INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

AIRCRAFT MAINTAINENCE ENGINEERING								
VIII Semester: AE								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
AAED62	**Elective**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	0	-	3	40	60	100
Contact Classes: 48	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 48**		
Prerequisite: Introduction to Aerospace Engineering								

I. COURSE OVERVIEW:

The course provides students with a comprehensive understanding of aircraft systems, maintenance procedures, and industry standards. It covers essential topics such as aircraft structure, powerplant systems, hydraulic and electrical systems, troubleshooting, and maintenance protocols. Students will also learn about safety practices, regulatory frameworks, and quality assurance in aircraft maintenance, including certification processes. Students will gain the skills needed to perform aircraft inspections, repairs, and maintenance tasks while ensuring compliance with international aviation regulations. The course prepares students for careers in aircraft maintenance and further professional certifications in the field.

II.COURSES OBJECTIVES:

The students will try to learn:

I. Understand aircraft structure, systems, and maintenance procedures.
II. Gain knowledge of regulatory and safety standards.
III. Apply maintenance practices, troubleshooting, and diagnostics in aviation.

III.COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO1 Understand the basic structure and key systems of an aircraft.
CO2 Apply aircraft maintenance procedures, operate common maintenance tools and equipment, ensuring efficient and safe aircraft maintenance practices.
CO3 Apply aviation safety protocols, identify potential hazards, and ensuring compliance with safety standards to maintain airworthiness.
CO4 Understand the impact of human factors on aircraft maintenance operations and strategize to minimize human error.
CO5 Understand the regulatory framework governing aircraft maintenance identify key certification processes and ensuring compliance with Airworthiness Directives (ADs) and Service Bulletins (SBs).
CO6 utilize computerized maintenance management systems (CMMS) for scheduling and tracking maintenance activities, ensuring effective planning and management of maintenance tasks.

IV. COURSE CONTENT:

MODULE–I: INTRODUCTION TO AIRCRAFT MAINTENANCE AND SYSTEMS (10)

Aircraft Maintenance Fundamentals: Role of Aircraft Maintenance Engineers, types of maintenance (line vs. base), and maintenance scheduling. Aircraft Structure: Overview of fuselage, wings, empennage, and landing gear. Aircraft Systems Overview: Basics of powerplant systems (engines), flight controls, hydraulics, electrical systems, and environmental systems.

MODULE–II: AIRCRAFT MAINTENANCE PROCEDURES (10)

Maintenance Procedures: Pre-flight inspections, routine/preventive maintenance, troubleshooting, and fault diagnosis. Aircraft Maintenance Manuals (AMMs): Usage for maintenance practices and troubleshooting. Tools and Equipment: Common maintenance tools, diagnostic tools, and special testing equipment.

MODULE–III: AVIATION SAFETY, QUALITY ASSURANCE, AND HUMAN FACTORS (10)

Safety Protocols: Personal, equipment, and aircraft safety in maintenance. Quality Assurance: Documentation, audits, and compliance.
Human Factors: The impact of human error on maintenance and strategies for error management.

MODULE–IV: REGULATORY STANDARDS AND CERTIFICATION (09)

Regulatory Bodies: ICAO, FAA, EASA, DGCA, and their roles in aircraft maintenance. Certification: Maintenance certifications, licenses (e.g., AME licenses), and airworthiness. Compliance: Airworthiness Directives (ADs), Service Bulletins (SBs), and the certification process.

MODULE–V: AIRCRAFT MAINTENANCE DOCUMENTATION AND MANAGEMENT (09)

Maintenance Records: Importance of aircraft logbooks and records in compliance and maintenance history. Maintenance Control Systems: Introduction to computerized maintenance management systems (CMMS), predictive and preventive maintenance scheduling. Project/Assignment: Practical applications of record-keeping, planning, and managing maintenance activities.

V.TEXTBOOKS:

1. Michael Kroes, William W. Watson, and F. Robert Hiner, “Aircraft Maintenance and Repair”
2. “Aviation Maintenance Technician Handbook-Airframe” by FAA
3. Harry A. Kinnison , “Aviation Maintenance Management”

VI.REFERENCEBOOKS:

1. Dave R. J. H. Martin, “Aircraft systems: Mechanical, Electrical and Avionics”.
2. Michael J. Kroes., “Aircraft Inspection and Repair”
3. David M.S. Willams. “Aircraft Maintenance: The Art and the Science”

VII.ELECTRONICSRESOURCES:

1. https://www.easa.europa.eu/en/domains/general-aviation
2. https://www.icao.int/safety/safetymanagement/pages/guidancematerial.aspx

VIII.MATERIALSONLINE:

1. Course template
2. Tutorial question bank
3. Tech talk topics
4. Open end experiments
5. Definitions and terminology
6. Assignments
7. Model question paper – I
8. Model question paper - II

9. Lecture notes
10. E-learning readiness videos (ELRV)
11. Power point presentation