Course & Kit Content

Of

Quadcopter & UAV

Duration 15 Days

Kit Partner

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Robosapiens Technologies Pvt. Ltd.
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Course Name : **QUADCOPTER & UAV**
Certification : By Robosapiens Technologies Pvt. Ltd.
Toolkit : **FREE** to Each Participant

Detailed Course Content:

1. **Introduction to Multicopter**

   1.1. Definition
   1.2. History of Quadcopter
   1.3. Difference between different types of Multicopter
   1.4. Why Quadcopter
   1.5. How Quadcopter works
   1.6. Application of Quadcopter
   1.7. Current Industrial Quadcopter
   1.8. Future of Quadcopter

2. **Anatomy of Quadcopter**

   2.1. What are Basic Modules?
   2.2. Why Need of Basic Modules
   2.3. Operating Techniques
   2.4. Constructional Techniques
   2.5. Working Approach on Quadcopter.

3. **Base of Multicopter**

   3.1. Frame
   3.2. Types of Frame
   3.3. Frame Configuration
   3.4. Propeller
   3.5. History of Propeller
   3.6. Theory and Designing of Propeller
   3.7. Standard Propeller Size
   3.8. Different forces acting on Propeller
   3.9. Understanding Propeller Size and Control
   3.10. Analysis of Propeller Pitch, Diameter and RPM

4. **Introduction to Sensors (Input Device)**

4.1. What is Sensor?

4.2. Various Industrial Sensors
4.3. Selection of Sensor
4.4. Use of Sensor in QuadCopter
4.5. Interfacing of Sensors
4.6. Basic working Technique of Sensor
4.7. Application of Sensor

5. **How to work on Educational & Engineering Level Actuator**

5.1. Types of Motors
5.2. Basic working concept of Motors
5.3. Difference between Brushed and Brushless DC motor
5.4. Characteristics of BLDC
5.5. Advantages of BLDC
5.6. Applications of BLDC
5.7. Theory of operation of BLDC
5.8. Different Phase BLDC Motor
5.9. Evaluation of BLDC.

6. **Electronic Speed Controller (ESC)**

6.1. Features
6.2. Working
6.3. Pulse Width Modulation
6.4. Interfacing of ESCs
6.5. Start up Procedures
6.6. Protection Methods
6.7. Trouble Shooting.

7. **Introduction to Flight Controller Board**

7.1. What is Computational Device?
7.2. Transistor
7.3. Logic Gates
7.4. Difference between Microcontroller and Microprocessor.
7.5. Microcontroller Architecture and Interfacing.
7.6. Understanding the detailed pin out of the Microcontroller.
7.7. Understanding different protocols and peripherals of Flight Controller Board
7.8. How can we use Microcontroller in our Own Circuits?

8. **Programming concept for Quad**

8.1. Timers

8.1.1. Types of Timer

8.1.2. Programming concept of Timers

8.2. PWM
8.2.1. Theory of PWM
8.2.2. Programming concept of PWM
8.3. USART
8.3.1. USART Programming concept

8.4. Analog to Digital Converter
8.4.1. Theory of ADC
8.4.2. Programming concept of ADC
8.4.3. Programming concept of Accelerometer1

9. **Introduction to Battery**

9.1. Difference between Lithium Ion (Li-ion) and Lithium Polymer (Lipo) Battery
9.2. Characteristics of Lipo Battery
9.3. Benefits and Downsides of using Lipo
9.4. Charging Lipo Battery
9.5. Maximum charge voltage and current
9.6. How to overcome over discharging
9.7. Do's and Don'ts for Lipo
9.8. Safety Precautions.

10. **Radio Devices**

10.1. Definition
10.2. Use of RC Remote Control
10.3. Understanding Radio Transmitter
10.4. Types of Radio Transmitter
10.5. Different Channels of Radio Transmitter
10.6. Basic Functionalities of RC Transmitter

11. **Assembling the Robosapiens Quadcopter Mega DIY Kit**

12. **Installation of Software and Debugging**

12.1. Flashing the Firmware into Flight Controller Board with the use of Programmer
12.2. Updating the Firmware
12.3. Synchronizing RC Transmitter and Receiver

12.4. Calibrating RC Transmitter

12.5. Working with Flying Model Simulator (FMS)

13. **Theory of Interfacing External devices**

13.1. GPS
13.2. Camera

LIVE Projects Covered:

1. Calibrating RC Transmitter
2. Flying Model Simulator
3. Assembling
4. Flying Session

15 Days KIT Contains:

S. No.	Name of the Component	Quantity	Figure
1	***Glass Fiber Quadcopter Frame with integrated Power Distribution Circuit***	2	
2	***Pair Legs (RED and White)***	2	
3	***Pair Propellers (Left and Right)***	2	
4	***Screw driver***	1	
5	Robosapien's Educational and Software Material CD	1	
6	Nut Bolt Packet	1	
7	Paper Beg/Box	1