



Institution's Innovation Council
Saurashtra University Rajkot Rajkot

"Fundamentals of Aerodynamics"

17th October 2023

At

Seminar Room,

Dr. APJ Abdul Kalam Science Laboratory,

Incubation Centre,

Saurashtra University, Rajkot

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Saurashtra University – IIC

The university is dedicated to instruction, research, and extending knowledge to the public (public service). Ministry of Education (MoE), Govt. of India has established 'MoE's Innovation Cell (MIC)' to systematically foster the culture of Innovation among all Higher Education Institutions (HEIs). The primary mandate of MIC is to encourage, inspire and nurture young students by supporting them to work with new ideas and transform them into prototypes while they are informative years. Saurashtra University is one the Organization that have constituted the IIC to foster the vision of MoE and be a part for the promotion and development of innovation ecosystem.

Event Schedule

03:30	Welcome
03:35	Awareness session
04:15	Q & A
04:30	Closing Ceremony

Event Registration Link

bit.ly/SUSEC-AERO

Brief about Event

SU Start-up and Entrepreneurship Council, in collaboration with IIC Saurashtra University, organized a workshop on "Fundamentals of Aerodynamics" on 17th October 2023. The event was held at the Incubation Centre, A P J Abdul Kalam Science Laboratory. Aerodynamics is the study of the behaviour of air as it interacts with solid objects, such as aircraft, cars, buildings, and even animals. It plays a fundamental role in the design and operation of various vehicles and structures.

First of all, sir showcased the models of different types airplane and fighter planes. After that sir showed model of kid's fighter plane and Centre of gravity in aerodynamics, the centre of gravity (CG) is a critical concept related to the balance and stability of an aircraft. The centre of gravity is the point at which the aircraft would balance if it were suspended in the air with no external forces acting on it. Then sir said about proper body balance and roll stability are essential for the safe and controlled flight of an aircraft. Aircraft designers, engineers, and pilots work together to ensure that an aircraft's design and control systems are optimized for the desired level of roll stability while considering factors such as wing configuration, Ailerons, CG position, and control coordination.

Wings are critical components of an aircraft, and they can vary significantly in their design and features depending on the type of aircraft and its intended purpose. like Wing Sweep, Wing Shape, Wing Aspect Ratio, Winglets, Wing Materials, Wing Loading. Ailerons and elevators are primary control surfaces on an aircraft that help control its movement and orientation in flight. These control surfaces are typically found on the wings and tail of the aircraft. The vertical stabilizer and horizontal stabilizer are two important components of an aircraft's tail section, collectively known as the empennage. They serve distinct roles in stabilizing and controlling the aircraft. Together, the vertical stabilizer and horizontal stabilizer work to keep the aircraft stable in both yaw and pitch axes, ensuring it maintains a straight and level flight path. Pilots use the rudder and elevator to control these axes and make necessary adjustments during different phases of flight, including take off, cruise, and landing. It was explained by the speaker.

Afterward sir talked about glider and fighter planes are two distinct types of aircraft designed for different purposes, and they differ in several key aspects: Gliders are unpowered aircraft designed for unpowered flight. They are used for recreational soaring, training, and competition. when Fighter Plane are military aircraft designed for combat operations. Their primary purpose is to engage and destroy enemy aircraft. Gliders have no engine and rely on gravity and natural air currents for their forward motion. They are launched by various means, such as tow planes, winches, or even being pushed off a slope, and then they glide without power. Fighter planes are powered by jet engines or propellers, allowing them to generate thrust for sustained powered flight and high-speed manoeuvring.

Then sir showed example and give information about Bernoulli's principle in action is the lift generated by an airplane's wings. The shape of an airplane wing is designed to create a pressure difference, with lower pressure on the top surface and higher pressure on the bottom surface. This pressure difference results in an upward force, or lift, which allows the airplane to overcome gravity and stay in the air. When the airplane is flying at a low speed, the pressure difference is greater, helping it generate more lift. As the airspeed increases, the pressure difference decreases, which is why an airplane can take off and land at lower speeds but typically cruises at higher speeds. Propellers are a common component in many aircraft, particularly in piston-engine and some turboprop aircraft. They play a crucial role in generating thrust for the airplane. They are a common choice for many types of aircraft, providing efficient and reliable propulsion, particularly in slower-speed, lower-altitude operations. later sir gave short review of showcased air planes.

Key Points

During the session, below mentioned points were discussed:

- Introduction of aircraft models
- Centre of Gravity (CG)
- Proper body balance and roll stability
- Wings, Propellers and Control surfaces
- Vertical and Horizontal Stabilizers
- Glider vs. Fighter Plane
- Bernoulli's principle
- FAQs Related to Fundamentals of Aerodynamics?

Outcome

In the presentation, a wide range of key aviation concepts and components were covered. The speaker began by showcasing different aircraft models, from fighters to kid's planes, and then delved into the critical concept of the centre of gravity (CG) in aerodynamics, emphasizing its importance for aircraft stability. The discussion extended to topics such as body balance, roll stability, wing design factors, primary control surfaces like ailerons and elevators, and the role of the vertical and horizontal stabilizers in maintaining flight stability. A comparison between gliders, unpowered aircraft designed for soaring, and fighter planes, powered military aircraft built for combat. The explanation of Bernoulli's principle illustrated lift generation on wings, and the role of propellers in generating thrust was discussed, particularly in piston-engine and turboprop aircraft.

About the Speaker/Chief Guest



Mr. Neeraj
Parekh

Founder
Flight Club-Dubai, Rajkot



Fundamentals-of-Aerodynamics

The SU Startup and Entrepreneurship Council, in collaboration with the IIC Saurashtra University, will be hosting a seminar on "Fundamentals of Aerodynamics" on Tuesday, October 17, 2023. This seminar may provide valuable insights into the principles of aerodynamics.

Guest Speaker

Mr. Neeraj Parekh
Founder, Flight Club-Dubai,
Rajkot

17 October 2023
3:30 PM ONWARDS

Seminar Room,
Dr. APJ Abdul Kalam Science Laboratory,
Incubation Centre,
Saurashtra University
Rajkot

Registration Link | bit.ly/SUSEC-AERO



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