

Course Code CSA2002	INTRODUCTION TO DRONES	Course Type	LT
		Credits	2
Course Objectives			
<div>1. To understand the basics of Unmanned Arial Vehicles (Drones) and its various applications.</div> <div>2. To impart the knowledge of how to fly a drone by considering the rules and regulations to the specific country</div> <div>3. To understand the safety measures to be taken during flight</div>			
Course Outcomes			
<div>Students who complete this course will be able to</div> <div>1. To introduce the various types of frame design used for the UAV/Drones and to accommodate the electronics over the frame to fly Drones.</div> <div>2. To make the students understand the basic working principal behind the electronic components used and its specification to build a drone from scratch.</div> <div>3. To enable the students to identify and understand various functional modules of the controller using a preprogrammed controller used in the UAV/Drones.</div>			
Student Outcomes (SO)		a,b,e,i	
<div>a. An ability to apply the knowledge of mathematics, science and computing appropriate to the discipline</div> <div>b. An ability to analyse a problem, identify and define the computing requirements appropriate to its solution</div> <div>e. An ability to identify, formulate and solve engineering problems.</div> <div>i. Design and conduct experiments as well as analyze and interpret data</div>			
Module No.	Module Description	Hrs	SO
1	Intro to Drones Introduction to UAVs/Drones - Drones – Working Principle and Design- Types of Drones –Motors – Battery – connectors – Assembling the Drones – Frame – aerodynamics needed for flying Drone.	5	a,b
2	Building Drones How to Build a Drone – Preparing – APM planner – Building Follow me drone – Arduino based drones – GPS tracker using ESP8266.	6	a,b,e
3	Drones Controllers Building mission control drones – Using Drones and delivery man –Record Videos – Photography Drone – Controlling Camera.	6	a,b,e
4	Drone Maintenance Building Prototype Drones – Gilding Drones – Racing Drones – Maintaining and trouble shooting of Drone.	6	a,b,i
5	Applications of Drones Artificial Intelligence techniques in Drones - Drone part design using 3D Printer, Flying Projects.	5	a,e,i
	Guest Lecture on Contemporary Topics	2	
	Total Lecture:	30	
Mode of Teaching and Learning:			
Flipped Class Room, One Lecture to be videotaped, Digital/Computer based models to augment lecture for practice/tutorial, 2 hour lectures by industry experts on contemporary topics.			

Mode of Evaluation:

The assessment and evaluation components including, Building drones, student's Drone innovative application assessment practices followed by faculty, in addition to the Continuous Assessment Tests and Term End Examination.

Text Book(s):

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| 1. | Syed Omar Faruk Towaha, Building Smart Drones with ESP8266 and Arduino: Build exciting drones by leveraging the capabilities of Arduino and ESP8266, Packt Publishing, 2018. |
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Reference Books:

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| 1. | Theory, Design, and Applications of Unmanned Aerial Vehicles- by A. R. Jha Ph.D. (Author), 2016 |
| 2. | Handbook of Unmanned Aerial Vehicles- Editors: Valavanis, K., Vachtsevanos, George J. (Eds.), 2014 |
| 3. | Jane's Unmanned Aerial Vehicles and Targets -by Kenneth Munson (Editor), 2010 |
| 4. | Guidance of Unmanned Aerial Vehicles- by Rafael Yanushevsky (Author), 2011 |

Recommendation by the Board of Studies on	24.06.2020
Approval by Academic council on	29.06.2020
Compiled by	Dr S Sountharajan