

COURSE CODE	COURSE TITLE	L	T	P	C
1152AE349	Unmanned Systems	2	0	2	3

Course Category:

Program elective

a. Preamble :

This course provides hands on experience on design, & development of unmanned systems (UGV, UWV, UAVs) category aircraft. Students will get in-depth skill set on Navigation and controls system of UAS

b. Prerequisite Courses:

NIL

c. Related Courses:

- Unmanned Aerial Vehicle
- Aircraft design

d. Course Educational Objectives :

- To understand the preliminary concepts of UAS Design ,Navigation & Control of UAS
- To impart practical skill on Development of UAS systems

e. Course Outcomes :

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Classify unmanned systems	K2
CO2	Explain various systems for unmanned vehicles	K2
CO3	Explain applications of unmanned systems	K2
CO4	Explain navigation and autopilot for unmanned systems	K3, S3
CO5	Explain design features of unmanned vehicle	K3, S3

f. Correlation of COs with POs :

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	H	H	H	M						
CO2	H		H	H	H							
CO3	H		H	H	H							
CO4	H	H	H	H	H							
CO5	H	H	H	H	H	M						

H- High; M-Medium; L-Low

g. Course Content :

UNIT-I INTRODUCTION TO UAS

History of UAS, Basics of UGV, UWV, UAVs, Classification of Unmanned systems, sea planes, hovercraft. Payload.

UNIT-II DESIGN CONCEPT OF UGV, UWV, UAVS SYSTEMS

Design concept of UAS, Launching and recovery of the system, Propulsion system of UAS.

UNIT-III APPLICATIONS

List of UAS, Application of UGV, Application of UWV, Application of UAVs

UNIT-IV NAVIGATION AND CONTROLS OF UAS

Ground control station, UAS navigation system, UAS, Autopilot system

UNIT-V CASE STUDY

Case study of UGV, UWV and UAS – application, design, features, performance characteristics

EXPERIMENTS

1. Design of UAS
2. Application of UAS
3. Ground controls station
4. UAV software (mapping)
5. Autopilot systems

Total: 60 Periods

h. Learning Resources

i. Text Books :

1. Andey Lennon “Basics of R/C model Aircraft design” Model airplane news publication
2. Unmanned aircraftsystems uavs design, development **Reg Austin** Aeronautical Consultant