University of Management and Technology
Course Outline

Course code: ET 341 Course title: Gas Turbine Engine - I

Program	BSc Aircraft Maintenance Engineering Technology
Credit Hours	03
Duration	16 weeks
Prerequisites	ET234 Piston Engine PH205 Heat and Thermodynamics
Resource Person	Kamran Asim
Counseling Timing (Room# CB1 First Floor)	Tuesday 10:00am to 12:00pm Wednesday 10:00am to 12:00pm Thursday 10:00am to 12:00am
Contact	kamran.asim@umt.edu.pk

Learning Objective:

The course is directed towards the description, performance, classification, and applications of gas turbine engines. For comprehensive analysis and understanding, the course has been divided into two parts: Engine Description & Performance and Engine Classification and systems.

Upon successful completion of the course, the student should be able to:

S No	CLO Statement	PLO	Learning Domain and level
1.	***Explain*** the fundamental principles of mechanics and thermodynamics involved in the processes occurring in gas turbine engines.	1	C2
2.	***Outline*** the construction, operations and features of the components of the gas turbine engines.	1	C4
3.	***Apply*** the obtained knowledge to analyze the performance factors of gas turbine engine components.	3	C3

1. CLO – PLO MAPPING:

CLOs	PLOs											
	Engineering Technology	Problem Analysis	Design / Development of Solutions	Investigation	Modern Tool Usage	The Engineering and Environment	Ethics	Individual and Team Work	Communication	Project Management	Lifelong Learning
	1	2	3	4	5	6	7	8	9	10	11	12
1	**C2**											
2	**C4**											
3			**C3**									

Learning Methodology:

- The course content is designed as a mixture of theory lectures and web tutorials.
- Worked examples involving hands on practice are also designed as part of the course to ensure active participation and consolidate learning.
- Participants will be evaluated based on assignments and quizzes from theory, worked examples and individual/group presentations.

Recommended Text Books:

"Gas Turbine Engine, Cat B1 – Module 15, Part 66 Basic Training" by Aero-Bildung, 2017.

Reference Books:

"Gas Turbine Theory", fifth edition, by HIH Saravanamuttoo, H. Cohen and GFC. Rogers, published by Pearson Education Ltd, 2001.

Calendar of Course Contents to be Covered During Semester

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Week	Course Contents	Reference Chapter(s)	Quiz	Assignments	CLOs
1-2	**15.1 Fundamentals** 15.1.1 Physical basics 15.1.2 Fluids and gases 15.1.3 The thermodynamics of a turbo engine 15.1.4 Constructional Arrangement and Operation of Turbojet, Turbo-fan, Turbo-prop, Turbo-shaft	15.1	1		1
3-4	**15.2 Engine Performance** 15.2.1 Engine thrust 15.2.2 By-Pass Ratio 15.2.3 Propulsive power / thrust horse power 15.2.4 Shaft horse power 15.2.5 Specific Fuel Consumption (SFC) 15.2.6 Engine Efficiencies 15.2.7 Engine Pressure Ratio (EPR) 15.2.8 Pressure, Temperature and Velocity of The Gas Flow 15.2.9 Engine Ratings 15.2.10 Influence of Speed, Altitude, Hot Climate 15.2.11 Flat Rating 15.2.12 Limitations	15.2			
5	**15.3 Inlet** 15.3.1 Inlet Ducts 15.3.2 Turbine Engine Entrance Ducts 15.3.3 Inlet Ice Protection	15.3			

6-7	**15.4 Compressors** 15.4.1 Construction and Operation of Compressors 15.4.2 Centrifugal-Flow Compressor	15.4	2	1	1
7	**15.5 Combustion Section** 15.5.1 Fundamentals of Combustion Chambers	15.3 Online tutorials	1		2
8	Mid Term Examination				
9	**15.6 Turbine Section** 15.6.1 Fundamentals and Types of Turbines	15.6			2
10	**15.7 Exhaust** 15.7.1 Exhaust Systems	15.7	1		2
11	**15.8 Bearings and Seals** 15.8.1 Bearings 15.8.2 Seals	15.8			
12	**15.9 Lubricants and Fuels** 15.9.1 Turbine Engine Lubricants 15.9.2 Turbine Engine Fuels	15.9		1	2

13	**15.10 Lubrication Systems** 15.10.1 Application and Components of Lubrication Systems	15.10	1		
14-15	**15.11 Fuel Systems** 15.11.1 Fuel System Layout and Requirements 15.11.2 Fuel System Description 15.11.3 The hydromechanical metering unit (HMU) 15.11.4 Fuel control 15.11.5 FADEC System	15.11			2
16	**Revision week**				