



3GIRPS
INSTITUTE OF RESEARCH & POLICY STUDIES
BUILD INDIA TO SERVE THE WORLD

**3G INSTITUTE OF RESEARCH AND POLICY STUDIES
PRESENTS**

**90+ HOURS
DRONE**

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Drone: Dynamic Remotely Operated Navigation Equipment.

Drone is one of the layman terms of the Unmanned Piloted aircrafts, refers to an aircraft without being a pilot onboard. Instead, the aircraft is operated from the ground through a ground-based controller.

When we google drone, instead of what is a drone? We get the results on how can we get the drone! That much the trend has been changed and necessity of drone has been increased.

SCOPE:

In future, everything is going to be drones. From being hobby to military applications, it is going to be a technology that is going to get transformed into the commercial application. The commercial usage of drones has increased in the past years rapidly and in the future, the opportunities in this domain will reach the sky.

The other way around called unmanned aerial vehicles (UAVs), drones are as of now breaking the hindrances in the business operations of the organizations. The business giants like Google, Amazon, and others already entered into drone delivery systems for delivering their packages. Drones have been used as temporary internet connection providers at remote locations, and the list goes on...

1. Academic phase:

1.1. Introduction

1.2. Introduction about drones – Overview - Nos 0

2. Part 1: Strategy / Market

2.1. Markets for UAVs _____ Nos 0

2.1.1. Goals:

2.1.2. Main objective:

2.1.2.1. The general objective of this sub-module is to describe the potential markets for civil drones through the help of economics tools

2.1.3. Detailed objectives:

2.1.3.1. After this module, the student will be able to:
Present the different markets for civil UAVs

Characterize the potential markets for civil UAVs
Define the different markets with the help of an economics methodology
Explain what an equilibrium is, how it can evolve
Explain what demand and supply are in the market, and to What They are sensitive to
Explain what a sensitivity analysis is and do it for new markets for civilian UAVs

2.2. Strategy

2.2.1. Goals _____ Nos 0

2.2.2. Main objective:

2.2.2.1. The general objective of this sub-module is to study the strategic environment of competitors in the downstream market

2.2.3. Detailed Objective:

2.2.3.1. After completing this module, the student will be able to:

Present the different strategies available

Characterize the industry, its main drivers

Present the methodology of Porter to perform market analysis

Explain how competition can take place on the downstream markets

2.3. Regulatory framework – Law

2.3.1. Goals

2.3.2. Main objective:

2.3.2.1. The general objectives of this course are:

to present the regulatory framework applicable to civil aviation, including the unmanned aircraft

to present civil law dealing with UAV operations

2.3.3. Detailed objectives:

2.3.3.1. After Completing this module, the student will be ~~ble~~ able to:

Present the international regulatory bodies (ICAO, EASA) Their role and the labor regulations Issued

DGCA regulations on UAVs

Describe the associated system of certificates / approvals

Present the regulatory framework applicable to UAV

Understand the civil law applicable to UAV operations

3. Part 2: Vehicle technical aspects

3.1. Introduction

3.1.1. Goals:

3.1.2. Main objective:

3.1.2.1. Introduction - Study case: One mission, one UAV

3.2. Airframe

3.2.1. Goal:

3.2.2. General:

3.2.2.1. The general objective of this course is to describe and explain how an UAV can fly, from the physical principles applied to an UAV to its main performances (both fixed and rotary wing UAVs will be considered) in order to choose the adequate platform for the intended mission and understand the operational and flying behavior of the UAV.

3.2.3. Detailed objective:

3.2.3.1. At the end of the module, the student will be able to :

Describe and explain the aerodynamic forces applied to an UAV, describe how they can be modeled for basic analysis.

Describe and explain the flight mechanics of an UAV.

Describe and explain how the structure behaves under flight or operational loads.

Describe, explain and calculate the main performances of an UAV.

3.3. Power plant

3.3.1. Goal

3.3.2. general:

3.3.2.1. The general objective of this sub-module is to give to the student a good understanding of the functioning of the UAVs power plants and the ability to identify the pertinent parameters to be adjusted to improve, regarding the mission, the performance of the system.

3.3.3. Detailed objective:

3.3.3.1. After completing this module, the student will be able to:

list the different existing power plants,

list the components of a gasoline power plant,

explain the theoretical functioning of the different gasoline engine system components,

list the components of an electrical power plant,

explain the theoretical functioning of the different electrical engine system components,
explain the functioning of a propeller and identify its main characteristics,
explain the influence of all the designing parameters on the performance of the system,
operate such systems.

3.4. System architecture

3.4.1. Goals

3.4.2. Main objective:

3.4.2.1. The general objective of this sub-module is to give a comprehensive view of the architecture of an UAV system

3.4.3. Detailed objectives:

3.4.3.1. After filling this module, the student will be able to:

Describe and explain the main elements of an UAV system architecture
Perform basic manipulation with an UAV system in simulation.

