

COURSE CODE	COURSE TITLE	L	T	P	C
1151AE323	PROPULSION LABORATORY	0	0	2	1

Course Category:

Programmed core

a. Preamble:

This course Propulsion Lab provides an introduction to the basic concepts of assembly and dismantling of piston and gas turbine engines, heat transfer, evaluation of Calorific value of fuels and Velocity evaluation for free and wall jet setup.

b. Prerequisites:

- Thermodynamics Laboratory

c. Links to other courses:

- Nil

d. Course educational objectives:

Students undergoing this course are expected:

- To develop the basic knowledge of the students in gas turbine engine and its assembly and dismantling.
- To develop the basic knowledge of the students in piston engine and its assembly and dismantling.
- To evaluate calorific value of the fuels.
- To characterize the fixed pitch propeller.

e. Course outcomes:

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

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
C01	Illustrate the concept of piston engine and gas turbine engine.	K3,S3
C02	Exhibit the concept of jet characteristics.	K4,S3
C03	Estimate heat transfer coefficient the free and forced convection heat transfer.	K4,S3
C04	Perceive the calorific value of a various fuels.	K4,S3
C05	Manipulate the performance of propeller.	K4,S3

(S1-Factual, S2-Conceptual, S3-Procedural, S4-Metacognitive)

f. Correlation of COs with POs:

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

H- High; M-Medium; L-Low

g. Course contents:

1. Study of an aircraft piston engine (includes study of assembly of sub systems, various components, their functions and operating principles).
2. Study of an aircraft jet engine (includes study of assembly of sub systems, various components, their functions and operating principles).
3. Forced convective heat transfer over a flat plate.
4. Free convective heat transfers over a flat plate
5. Cascade testing of a model of axial compressor blade row.
6. Study of performance of a propeller.
7. Determination of heat of combustion of aviation fuel.
8. Combustion performance studies in a jet engine combustion chamber.
9. Determination of characteristics of free jet.
10. Determination of characteristics of wall jet.

Total Periods: 30