

KARNATAK LAW SOCIETY'S  
**GOGTE INSTITUTE OF TECHNOLOGY**

UDYAMBAG, BELAGAVI-590008

(An Autonomous Institution under Visvesvaraya Technological University, Belagavi)

(APPROVED BY AICTE, NEW DELHI)



**UAS Design, Simulation & Flight Training  
Lab**

**FOR**

**Third Semester Department of Aeronautical Engineering Students**

**DEPARTMENT OF**  
**AERONAUTICAL ENGINEERING**  
**KLS GOGTE INSTITUTE OF TECHNOLOGY**



**UAS Design, Simulation & Flight Training Lab**  
**FOR**  
**Students of Third Semester**

## Overview

UAV design, simulation, and flight training cover the fundamentals of creating unmanned aerial vehicles, including airframe design, propulsion systems, and control algorithms. Simulations test flight dynamics, stability, and performance, while flight training involves hands-on piloting, navigation, and safety skills. In the aeronautical field, these skills are essential for developing advanced aerial systems and optimizing aircraft performance. UAV technology fosters innovation in aerospace, defense, and agriculture, offering job opportunities in aircraft design, flight dynamics, avionics, and control systems, meeting the demand for professionals skilled in robotics, AI integration, and aerial data analysis.

Theory: 18 Hours

Demo: 6 Hours

Lab sessions: 12 Hours

Total duration: 36 Hours

### Module 1: Introduction to UAVs

- Overview of UAV types and classifications
- Applications in various fields (aerospace, agriculture, surveillance)
- Emerging trends and technological advancements

### Module 2: UAV Aerodynamics and Flight Mechanics

- Principles of flight (lift, drag, thrust)
- Stability and control basics
- Overview of flight dynamics specific to UAVs

### Module 3: UAV Design and Structures

- Key airframe components and materials
- Propulsion systems (electric motors, IC engines, hybrid systems)
- Payload integration, weight distribution, and balance

### Module 4: Avionics and Control Systems

- Flight controllers, sensors (gyroscopes, accelerometers, GPS)
- Basics of communication systems and telemetry
- Introduction to autopilot and flight control algorithms
- Introduction to UAV simulation tools
- Flight dynamics modelling and performance analysis
- Testing and validation through simulation software

## **Coordinators**

**Mr. Ishwaragowda V Patil**

Dept. of Aeronautical Engineering

Phone: 9037800468

E-mail: ivpatil @git.edu

## **Outcomes**

- Understand various applications and emerging trends in UAV technology.
- Demonstrate an understanding of UAV stability, control, and flight dynamics.
- Understand basic flight control systems, communication, telemetry, and autopilot functionalities.
- Analyze UAV performance through simulations and understand testing and validation procedures.
- Prepares students for careers as UAV design engineers, flight dynamics analysts, simulation engineers, avionics specialists, and UAV testing technicians, focusing on UAV design, flight mechanics, control systems, and simulation testing.

In order to accept and start the training program, students are required to register with the respective department. Details to be provided by the student to the department include: **Name, USN, UID, Mobile No, Email id**

## **Terms and Conditions**

- Only students who have paid a skill lab fee to the institution are eligible for the training.
- The students must maintain 90% attendance for obtaining the skill lab certificate.
- Students must attend training as per scheduled time

KARNATAK LAW SOCIETY'S  
**GOGTE INSTITUTE OF TECHNOLOGY**

UDYAMBAG, BELAGAVI-590008

(An Autonomous Institution under Visvesvaraya Technological University, Belagavi)

(APPROVED BY AICTE, NEW DELHI)



**UAS Design, Simulation & Flight Training  
Lab**

**FOR**

**Fifth Semester Department of Aeronautical Engineering Students**

**DEPARTMENT OF  
AERONAUTICAL ENGINEERING  
KLS GOGTE INSTITUTE OF TECHNOLOGY**



**UAS Design, Simulation & Flight Training Lab  
FOR  
Students of Fifth Semester**

## Overview

UAV design, simulation, and flight training cover the fundamentals of creating unmanned aerial vehicles, including airframe design, propulsion systems, and control algorithms. Simulations test flight dynamics, stability, and performance, while flight training involves hands-on piloting, navigation, and safety skills. In the aeronautical field, these skills are essential for developing advanced aerial systems and optimizing aircraft performance. UAV technology fosters innovation in aerospace, defense, and agriculture, offering job opportunities in aircraft design, flight dynamics, avionics, and control systems, meeting the demand for professionals skilled in robotics, AI integration, and aerial data analysis.

Theory: 12 Hours

Demo: 6 Hours

Lab sessions: 18 Hours

Total duration: 36 Hours

### Module 1: Flight Training and Operations

- Fundamentals of flight planning and navigation
- Manual piloting techniques and basics of autonomous flight
- Safety procedures and emergency protocols

### Module 2: UAV Regulations and Safety

- Overview of national and international UAV regulations (e.g., FAA, DGCA)
- Airspace management and UAV operation limits
- Risk assessment and safety protocols

### Module 3: UAV Systems Integration and Testing

- Techniques for integrating various subsystems (power, communication, payload)
- Testing methodologies for UAV systems (simulation vs. real-world testing)
- Data analysis and performance assessment post-testing

### Module 4: Emerging Technologies and Future Trends

- Exploration of cutting-edge UAV technologies (swarming, BVLOS, etc.)
- Future applications in various industries (delivery, disaster response, urban air mobility)
- The impact of UAVs on environmental monitoring and sustainable practices

## **Coordinators**

**Mr. Ishwaragowda V Patil**

Dept. of Aeronautical Engineering

Phone: 9037800468

E-mail: ivpatil @git.edu

## **Outcomes**

- Demonstrate manual piloting techniques and understand the fundamentals of autonomous flight systems.
- Conduct risk assessments and implement safety protocols to mitigate operational hazards.
- Conduct thorough testing and data analysis for UAV performance validation.
- Identify and assess future trends and technologies in the UAV sector.

In order to accept and start the training program, students are required to register with the respective department. Details to be provided by the student to the department include: **Name, USN, UID, Mobile No, Email id**

## **Terms and Conditions**

- Only students who have paid a skill lab fee to the institution are eligible for the training.
- The students must maintain 90% attendance for obtaining the skill lab certificate.
- Students must attend training as per scheduled time