# ISRO SPACE TUTOR

A Skyline – ISRO Collaboration Program

## ISRO SPACE TUTOR PROGRAM

This announcement of Indian Space Research Organisation (ISRO) Space Tutor program aims to engage with the NGOs / educational institutions purely engaged in the STEM education and promotion, to engage with ISRO in promoting space education and creating awareness of space activities & applications to the student community for creating scientific temperament and culture of innovative thinking amongst the students.

## SKYLINE – ISRO COLLABORATION

Skyline Space is a space EdTech company, has constantly been working on various space related research programs and educating students in the space domain. Kicking off from the year 2023, team Skyline has been teaching over 1000+ students through internships space outreach programs and short courses. Now we have taken another step forward in space education by collaborating with ISRO. Skyline have been recognised as "Registered Space Tutor of ISRO". We are immensely thankful to ISRO for this great opportunity, we promise to continue our efforts in spreading space knowledge to every child of this nation.

## ENGAGEMENT WITH ISRO

- Educational Content Collaboration
- ISRO Expert Webinars
- ISRO Facility Tours
- Internship Programs
- Joint Space Education Workshops
- Space Challenges and Competitions
- Space Education Curriculum Development
- Public Outreach Campaigns
- Research and Development Support

# ROCKET –  SPACE LAUNCH VEHICLE

A rocket is a vehicle that uses jet propulsion to accelerate without using the surrounding air. A rocket engine produces thrust by reaction to exhaust expelled at high speed. Rocket engines work entirely from propellant carried within the vehicle; therefore, a rocket can fly in the vacuum of space. In fact, rockets work more efficiently in a vacuum and incur a loss of thrust due to the opposing pressure of the atmosphere. A model rocket are small rockets designed to reach low altitudes (e.g., 100–500 m (330– 1,640 ft) for 30 g (1.1 oz) model) and be recovered by a variety of means.

## COURSE HIGHLIGHTS

- Advanced knowledge about Rocket Science
- Advanced mechanism of rockets and its types
- An overview of Model Rocketry
- Model Rocket and its components
- Study of model rocket and launching
- Study of earth segment and space segments
- Study of interplanetary mission by various aspects

## MAJOR TOPICS

- Solid Rocket Propulsion
- Liquid Rocket Propulsion
- Hybrid Rocket Propulsion
- Cryogenic Rocket Propulsion
- Nuclear and Advanced Propulsion
- Functions, Parts, and Mechanisms
- Aerodynamics and Space Dynamics

# SATELLITE - SPACECRAFT

A satellite is an object that moves around a larger object. Earth is a satellite because it moves around the sun. The moon is a satellite because it moves around Earth. Earth and the moon are called "natural" satellites. But usually when someone says "satellite," they are talking about a "man-made" satellite. There are hundreds of satellites in operation. They are used for diverse purposes such as weather forecasting, television signal, amateur radio and internet communications and the Global Positioning System. They are also used to look outward at the solar system for research and data gathering purposes.

## COURSE HIGHLIGHTS

- The advanced knowledge about Satellite Technology
- The advanced mechanism of satellite and its types
- To enable the student to become familiar with satellites and its services
- Study of satellite orbits and launching
- Study of earth segment and space segment components
- Study of satellite access by multiple users

## MAJOR TOPICS

- Elements of orbital mechanics
- Elements of communication satellite design
- Spacecraft subsystems
- Satellite Launch Systems
- Satellite onboard processing
- Telemetry tacking system
- Equations of motion
- Satellite Communication System

## DRONE – UNMANNED AERIAL VEHICLES

A drone is a type of unmanned aerial vehicle (UAV), which is an aircraft without a human pilot, crew, or passengers. Unmanned aerial vehicles (UAVs) are a part of an unmanned aircraft system (UAS), which also comprises a ground-based controller and a communications network for the UAV. There is various application of drones. Initially drones were only used by military. Now it is used by many professional and individuals. Drones are used in various fields. Areas ins which drones can be used are construction, defence, photography, marketing, delivery, agriculture, rescue.

## COURSE HIGHLIGHTS

- The advanced knowledge about Drone Technology
- The advanced mechanism of drone and its types
- The advanced knowledge on working principle behind drones
- To be familiar with the parts of a drone
- Applications of drones in various fields
- Recent advancements in drones

## MAJOR TOPICS

- Introduction to Aerospace
- Physics behind drones
- Flight Mechanics
- UAV Aerodynamics
- Drone Georeferencing
- Level of Autonomy in UAV
- Preliminary designs of drone
- UAV Coordinate system

# AERONAUTICS - AIRCRAFT

Aeronautics is the study that deals with designing, manufacturing, flying, and navigating of an aircraft. The word Aeronautics in Greek literally means Air and Navigation, and the technology has emerged from the roots of nature. Inspired from birds, early men started building aircrafts which later became an eminent part of living. Aircrafts are used for transportation, emergency evacuation, defence services, and exploration. Modern aircrafts include Commercial airplanes, Fighter Jets, Freighter or Cargo planes, Stealth Jets, Interceptor planes and more! Aviation technology is constantly improving, and engineers are aiming to increase safety and reliability on flying machines. In this course, we'll take a dive into this amazing and innovative realm of Aeronautics and Aviation!

## COURSE HIGHLIGHTS

- Introduction to Aeronautics
- Aircraft Manufacturing Technology
- Mechanism of Aircraft and its types
- Gliders – Design, Working and Application
- Types of Aircrafts

## MAJOR TOPICS

- Types of Propellants
- Fundamentals of Aircraft
- Boundary Layer Theory
- Aircraft Aerodynamics
- Aerofoils
- Fluidic Propulsion of CFD
- Hypersonic Space Shuttle
- Missile Casing

# SKYLINE