3.5. Avionics – On board systems

3.5.1. Goals

3.5.2. Main objective:

3.5.2.1. The general objective of this sub-module is the description and explanation of the hardware and software parts of UAV avionics

3.5.3. Detailed objectives:

3.5.3.1. After Completing this module, the student will be able to:

Use mathematical tools in order to model and analyze UAV on-board systems
Describe the characteristics of sensors and actuators used it UAV
Explain the principles of multi-sensor fusion
Perform basic tuning of control and guidance laws onboard UAV
A micro-controller

3.6. Communications

3.6.1. Goals:

3.6.2. Main Objective

3.6.2.1. The general objective of this sub-module is the description of the radio frequency communication and the associated issues

3.6.3. Detailed objectives:

3.6.3.1. After this module, the student will be able to:

Describe and / or explain the different functions and characteristics of the elements of RF communication.

- Describe the basic characteristics of antennas, i.e. gain, matching, bandwidth, frequency pattern
- Describe the specificities of UAV antennas
- Describe the network and the way to protect the data

3.7. Applicable regulations to UAVs

3.7.1. Goals

3.7.2. Main objective:

- 3.7.2.1.** The general objective of this sub-module is to present the technical regulations which are, or will be, in the future, applicable to UAVs.

3.7.3. Detailed objectives:

- 3.7.3.1.** After this module, the student will be able to:
 - Present the regulatory roadmap applicable to the UAVs
 - Describe the main regulatory principles applicable to UAVs:
 - With the present regulations
 - With the future standards

3.8. Design Considerations

3.8.1. Goals:

3.8.2. Main objective:

- 3.8.2.1.** The general objective of this sub-module is to emphasize the importance of design parameter and component selection in a synergistic way in order to improve the performance of an electrically powered fixed-wing aircraft.

3.8.3. Detailed objectives:

- 3.8.3.1.** After completing this module, the student will be able to:
 - list the important design parameters and their effect on the final performance,
 - explain the interaction between design variables and the main components,
 - define a cost function starting from a mission definition,
 - use a code in order to investigate the performance evolution.

4. Part 3: Field / Operations

4.1. UAV's Mission

4.1.1. Objectives

4.1.2. Main objective:

- 4.1.2.1.** The general objective of this sub-module is to give an overview of the UAVs domain and to explain the analysis process: from the need to the mission, through the UAV.

4.1.3. Detailed objectives:

- 4.1.3.1. After completing this module, the student will be able to:
 - Describe how UAVs are used in several domains
 - Explain all the necessary steps to fulfill the mission in accordance of the need
 - Analyze the need: make a functional analysis, define the vector, sensors, data treatment and the mission.

4.2. Flight operations

4.2.1. Goals

4.2.2. Main Objectives:

- 4.2.2.1. The general objective of this sub-module is to explain how to prepare a mission taking into account all the constraints.

4.2.3. Detailed objectives:

- 4.2.3.1. After completing this module, the student will be able to:
 - Identify air traffic rules to be taken into consideration
 - Write a Particular Operation Manual
 - Integrate the meteorology aspects into the mission
 - Understand the issues of Safety and human factor

4.3. Pilot training – In flight awareness

4.3.1. Goals

4.3.2. Main objective:

- 4.3.2.1. The general objective of this sub-module is UAV flights.

4.3.3. Detailed objectives:

- 4.3.3.1. After Completing this module, the student will be able to:
 - List the requirements to get pilot licenses
 - List the TV pilot requirements
 - Work on a team
 - Identify the Responsibilities of the TV pilot
 - Identify the hand of the piloting Difficulties

4.4. Sensors, software and data processing

4.4.1. Goals

4.4.2. Main objective:

- 4.4.2.1. The general objective of this course is to describe the different types of sensors, their uses and the data processing

4.4.3. Detailed objectives:

- 4.4.3.1. After filling this module, the student will be able to:
 - Choose the relevant data for the customer
 - Request the relevant information for the data processing

4.5. UAV Modifications and Maintenance

4.5.1. Goals

4.5.2. Main objective:

- 4.5.2.1.** The general objective of this sub-module is to explain how to proceed for an UAV modification

4.5.3. Detailed objectives:

- 4.5.3.1.** After completing this module, the student will be able to:
 - Analyze the impact of a modification on each sub-system of an UAV
 - Identify the comprehensive maintenance tasks to be performed during the life of an UAV

4.6. Management / Entrepreneurship conferences

4.6.1. Goals

4.6.2. Main objective:

- 4.6.2.1.** The general objective of this course is the understanding of the basics of the management of a firm, from its creation to financing the strategy

4.6.3. Detailed objectives:

- 4.6.3.1.** After Completing this module, the student will be able to:
 - Explain the procedure to create a firm
 - Explain the different means clustering to finance the establishment of a firm
 - Explain the basics of structure firm
 - Explain the basics of corporate finance of a firm
 - Explain the basics of accountability of a firm

4.7. Long project- Integrated AI and UAV

4.7.1. Goals

4.7.2. Main objective:

- 4.7.2.1.** The general objective of this module is to realize a complete study case, from the strategic analysis to the client deliverable

4.7.3. Detailed objectives:

- 4.7.3.1.** After filling this module, the student will be able to:
 - Realize a strategic analysis
 - Make a project plan
 - Make a functional analysis
 - Choose the most appropriate components (sensors, vector, software ...)
 - Organize the mission

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Course Offered

- Internship
- Google AI
- Python
- Ethical Hacking
- Machine Learning - Deep Learning Workshop

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