

ASE107:FUNDAMENTAL OF DRONE TECHNOLOGY

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

- CO1 :: Recall the history and evolution of drones
- CO2 :: Explain the key components and classification of drones.
- CO3 :: Identify differences between military and civilian unmanned aircraft in practical contexts
- CO4 :: Demonstrate various types of drones based on their design and usage
- CO5 :: Differentiate the factors influencing drone evolution and adoption.
- CO6 :: Illustrate how drone classifications affect their operational roles

Unit I

Introduction to drone : Introduction, Brief history of drones, Evolution of drones, Key components of a drone, Classification of drones, Military and Civilian Unmanned Aircraft.

Unit II

Drones Rules and Regulations : Classification of drones, Drone certification, Drone Registration, Drone Operations, remote pilot license, remote pilot training organization, research and development, drone traffic management, insurance, drone promotion

Unit III

Multi Rotor Dynamics : Full Rigid-Body Dynamics, Generating Force and Torque, Hover, Forward Flight, Maximum Tilt and Thrust, Drag and Maximum Velocity.

Unit IV

On Board Electrical components and Payloads : Actuators, BLDC Motor, Electronic Speed Controller, Power Distribution Board (PDB), Battery, Battery Charger, RGB Camera, Thermal Camera, Multispectral Camera, LIDAR Sensor, Gimbal.

Unit V

Remote controller and Autopilot : Basic Remote Controller, Receiver, Telemetry System, Introduction to autopilot System, Internal Sensors, External Sensors

Unit VI

Applications and Advancements in UAV : Commercial Applications,, Military Applications, Technology evolution and its applications, AI and AR capabilities

Text Books:

1. BASICS OF UNMANNED AERIAL VEHICLES by GARVIT PANDYA, NOTION PRESS CHENNAI

References:

1. HANDBOOK OF UNMANNED AERIAL VEHICLES by KIMON P. VALAVANIS, SPRINGER
2. GUIDANCE OF UNMANNED AERIAL VEHICLES by RAFAEL YANUSHEVSKY, ROUTLEDGE