

COURSE CODE	COURSE TITLE	L	T	P	C
1154AE117	AIRPLANE SYSTEMS	2	0	0	2

Course Category:

University elective

a. Preamble:

The course deals with the basic principles and working of various aircraft systems and instruments. The course aims at enhancing the knowledge of students in aircraft system's handling procedures, maintenance practices and technical aspects of various systems.

b. Prerequisite Courses:

Nil

c. Related Courses:

Nil

d. Course Educational Objectives:

- To inculcate the basic knowledge and understanding of various aircraft systems, instruments and their applications.
- To introduce the safety precautions and methodology of handling aircraft 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	Summarize the operations of Hydraulic, Pneumatic and Landing gear systems	K2
CO2	Describe the working principles of control systems in an aircraft	K2
CO3	Illustrate and demonstrate the concepts of starting, ignition, fuel and lubricating systems of typical aircraft power plants and.	K3
CO4	Discuss the ideas of air cycle systems along with fire protection, deicing and anti-icing systems.	K2
CO5	Explain the technical aspects of aircraft instruments and their working principle	K2

f. Course Contents:

UNIT I -AIRPLANE CONTROL SYSTEMS **L 6**

Conventional Systems - fully powered flight controls - Power actuated systems – Auto pilot system - fly by wire systems - Digital Fly by wire system

UNIT II -AIRCRAFT PROTECTION SYSTEMS **L 6**

Fire protection system, Deicing and anti-icing systems - Working principles -Components - Advantages –Applications.

UNIT III -ENGINE SYSTEMS **L 6**

Lubricating systems for piston and jet engines, starting procedures for reciprocating and gas turbine engine aircrafts, Ignition system - components– working principle.

UNIT IV -HUMAN COMFORT SYSTEMS **L 6**

Basic Air cycle systems - Vapor compression and absorption cycle systems, Cabin air pressure system, and Evaporative vapor cycle systems - Evaporative air cycle systems.

UNIT V -AIRCRAFT INSTRUMENTS **L 6**

Flight Instruments and Navigation Instruments – Air speed Indicators: TAS, EAS, IAS, CAS, Vertical speed indicator- Mach Meters –Variometers- Altimeters - Principles and operation - Study of various types of engine instruments - Tachometers - Temperature gauges - Pressure gauges - Operation and Principles- Gyroscope – Accelerometers, ILS.

Total hours = 30

h. Learning Resources

i. Text Books:

1. McKinley, J.L., and Bent, R.D., “Aircraft Maintenance & Repair”, McGraw-Hill, 2013.
2. “General Hand Books of Airframe and Power Plant Mechanics”, U.S. Dept. of Transportation, Federal Aviation Administration, The English Book Store, New Delhi 1995.

ii. References:

1. “Airframe and Power Plant Mechanics: Power plant Handbook” by Federal Aviation Administration, Aircraft Technical Book Company, 2012.
2. Mekinley, J.L. and Bent, R.D., “Aircraft Power Plants”, McGraw-Hill, 1993.
3. Pallet, E.H.J., “Aircraft Instruments & Principles”, Pitman & Co., 1993.
4. Treager, S., “Gas Turbine Technology”, McGraw-Hill, 1997