GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM

AIRCRAFT SYSTEM
(Code : 3340104**)**

Diploma Programme in which this course is offered	Semester in which offered
Aeronautical Engineering	Fourth

1. RATIONALE

The main objective of this course is to understand the working of the aircraft systems. This subject addresses the understanding and functioning of hydraulic system and associated parts, the pneumatic system, lubrication system, and the cabin pressurization system.

2. LIST OF COMPETENCIES

The course content should be taught and implemented with a aim to develop different types of skills leading to the achievement of the following competencies:

- → **To know about different system of aircraft.**
- → **To study about details information of hydraulic and lubrication system of an aircraft.**

3. TEACHING AND EXAMINATION SCHEME.

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	**T**	**P**	**C**	**ESE**	**PA**	**ESE**	**PA**	**150**
03	00	02	02	70	30	20	30	

Legends: **L**-Lecture; **T** – Tutorial/Teacher Guided Theory Practice; **P** -Practical; **C** – Credit, **ESE** - End Semester Examination; **PA** - Progressive Assessment.

4. DETAILED COURSE CONTENTS

Unit	Major Learning Topics and Sub-topics	Outcomes (in cognitive domain)
UNIT– I INTRODUCTION	• Classification of aircraft systems.	1.1 Introduction 1.2 Classification of System

UNIT– II **LUBRICATION & COOLING SYSTEM**	• To Study about lubricants & its properties. • To study about lubrication systems. • To study about cooling system of aircrafts.	2.1 Principles of Engine Lubrication 2.2 Types of Friction 2.3 Functions of Engine Oil 2.4 Requirements and Characteristics of Reciprocating Engine Lubricants. 2.5 Reciprocating Engine Lubrication Systems. (Types & Components) 2.6 Requirements for Turbine Engine Lubricants 2.7 Turbine Engine Lubrication Systems. (Types & Components) 2.8 Engine Cooling Systems 2.9 Reciprocating Engine Cooling Systems 2.10 Turbine Engine Cooling
UNIT– III **AIRCRAFT FUEL & IGNITION SYSTEM**	• To study about types of aviation fuels and its properties. • To study about aircraft fuel system and its components. • To about starting & ignition system of aircraft.	3.1 Basic Fuel System Requirements 3.2 Types of Aviation Fuel 3.3 Types fuel Tanks 3.4 Reciprocating Engine Fuel System (Types & Components) 3.5 Turbine Engine Fuel system (Types & Components) 3.6 Reciprocating Engine Ignition Systems 3.7 Turbine Engine Ignition Systems 3.8 Reciprocating Engine Starting Systems 3.9 Turbine Engine Starting Systems
UNIT– IV **HYDRAULIC AND PNEUMATIC POWER SYSTEMS**	• To study about hydraulics fluids and its properties. • To study about hydraulic system and its components. • To study about Pneumatic system and its components.	4.1 Hydraulic Fluid Characteristic 4.2 Types of Hydraulic Fluids 4.3 Basic Hydraulic Systems(Open & Closed Center) 4.4 Large Commercial Aircraft Hydraulic System 4.5 Main Component of Hydraulic System(Reservoir, Pumps, Actuator, Filters & Valves etc..) 4.6 Aircraft Pneumatic Systems & Components
UNIT– V **AIRCRAFT MISCELLANEOUS SYSTEM**	• To study about anti icing & deicing system of aircraft. • To study about fire protection & safety, oxygen & pressurization system of aircraft.	5.1 Ice protection System (anti icing and deicing) 5.2 Engine Fire Protection Systems 5.3 Induction and Exhaust Systems 5.4 Cabin Environmental Control Systems 5.5 Landing Gear System 5.6 Air Conditioning System

5. SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY).

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	INTRODUCTION	02	01	01	02	04
II	LUBRICATION & COOLING SYSTEM	08	04	06	06	16
III	AIRCRAFT FUEL & IGNITION SYSTEM	08	06	04	06	16
IV	HYDRAULIC AND PNEUMATIC POWER SYSTEMS	08	04	06	08	18
V	AIRCRAFT MISCELLANEOUS SYSTEM	08	05	05	06	16
TOTAL		34	20	22	28	70

Legends: R = Remember **U**= Understand; **A**= Apply and above levels (Bloom's revised taxonomy).

6. SUGGESTED LIST OF EXERCISES/PRACTICALS.

The tutorial exercises should be properly designed and implemented with an attempt to develop different types of skills leading to the achievement of the above mentioned competencies.

SR. NO.	UNIT NO.	EXPERIMENT
1	I	Introduction of aircraft systems.
2	II	To study about lubrication system.
3	II	To study about cooling system.
4	III	To study about aircraft fuel & ignition system.
5	IV	To study about hydraulic and pneumatic power systems.
6	V	To study about aircraft miscellaneous system

7. SUGGESTED LIST OF STUDENT ACTIVITIES.

Following is the list of proposed student activities like:

SR.NO.	ACTIVITY
1	Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and experiment work.
2	Prepare a charts & thermocouple model of aircraft system.

8. SUGGESTED LEARNING RESOURCES.

A. List of Books:

SR. NO.	TITLE OF BOOK	AUTHOR	PUBLICATION
1.	Aircraft Systems	Ian Moir, Allan Seabridge	John Wiley & Sons
2.	Aircraft Systems	David Lombardo	McGraw Hill Professional
3.	Aircraft system	Ankit patel	-

B. List of Software/Learning Websites

a. https://www.youtube.com/watch?v=mmmcj53TNic

b. https://www.youtube.com/watch?v=MFHmHlEWn9E

c. https://www.youtube.com/watch?v=AGdsGEcGJM4

d. https://www.youtube.com/watch?v=mUzVxG0fJEs

e. https://www.youtube.com/watch?v=X-RyrejKq4Q

f. https://www.youtube.com/watch?v=NDXUytTOt4w

g. https://www.youtube.com/watch?v=FjVGGbR9sPw

h. https://www.youtube.com/watch?v=W94iksaQwUo

i. https://www.youtube.com/watch?v=OMLSNwQiiKg

j. https://www.youtube.com/watch?v=dwJMJYt1lkM

k. https://www.youtube.com/watch?v=y1AyhVfV3pQ&hd=1

l. https://www.youtube.com/watch?v=1dfMRI2kwfg

m. https://www.youtube.com/watch?v=tjDAjo8CtSU

n. https://www.youtube.com/watch?v=ffP8t7F3l_I

o. https://www.youtube.com/watch?v=AOZgRLj571I&hd=1

p. https://www.youtube.com/watch?v=6jlkn9c2H1Q

q. https://www.youtube.com/watch?v=nERLffiW2d8

r. https://www.youtube.com/watch?v=mP9ZkY-xdYc

s. https://www.youtube.com/watch?v=i9_bzYx-xWk

t https://www.youtube.com/watch?v=qQNg3tH8-zE

u. https://www.youtube.com/watch?v=f3gjAkySZrE

v. https://www.youtube.com/watch?v=URjBufbEpHE

x. https://www.youtube.com/watch?v=KgphO-u7MlQ

y. https://www.youtube.com/watch?v=3NRb84GFqJw

z. https://www.youtube.com/watch?v=dE_LCLxSz2E

9. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnic.

- **PROF.ANKIT PATEL**, H.O.D., Aeronautical Dept. Parul institute of Engg. & tech-Diploma studies

Coordinator and Faculty Members from NITTTR_Bhopal.