees and conduct research at leading technological universities to contribute to the advancement in the field of Aviation and Aerospace industries.
- III. To continue their professional development by utilizing educational and career building opportunities through their employer, educational institutions, or professional bodies.

PROGRAM OUTCOMES (POs)

Graduates of the Aeronautical Engineering Undergraduate Program should have the ability to:

PO 1: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7: Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

Graduates of the Aeronautical Engineering Undergraduate Program will have the ability to:

PSO 1: Apply concepts and principles of Aerodynamics, Aircraft Structures, Aircraft Propulsion, Aerospace Materials, UAV and Avionics to provide solutions to critical industrial problems.

PSO 2: Use the software packages in the design, manufacturing, testing and maintenance of aeronautical and aerospace-based components and systems